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Editorial

Listening skills for doctors

Doctors spend considerable time in communicating with patients in their clinical practice. Communication with patients is important in history taking, explaining the diagnosis, obtaining informed consent, health education etc. Therefore, good communication skills are of utmost importance to doctors. There are two components in verbal communication; talking and listening. When communicate, one must pay equal attention to both these aspects. Listening skills of doctors are often questioned. Therefore, in this editorial we intend to stress the importance of listening skills for doctors. Listening or **'active listening'** plays a very important role in communication. Active listening is an art that has to be mastered. It involves many aspects such as being attentive during the conversation, ability to get the patient to talk freely, getting clarifications on what the patient said, being reflective of what the patient said, restating and summarising what the patient said from time to time and having the correct body language. Getting clarifications, restating what the patient said and summarising from time to time will make sure that you understand what the patient says correctly.

When obtaining information the doctor can use either open or close ended questions. It is preferable to use open questions (e.g. Can you explain me what happened to you when you took aspirin?) over close ended questions (e.g. Are you allergic to aspirin?). If the patient does not know the meaning of allergy he may say yes to even gastric irritation induced by aspirin whereas if he explains what happened when he took aspirin you may get the correct picture. Open questions tend to yield more information but the patient may consume more time. You may feel that it is not practical to use open questions in a busy clinic or a quick ward round because of the constraints on time. But we must always keep in mind that patients will open up and discuss freely when we ask open questions as opposed to close ended, leading questions. With practice, one can use open questions (together with appropriate use of leading questions) to obtain information from patients without loosing time. Better listening skills of doctors will definitely improve the patient-satisfaction.

Dr. Sampath Gunawardena
Dr. Upeksha Liyanage
Co-Editors

Instructions to Authors

The Galle Medical Journal is published by the Galle Medical Association. The aims of the *Journal* are to foster co-operation among the medical fraternity and to be a forum to make literary contributions, share experiences encountered in medical practice, update their knowledge and have debates on topics related to all aspects of medicine. We will also attempt to cater to the educational needs especially of the postgraduate trainees. The *Journal* publishes original articles, reviews, leading articles and case reports. An article is reviewed for publication on the understanding that the work it report has not been submitted simultaneously to another journal, has not been accepted for publication elsewhere and has not already been published. All manuscripts will be reviewed anonymously before acceptance.

Manuscripts must be submitted with the text typewritten and double spaced. Text and all illustrative material should be submitted in two hard copies **and** the electronic version in a floppy diskette in Microsoft Word document format. To help us to help you and to avoid delay we would be grateful if authors would comply with the following requirements. All manuscripts should accompany a covering letter indicating the number of words in the manuscript and the contact details of the corresponding author.

Types of contributions:

Review articles and Leading Articles - The Editors encourage submission of signed leading articles which are less than 2000 words in length and address topics of current interest. They should be supported by no more than 20 key references. Submissions may be subjected to external review before acceptance.

Original Articles should normally be in the format of introduction, methods, results, discussion.
Each manuscript must have a 200 word structured abstract. The text should be limited to 2000 words and 15 references. Lengthy manuscripts are likely to be returned for shortening. The discussion in particular should be clear and concise and should be limited to matters arising directly from the results. Avoid discursive speculation.
Corresponding authors of original articles should sign the declaration form which can be obtained from the GMA Office or GMA web site (www.ehealth.lk/gma)

Case Reports - These should not exceed 750 words and 5 references; no abstract is required.
Case report should be informative and devoid of irrelevant details.

References:
These should conform to the Vancouver style. The reference in the text should be numbered consecutively in the order in which they appear and first five authors should be listed. If there are more than five then the first three should be listed followed by et al. Examples are given below:

1. De Bolla AR, Obeid ML. Mortality in acute pancreatitis. *British Medical Journal* 1984;**326**:184-6.
2. Calenoff L, Rogers L. Esophageal complication of surgery and lifesaving procedures. In: Meyers M, Ghahremani G, eds. Iatrogenic Gastrointestinal Complications. New York: Springer, 1981:23-63.

Units / Abbreviations
Authors should follow the SI system of units (except for blood pressure which will continue to be expressed in mmHg). Authors should use abbreviations sparingly and they should be used consistently throughout the text.
Manuscripts that do not conform to these requirements will be returned to you for recasting. All submissions should reach the editors **before 15th June 2008.** Manuscripts should be addressed to Editors, Galle Medical Association, Teaching Hospital, Karapitiya, Galle.

Lipid abnormalities in type 2 diabetes mellitus patients in Sri Lanka

Lukshmy Menik Hettihewa[1,3], Sudari Wijewickrama Gunasekera[1], Sudheera Sammanthi Jayasinghe[1], Shalika Palangasinghe[1], Thilak Priyantha Weerarathna[2], Imendra Kotapola[4]

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Abstract

Background & Objective: Previous studies suggest that the prevalence of dyslipidaemia in type 2 diabetes is high with respect to the general population. But data related to the prevalence of dyslipidaemia in diabetic population is limited in Sri Lanka. This study was planned to identify the prevalence of abnormalities in lipid profile among type 2 diabetic population.

Methods: All subjects were studied for their quantitative lipid abnormalities after an overnight fast. Their anthropometric indices were measured and fasting blood sample was collected for glucose and lipids determinations.

Results: Mean value of BMI was 23.67 ± 0.58 kg/m^2 and FBS was 179.3 ± 9.98 mg/dL. There were 67% patients with high TC levels and 44% of patients with high triglyceride levels. Increased LDL levels were found in 51% of patients and 19% of patients had lower HDL levels both in males & females. We found that 65% of patients had more than one risk factor in lipid profiles. Further, 74% of patients had combination of significantly high TC and low HDL levels.

Interpretation & Conclusion: Contrary to the previous research findings, total cholesterol is the most common lipid abnormality in type 2 diabetics. Considering our different prevalence rates of dyslipidaemia among diabetic patients, we strongly suggest to promote investigations related to the effects of abnormalities of total cholesterol on the development of insulin resistance, the major causative factor for type 2 diabetes.

Introduction

The prevalence of type 2 diabetes has reached epidemic proportions in the US and worldwide, and is projected to increase dramatically [1]. Furthermore, the prevalence of insulin resistance, a major causative factor in the early development of type 2 diabetes and an independent risk factor for cardiovascular disease and the metabolic syndrome X, is even more widespread [1]. The prevalence of dyslipidaemia in type 2 diabetes is double with respect to the general population [2]. These are more complex abnormalities that, in general, are caused by the interrelation among obesity, insulin resistance and hyperinsulinism [3-5]. With the treatments and tight glucose controls, blood lipid levels may improve; however, almost never do they reach normal levels. Lipid management in diabetes should begin parallel with the best possible blood glucose control, and if there is obesity, weight loss should be encouraged [5].

The quantitative and qualitative abnormalities of lipids in diabetic patients are numerous. The most common abnormality found in diabetes is high triglycerides (TG) with low high density lipoprotein (HDL); and although if low density lipoprotein (LDL) might not be higher, its metabolism is abnormal [6-8]. At present, there is enough evidence to claim that at least half of type 2 diabetics already present with some form of a macrovascular disease by the time their disease is diagnosed [4-5].

Data related to the prevalence of dyslipidaemia (qualitative lipid analysis) among diabetic patients is limited in Sri Lanka. Because of the numerous variations in quantitative and qualitative abnormalities of lipids in diabetic patients, we conducted this study to analyse the lipid profiles in patients with type 2 diabetes mellitus. Main objective was to find out the prevalence rate and the qualitative analysis of lipid abnormalities among type 2 diabetics in a Sri Lankan population.

Materials and Methods

Selection of patients: Subjects were selected from type 2 diabetic patients that participated in the Hospital medical clinic. 43 patients were selected by convenient sampling irrespective of their treatment strategies for diabetes. Study protocol and objectives of the study were thoroughly explained to them. They were recruited after obtaining the informed written consent. Clinical history was documented and following exclusion criteria were used; age out side the range of 20-65 years, liver, kidney or cardiac failure, neoplasm and patients who are on any type of anti lipidaemic therapy.

Study protocol: The study protocol was reviewed and approved by the Ethics Committee of Faculty of Medicine, University of Ruhuna. Each individual was investigated in our laboratory after an overnight (12-14 h) fast to determine fasting blood sugar, plasma lipids and insulin levels. Their weight and height were also recorded.

Biochemical analysis: The plasma was separated immediately using centrifugation at 4000 rpm for 10 minutes. Fasting blood glucose concentration was assessed by absorbance method (Diagnostica – Merck). Analysis of lipid was done either immediately or during first week after conservation at -20^{0}C. Total cholesterol (TC) and triglyceride (TG) levels were measured enzymatically (LABKIT-P&T Diagnostics, Spain) [3]. HDL cholesterol was measured in the supernatant after lipoprotein containing apolipoprotein B were precipitated by phostungstate/magnesium chloride solution [3]. LDL Cholesterol was calculated by Friedewald formula: LDL-cholesterol = Total cholesterol – (Triglycerides/5) - HDL cholesterol [3]. Serum insulin levels were determined by enzyme linked immunoabsorbent assay (ELISA) using commercial ELISA kits (Diagnostic-Automation) Body mass index (BMI) was calculated using weight and height (kg/m^2).

Statistical Analysis: For the descriptive statistics after having checked the normality of the variables using the Kolmogorov-Smirnov test, the usual central and dispersion methods were used: average, SD, and 95% CI. Power and sample size calculations were carried out based on the results of the current study, comparing changes in FI, IR, BW and BMI in 3 month of PIO allowing declaration of a difference before and after in same treatment group, at a significance level = 0.05, with power of 80%. The statistical significance of differences between the means were evaluated using the paired Student's T-test in the case of normal distribution of data sets, and using the Kolmogorov-Smirnov test when at least in one of the data sets the normal distribution was excluded. Correlation between two variables was studied with the Spearman rank-order. All statistical analyses were performed using Microcal origin 4.1(2005) and Microsoft Excel whenever applicable.

Results

Table 1 shows the baseline values of age, BMI and fasting blood sugar. Age distribution of our study sample was 26 years - 65 years (mean+/-SEM, 46+/-1.5 years). Their mean body mass index was 23.7+/-0.6 kg/m^2 and the mean fasting blood sugar was 179.3+/-10 mg/dL (mean +/-SEM). Figure 1 shows 33% of diabetic patients are within 51 - 60 year of age range and 31% of them are within 41-50 year range. Figure 2 indicates most of our patients are not obese (61%) and the BMI of study group vary from 14.8 - 33.6 kg/m^2.

Table 1 - Anthropometric and metabolic characteristics of patients with type 2 diabetes

Basic characteristics	Mean $\pm$ SEM (n = 43)
Age (years)	44.9 $\pm$ 0.34
BMI (kg/m2)	23.7 $\pm$ 0.58
FBS (mg/dL)	179.3 $\pm$ 9.98

Qualitative and quantitative analysis of lipid profile in our study group is shown in table 2. Total cholesterol, triglycerides, HDL cholesterol and LDL cholesterol were 246.5+/-7.6, 156.3+/-6.2, 57.2+/-1.6, and 157.2+/-7.5 mg/dL respectively (Mean+/-SEM). Total cholesterol to HDL ratio (TC/HDL ratio) was 4.43+/-0.18 (Mean+/-SEM). Prevalence of dyslipidaemia was diagnosed by cut points, mentioned in the diagnostic kit [3] (LABKIT- P&T from Spain).

Hypercholesterolemia was considered when the total cholesterol was ?220 mg/dL and TG & LDL cholesterol levels were considered to be abnormal if they were ≥ 150 mg/dL [3]. HDL cholesterol concentration was considered to be abnormal if it was ?40 mg/dL in males and ≤ 50 mg/dL in females [3]. Total cholesterol/HDL ratio was considered to be as a risk when it is ≥3.8 in males and ≥3.1 in females.

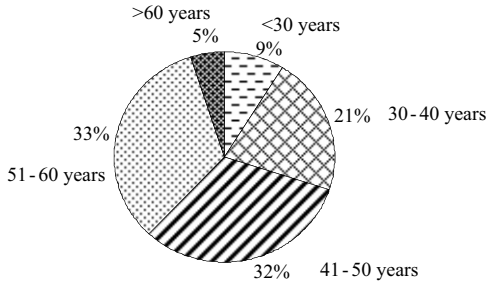

Figure 1 - Age distribution among patients with type 2 diabetes mellitus

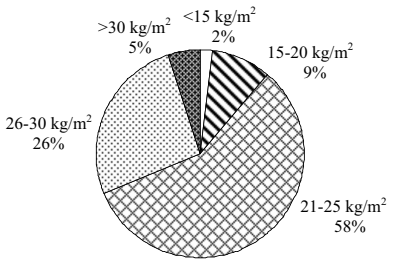

Figure 2 - BMI distribution among patients with type 2 diabetes mellitus

Next, we analysed the prevalence rate of hypercholesterolaemia, hypertriglyceridaemia, low HDL and high low density lipoproteinaemia among our study group. Figure 3 shows that 74% of patients had high TC / HDL ratio and 67% of patients had isolated hypercholesterolaemia in our study group. In addition, 44% of them had hypertriglyceridaemia 19% of patients found to be with abnormally low HDL levels and 51% patients with abnormal LDL levels (Figure 3). In our type 2 diabetic group, the most common abnormality was the high TC / HDL cholesterol ratio. 22 out of 24 females had TC/HDL ratio > 3.1 and 10 males had TC / HDL ratio > 3.8 patients (91% for females, 53% for men and 74% for both genders). We have found that second most common abnormality was isolated hypercholesterolaemia (63% of females, 74% of males and 67% of both genders). Our results further indicate that abnormal LDL cholesterol levels were detected in 47% of men, 54% of women and 51% of both genders. Similarly, hypertriglyceridaemia was found in 37% of men, 50% of women and 44% of both genders. The prevalence of having more than one risk factor in lipid profiles was 65% in our study group (data not shown).

Table 2 - Quantitative and qualitative analysis of lipid profile before the commencement of the treatment. Values expressed as mean and standard error of mean (SEM)

Parameters of lipid profile	Mean ± SEM
Total cholesterol (mg/dL)	246.5 ± 7.6
Triglycerides (mg/dL)	156.3 ± 6.2
HDL cholesterol (mg/dL) female	57.0 ± 2.1
HDL cholesterol (mg/dL) male	57.5 ± 2.5
LDL cholesterol (mg/dL)	157.2 ± 7.5
TC/HDL ratio female	4.3 ± 0.2
TC/HDL ratio male	4.6 ± 0.3

Discussion

Type of dyslipidaemia reported among diabetic population is numerous in different places in world indicating that dyslipidaemia can be influenced by the interaction of genetic and environmental factors [8]. We are in agreement with the previous reports that dyslipidaemia is a common association with type 2 diabetic patients [2, 4]. Though most of diabetic patients are not obese (61%), 75% of them had elevated TC/HDL ratio and 67% of them had isolated hypercholesterolaemia. Addition, 51% of patients had high LDL cholesterol levels (figure 2). According to our results, prevalence of TC/HDL cholesterol ratio was higher in female diabetic patients [9]. The prevalence of the lipid abnormalities reported by Mexican nationwide survey done by Carlos A and Aguilar S. et al [8] is similar to that observed in Turkish [10] and other Asian populations, including Bangladeshi and Pakistani populations [11] had a different view from our results. Their study shows that 54% of the diabetic population had isolated hypertriglyceridaemia [8] and 26% patients with type 2 diabetes mellitus had combination of low HDL cholesterol (<0.9 mmol/l, 35 mg/dl) with hypertriglyceridaemia (≥2.26 mmol/l). We are in agreement with the above report in relation to prevalence rates of isolated hyper-

triglyceridaemia among diabetic population (44% in ours and 54% in Mexican nationwide survey) [8]. They have found out isolated hypertriglyceridaemia (≥ 2.26 mmol/l) is the most common lipid abnormality among diabetic population but in contrary, our results show the most common lipid abnormality is the high TC/HDL ratio (74%). We also found that 67% of patients showing isolated hypercholesterolaemia and 51% of patients having high LDL levels. This observation further confirms that patients with diabetes had co-incidence of several abnormal lipid profiles.

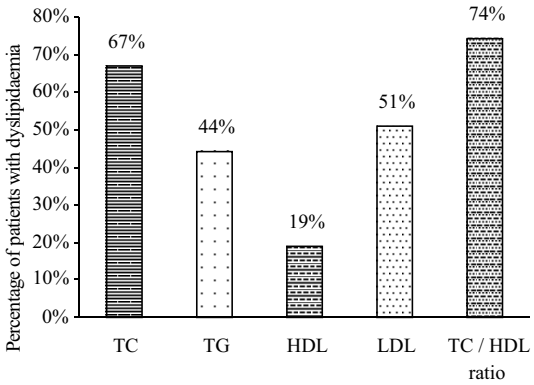

Figure 3 - Percentage of patients with abnormal lipid profiles

In conclusion, our data show that the most common abnormal lipid profile among type 2 diabetic patients is hypercholesterolaemia, confirmed by high prevalence rate of total cholesterol/HDL ratio (74%) and isolated hypercholesterolaemia (67%). We have recently found out that there is a significant genetic association between development of insulin resistance and total cholesterol levels among type 2 diabetic patients [12]. It further confirms that total cholesterol could have impact on the development of insulin resistance in type 2 diabetes mellitus. Considering all the finding in our previous and current studies, we strongly think in investigating the possible metabolic association of between insulin resistance and abnormal levels in cholesterol in type 2 diabetic patients.

Acknowledgements

We gratefully acknowledge Mrs. N. Samaranayaka and Mrs. A.G. Punyalatha in the Department of Pharmacology, Faculty of Medicine University of Ruhuna for their assistance with laboratory analysis.

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Biofeedback therapy in the treatment of pelvic floor outlet obstruction

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Abstract

Introduction: Biofeedback treatment in coloproctology refers to a non-invasive method of cognitively retraining the anal sphincter and the pelvic floor muscles in which the patients are guided by the electromyographic (EMG) activity or the pressure (strength of contraction) of the contracting muscles. In coloproctology, biofeedback therapy has been tried both in the management of chronic constipation due to pelvic floor outlet obstruction (PFOO) and faecal incontinence, with mixed results.

Materials and methods: From June 1999 up to October 2004, 29 female patients underwent biofeedback therapy for PFOO using an anal pressure sensor probe. The results of biofeedback were graded according to the degree of improvement of symptoms ranging from cure to no improvement (i.e. cure, mild, moderate or significant improvement or no improvement). Repeat biofeedback and anal surface EMG were carried out to confirm improvement or failure.

Results: A total of 29 female patients underwent biofeedback therapy. Mean age was 25.5 years (range, 19-36 years). Eleven patients (37.9%) did not complete the course. Of the 18 patients who completed the course, all reported varying degrees of relief indicating an overall success rate of 62.1%. This included significant improvement of symptoms in 8 (27.6%), moderate improvement in 8 (27.6%), and a cure in 2 (6.9%) patients.

Conclusions: Biofeedback therapy gives successful outcome in the majority of patients suffering from PFOO, but needs motivation and strict follow-up to prevent non-compliance.

Introduction

The term biofeedback describes a therapeutic technique where a subject learns to modify or control a physiological function of the body. The basis of biofeedback is learning through reinforcement. This type of learning is also sometimes called instrumental learning or operant conditioning [1].

With the invention of new diagnostic tests, more and more pathophysiological disorders of the pelvic floor are now being recognised. Pelvic floor outlet obstruction (PFOO) is a rare cause of chronic constipation where during defaecation the patient contracts the puborectalis muscle (instead of relaxing) leading to an increase in the anorectal angle, thereby preventing rectal evacuation (obstructive constipation). In chronic constipation due to PFOO (also known as anismus, pelvic floor dyssynergia, spastic pelvic floor syndrome, paradoxical puborectalis contraction and puborectalis syndrome) biofeedback is carried out to teach the patient to relax (instead of contracting) the external anal sphincter and the puborectalis during defaecation [2].

Materials and methods

From June 1999 up to October 2004, 29 female patients underwent biofeedback therapy for pelvic floor outlet obstruction (PFOO) using an anal pressure sensor probe (Figure-1). The diagnosis of PFOO in all the patients was confirmed by anal surface electromyography (EMG) and defaecation proctography (video floroscopy of a defaecating barium enema).

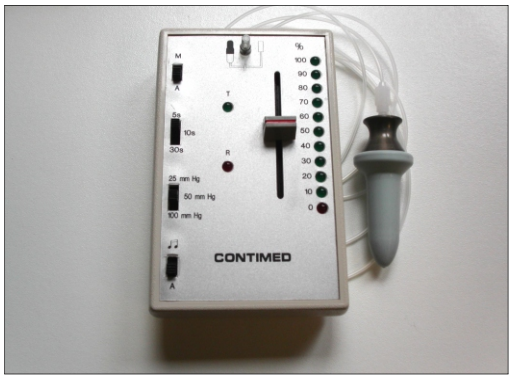

Figure 1 – Contimed biofeedback device with anal pressure sensor

All the patients were also subjected to a psychological evaluation to exclude depression and behavioural disorders. Anorectal physiology studies and volumetry were carried out to exclude Hirschsprung's disease and sphincter abnormalities that may give rise to similar symptoms. Colon transit studies and the endocrine profile were performed to exclude transit abnormalities. Barium enema was carried out to exclude megacolon/rectum and rectocele that may mimic PFOO.

The results of biofeedback were graded according to the degree of improvement of symptoms ranging from, cure to no improvement (i.e. cure, mild, moderate or significant improvement or no improvement). Once the biofeedback therapy course was completed, each patient was examined in the physiology laboratory with a repeat biofeedback (by the clinical physiologist) and anal surface EMG to comfirm improvement or failiure.

Each patient was requested to commit themselves to an eight week period of therapy and to use the biofeedback device (Contimed Device, Neen Healthcare, Dereham, Norfolk, UK – (Figure-1), preferably every day. They were requested to attend the hospital for approximately one hour at the start of their biofeedback course. Once they attended their first session, they were briefed about the device and were shown how to operate it properly. The patients were also given an instruction manual and were taken through the manual with particular emphasis on the need to proceed at a pace appropriate for them. Once the patient had learnt the correct procedure the patient was sent home with instructions on how to contact the hospital if necessary.

Results

Eleven patients (37.9%) did not complete the course. Mean age was 25.5 years (range, 19-36years). Biofeedback treatment was considered successful when the patient was able to reduce the electrical activity of the pelvic floor during straining to defaecate. Of the 18 patients who completed the course, all reported varying degrees of relief indicating an overall success rate of 62.1%. This included significant improvement of symptoms in 8 (27.6%), moderate improvement in 8 (27.6%), and a cure in 2 (6.9%) patients.

Discussion

Biofeedback treatment in coloproctology refers to a non-invasive method of cognitively retraining the anal sphincter and the pelvic floor muscles in which the patients are guided by the electromyographic (EMG) activity or the pressure (strength of contraction) of the contracting muscles. In 1967, Haskell and Rovner demonstrated that patients could utilise the auditory display of needle EMG activity of the external anal sphincter during clinical investigation to improve control over external anal sphincter function [3]. However, due to the discomfort of this procedure, this technique did not gain popularity until it was replaced by transcutaneous EMG recording, first reported by Macleod in 1979. First documented case of biofeedback training of pelvic floor was a case report by Kohlenberg in 1973 [4] . He reported a successful outcome of biofeedback therapy in a case of a 13 year old boy who developed faecal incontinence following surgery for Hirschsprung's disease. Using a 3cm balloon he taught the subject to increase the anal pressure, and reported an increase in the resting anal pressure.

In coloproctology, biofeedback therapy has been tried both in the management of faecal incontinence and chronic constipation due to PFOO with mixed results [5] . The patients in our study were instructed to synchronise voluntary contractions and relaxations with electrically applied stimuli to the muscle and to perform home exercises. In the past, these exercises were carried out as regular clinic sessions under the supervision of a clinical physiologist but now home exercise programmes have been devised and the patients can be initially shown how to carryout the procedure correctly at the clinic and subsequent clinic visits are only used to monitor the progress of therapy. This has greatly helped to cut down on hospital costs but needs more patient compliance to achieve success as non-compliance is a major drawback, as seen in our study (37.9%). Therefore, unless the patients are well motivated home exercise programmes are likely to fail.

A substantial number of these patients with PFOO will be on expensive long-term laxatives and will ultimately be re-referred for further investigations resulting in major expenditure to the health system. Therefore, biofeedback may be the treatment of choice for this rare group of patients as all other treatment procedures such as surgery (i.e. anorectal myectomy, puborectalis muscle incision) and even injection of botulinum toxin have been found to be ineffective [6-8] .

Our biofeedback programme has not shown adequate patient compliance, as over one third (37.9%) of the recruited patients defaulted. The possible reason may be the reluctance by the patients to carryout biofeedback as a home based treatment programme, either due to lack of privacy or due to heavy occupational commitments. Therefore, if a successful biofeedback programme is to be implemented, despite the costs involved, a hospital based treatment programme may be the only option.

Conclusion

Therefore, in conclusion, we wish to state that biofeedback therapy gives successful outcome in the majority of patients suffering PFOO. However, to obtain optimum results of biofeedback, it should be carried out on well motivated patients and in addition, needs a strict follow-up protocol to prevent non-compliance.

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Geometric anatomy of the aortic- common iliac bifurcation

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Abstract

The anatomical description of the aortic common iliac region is well known. However, the geometric measurements of this region are not properly established. The research performed on haemodynamic forces and their correlation with atherosclerosis has shown the importance of the geometric anatomy of this region. Only a few studies have been performed in the western world. According to our knowledge, there are no geometric measurements done in Asian population. Therefore, we decided to embark on a preliminary research project on this particular subject using eleven cadavers. This study was designed to seek any apparent asymmetry at the aorto-iliac bifurcation. Measurements were made on 5 female and 6 male cadavers. In majority of female subjects (4/5) there was an asymmetrical right lateral orientation of the abdominal aorta which resulted in a longer left common iliac artery, smaller right common iliac take-off angle and larger right radius of curvature at the aortic-common iliac bifurcation. In male subjects there were more variety in orientation of the abdominal aorta (3 out of 6 had asymmetrical left lateral orientation of the abdominal aorta). Knowledge of both the exact and the average numerical values associated with the local geometry would be essential for a detailed haemodynamic study of the effect of these variations on atherogenesis and it should be further evaluated.

Introduction

The anatomical description of the aortic common iliac region is well known and is available in any standard anatomy textbook [1]. However, the geometric measurements of this region are not properly established. There are only few studies which have been performed in the western world [2]. According to our knowledge there are no geometric measurements done in the Asian population. One can hypothesize that there may be a difference in these measurements between Asian population and western population. Therefore, we decided to embark on a preliminary research project on this subject. The data may be useful in the fields of Medicine, Surgery and Forensic Medicine [3]. Many clinical observations of different degrees of atheromatous involvement of the right and left iliac arteries in patients with symptomatic aorto-iliac occlusive disease have been done by many researchers [3].

Materials and methods

Nine parameters of eleven cadavers were selected for this study. Six of them were geometric parameters related to that particular area. Techniques were also devised to ascertain the geometric parameters (Figures 1, 2). Outside calipers, scales in centimeters, two transparent protractors were used to obtain the measurements. These measurements were performed on cadavers at the anatomy dissecting theater without mobilization of the aortic-common iliac segment. Therefore, the geometric orientation was not altered from its in vivo state. The cadavers have been placed in supine position and the aortic-common iliac segment was dissected.

The following parameters were studied (Figures 1, 2).

1. Age
2. Sex

3. Cause of death
4. The radius of curvature of the right and left aortic-iliac osculating circles at the bifurcation (R_R and R_L). The osculating circle is the circle in the limiting position of the circle tangent, and therefore, having the highest degree of contact, with a three-dimensional space curve. (Figure 1)
5. Take-off angle of the right and left iliac arteries at the bifurcation.(α_R and α_L)
6. Length of both common iliac arteries.(L_R and L_L)
7. Diameter of the aorta just proximal to the bifurcation (D_A)
8. Diameter of both common iliac arteries just distal to the bifurcation (D_R and D_L).
9. The angle between the aortic longitudinal centre line axis and the plane formed by both iliac arteries (θ). (Figure 2)

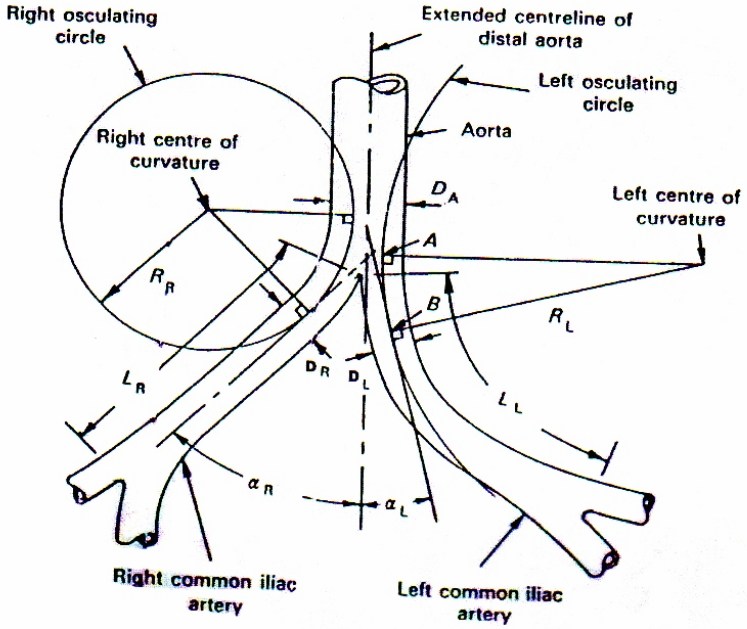

Fig. 1. Anatomical geometry of aortic–common iliac bifurcation.

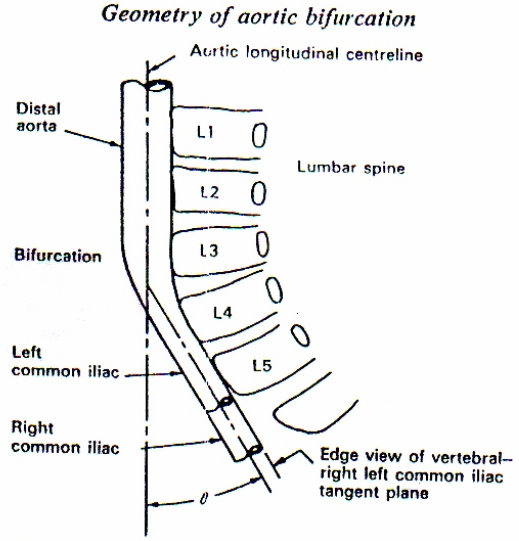

Fig. 2. Section of aortic–common iliac bifurcation through mid-sagittal plane.

For the convenience of measuring above angles, a midline was drawn along the distal aorta and both common iliac arteries. These lines were extended over the aorta to intersect the aortic centerline. The age, sex and cause of death were obtained from the department of anatomy cadaver reports.

Two points (A and B) on each of the imaginary curves at both iliac arteries near the aorto-iliac bifurcation were selected. Then two transparent rulers were placed at the tangent of the circle at points A and B and the radius of curvature was determined as the distance from the tube arc centre line to the intersection of the two rulers. According to that the radius of the curvature of the right and left osculating circles at the bifurcation (R_R and R_L) (Figure 1) was measured.

The angle formed by the intersection of the centerline of the proximal iliac artery B and the extended centerline of the distal aorta is considered as the take off angle. So there are two angles as right and left (α_R and α_L). These were measured directly with a protractor. Either of these angles can become zero when the centerlines of both the aorta and either of the common iliac arteries run parallel to each other.

The (θ) is the angle formed by the aortic longitudinal axis and the plane of both common iliac arteries (Figure 3). It was measured with two transparent rulers. One was aligned parallel to the aortic longitudinal axis and the second was set in the mean plane tangent to both common iliac arteries. These were fixed at the intersection of the two axes and the acute angle (θ) was measured with the protractor.

The length of the common iliac arteries (L_R and L_L) was determined by mobilization and using inside calipers in the segment between the aorta and the common iliac bifurcation.

The diameters of the aorta just before the bifurcation (D_A) and of the iliac arteries (D_R and D_L) immediately after the bifurcation were measured by outside calipers.

All measurements were taken by two independent researchers. Appropriate tests were performed to check for inter-observer differences. In unaffected arteries the thickness of the wall was found to vary between 1 and 2 mm. Possible experimental error was kept to a minimum through the use of precision measuring instruments and is estimated at 5%.

Results

Measurements were obtained in 11 cadavers of which six were male and five were female. The age range was from 64 to 92 years. The average age of males was 77 years and females was 87 years, with the standard deviation being 10 and 6 years, respectively. The above mentioned parameters are tabulated in Tables 1 and 2. In females, the average values of the aorto-iliac take-off angle α_R and α_L were 7.18 degree and 14.58 degree respectively. In males the average values of the aorto-iliac take-off angle α_R and α_L were 16.67 degree and 13.16 degree respectively**.** In females the average values of curvature (k = 1/R) K_R and K_L were 0.19cm and 0.0958cm, respectively. In males the average values of the curvature (k = 1/R) K_R and K_L were 0.205cm and 0.35cm, respectively. In females the average values of the radius of curvature R_R and R_L were α and 5.7cm. In males the average values of the radius of curvature R_R and R_L were 6.76cm and 4.35cm, respectively. The average values of the angle were calculated. They were 23.2 degree and 22.67 degree respectively. All these were tabulated in Table 3 along with the standard deviation, except for the radius of curvature. As will be mentioned in the discussion, the possible haemodynamic correlation to atherosclerosis may be proportional to the curvature k = 1/R, where R is the radius of curvature. It is not statistically relevant to average the radius of curvature R, as the haemodynamic correlation depends on this quantity in a non-linear way and averaging is a linear process. Also note that some of the radii of curvature are infinite and the average of a set of data containing even one infinite radius of curvature would be infinity, whereas the average of the curvature data is always finite since the reciprocal of infinity is zero. Hence, the average radius of curvature was computed as the reciprocal of the average curvature k. The most significant finding is that the ratio of left to right effective average radius of curvature in males is 0.676 versus 0 for females.

Discussion

Although there is lack of agreement about the role of haemodynamic forces in atherosclerosis, such forces may well influence the constitution of atheroma and its localization. If the biochemical and genetic factors have a uniform effect on the arterial system, then the local variation in haemodynamics between the two iliac arteries may be decisive. Anatomical distinctions between the iliac arteries at the bifurcation are not usually made. However, according to Shah Scarton study the aorta at its bifurcation lies to the left of the sagittal plane midline, with the result that the right iliac artery makes a wider take-off angle, and consequently must be longer, in order to reach the right side. But this present study shows that the previous findings are only compatible with males. In the female subjects the aorta at its bifurcation lies to the right of the sagittal plane midline and the left iliac artery is longer and makes a wider take-off angle. Differences in the angle of bifurcation may directly affect the radius of curvature of imaginary osculating circles.

Table 1 - Aortic-common iliac geometric values (females)

	Length of Common iliac L(cm)		Diameter of iliac at bifurcation D (cm)		Radius of curvature A. I Junction (cm)		Take off angle of common iliac α(deg)		Diameter of Distal aorta	θ		
Case	R	L	R	L	R	L	R	L	D_A(cm)	(deg)	Age	Cause of death
F-1	5.5	4	0.9	1	2	3	15	36	1.4	20	86	Unknown
F-2	3.4	5.6	0.7	0.9	7.7	9	27	0	1.3	53	98	MI
F-3	6.5	7	0.9	0.7	7	3.5	10	26	1.5	12	85	Stroke
F-4	6	6.5	0.78	0.8	α	5.5	14	35	1.37	12	85	Ca Colon
F-5	1.5	3.5	0.79	0.65	5.5	7.5	24	27	1.2	19	82	BA

Ca = carcinoma. MI = myocardial infarction. BA = Bronchial asthma.

Table 2 - Aortic-common iliac geometric values (males)

	Length of Common iliac L(cm)		Diameter of iliac at bifurcation D (cm)		Radius of curvature A. I Junction (cm)		Take off angle of common iliac α(deg)		Diameter of Distal aorta	θ		
Case	R	L	R	L	R	L	R	L	D_A(cm)	(deg)	Age	Cause of death
M-1	7.5	6.5	1.2	1.4	7	9	20	15	2.1	20	74	MI
M-2	3.2	6.5	1.15	0.96	2.1	1.2	35	23	1.21	20	81	Stroke
M-3	8	6	1.1	1.1	8	5	12	11	1.9	25	95	Ca oesophagus
M-4	4.3	5.1	0.9	0.91	4	3.5	15	16	1.7	22	64	BA
M-5	4	4.5	1.2	0.9	6	1.9	9	6	1.8	28	72	Ca stomach
M-6	9.5	8	0.95	1	13.5	5.5	9	8	1.55	21	76	MI

Ca = carcinoma. MI= myocardial infarction. BA = Bronchial asthma.

Table 3 - Average aorto-common iliac geometric values
The standard deviation is shown in parentheses

	α_L (deg)	α_L (deg)	K_R (1/cm)	R_R (cm)	K_L (1/cm)	R_L (cm)	θ (deg)
Female	7.18 (18)	14.58 (24.8)	0.19 (0.18)	α	0.0958 (0.20)	5.7	23.2 (17.07)
Male	16.67 (9.89)	13.16 (6.17)	0.205 (0.146)	6.76	0.35 (0.2725)	4.35	22.67 (3.2)

Our results show differences of angle at the bifurcation and radii of curvature of imaginary osculating circles. If the average velocity of the blood flow is the same in both iliac arteries, then the difference in radii of curvature will result in varying centripetal acceleration in each of them. This in turn will affect the amount of secondary flow and shear stress in the corresponding artery.

The significance of the angle in relation to atherogenesis is not clear and has not been studied haemodynamically. However, it does give the idea of the plane of aortic-iliac bifurcation, and will no doubt alter the plane of symmetry of these and any other flow patterns. Relatively weaker secondary flows may also be produced due to this curvature effect. Our series point out that there are significant geometric differences between the two common iliac arteries at the aortic bifurcation which must alter local haemodynamics and hence the predilection of atherogenesis to certain sites. These are especially severe in males owing to the greater differences in male pelvic geometry as compared to females. Finally, our recommendation is that proper assessment of the haemodynamics requires a much higher precision measurement of the local geometry than that derived from casual observation of the bilateral asymmetry and the sex differences.

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Health and health behaviour among late adolescents in Southern Sri Lanka

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Abstract

Objectives: To present the rationale and design of the *Southern Province A-level School Health Survey*, to identify health status and health behaviour patterns, and to examine gender differences in these factors, among late adolescent school children in Southern Sri Lanka.

Methods: A self-administered, anonymous questionnaire was used to obtain information on demographics, perceived health status, psychological well-being, substance use, physical activity, school violence, and sexual health. A two-stage cluster sampling method was used to select students from the three districts in the Southern Province.

Results: A total of 908 females and 903 males participated in the study. The majority (about 98%) was aged 18 years and 99% were Sinhalese. Over 80% of both male and female participants reported self-perceived physical and mental health as "very good" or "good." Nearly 50% of both male and female respondents had experienced severe or moderate psychological distress in the 30-day period preceding the survey. Males were more likely to report substance use than females (Alcohol use: 10.5% verses 1.8%; Smoking: 5.1% verses <1%; Illegal drug use: 1.5% verses <1%). No gender difference was found in level of physical activity. About 64% of the males and 62% of the females were underweight. Males were more likely than females to be involved in violent activities at school (60.1% verses 46.8%). About 7% of male and 6% of female students reported having had some form of heterosexual experience in the previous year.

Conclusions: In general, health status of this student population is good. Malnutrition, sexual and mental health issues, and issues relating to violence, however, require closer attention. Further, longitudinal and qualitative research is needed to identify causal factors associated with the unhealthy behavior patterns identified among these late adolescents.

Introduction

Although relatively healthy compared to other age groups, adolescents are vulnerable to a number of physical and mental health problems [1, 2]. Chronic, as well as, acute health conditions such as diabetes, heart disease, depression, injuries, and sexually transmitted diseases are increasingly prevalent, and recognized, in adolescents [1-4]. However, mental health problems of adolescents are often neglected or not given adequate attention by medical practitioners or by health and education authorities because adolescents are generally considered less likely to develop psychological problems [3, 5]. In Sri Lanka, adolescents are facing a series of health challenges rooted in the environmental and political problems and in the economic and social disparities seen in the country [4-6]. A paucity of epidemiological health related data on adolescents in the country has further impeded the development and implementation of health promotion activities targeted at this age group [4, 5]. Thus, there is a need to conduct micro and macro level epidemiological studies on adolescents to fill this lacuna.

A survey was conducted by the Duke-Ruhuna collaborative research center at the Faculty of Medicine, University of Ruhuna, Galle to explore health and health behavior patterns in advanced level students in Southern Sri Lanka. The objective of this paper is to provide an overview of this school health survey, to present key indicators of health and health behavior among older adolescents in the area, and to evaluate whether there are important differences among males and females regarding these indicators.

Materials and Methods

Study population and sample

The target population for the survey was older adolescents in the three districts in the Southern Province. The random study sample was drawn from advanced level students from all public schools (single sex as well as mixed schools) in the province. A cluster sampling method was used to select the participants [7]. Within the sampled schools, all A-level classes (grade 11 and 12) were selected in the case of smaller schools; in larger schools, a maximum of 7 classes were sampled. All students in the sampled classes were invited to take part in the survey.

Questionnaire and items

A questionnaire, consisting of 138 items, was developed using common questions from other similar surveys or validated scales. Demographic data including sex, age, religion, ethnicity, height and weight, and substance use, physical and leisure time activities, sexual behavior, food habits, involvement in violent behavior in school and psychological and physical health of the participants constituted the components of the questionnaire. The General Well-Being Schedule (GWBS) was used to measure the level of distress among participants [8]. Internal consistency and reliability of the scale was determined using the alpha coefficient, which was 0.76 for the GWBS scale. Three population health researchers confirmed the face validity of the entire questionnaire. The questionnaire was pilot tested on 40 students not part of the main study. It took approximately 45 minutes to complete the questionnaire. The questionnaire was first developed in English, translated to Sinhala and finally back translated to English. Only the Sinhala version was administered to the students.

The questionnaires were introduced and distributed by a group of 12 trained research assistants who were either science or arts degree graduates. The respondents themselves completed the questionnaires during normal class period.

No personal identifiers were collected. Ethical approval for the survey was obtained from the Ethics Review Committee, Faculty of Medicine, Galle and from the Institutional Review Board, Duke University Medical Center, USA. Permission to conduct the survey in the selected schools was obtained from the Provincial Director of Education, Southern Province and from the Principals in each selected school. Data entry was completed using Microsoft Excel. Statistical Package for Social Sciences (SPSS) was used for data analysis.

Results

A total of 1936 students participated in the study. After cleaning and consistency-checking of the data set, analyses were completed using 1811 [female: 908 (50.1%) and male: 903 (49.9%)] students. Ninety eight percent (n = 1778) of the students were aged 18 years. Nearly 98% of the participants were Sinhala-Buddhists. Families of the respondents were categorized into three income groups: low (monthly income less than or equal to Rs. 5,000), middle (monthly income Rs. 5,001 - Rs. 30,000) and upper (monthly income greater than Rs.30,000). Of the students 65.5% were from the middle income families followed by low income (25.5%) and upper income families (9%).

The different health and health behavior indicators are presented and compared by gender, using student's t-test for continuous variables and chi-square test for categorical variables (Table 1).

Table 1 - Health indicator by Gender (N = 1811)

Variable	Gender		Significance
	Female (n= 908)*	Male (n=903)*	
Perceived Physical Health			
Very Good or Good	76.5%	79.0%	*P=0.213*
Moderate or poor	23.5%	21.0%	
Perceived Psychological Health			
Very Good or Good	78.0%	80.2%	*P=0.251*
Moderate or poor	22.0%	19.8%	
Distress			
Severe or moderate	55.1%	53.8%	*p=0.576*
Positive well being	44.9%	46.2%	
Body Mass Index (BMI) (mean)	18.17 (*SD*=3.1)	18.27 (*SD*=3.5)	*P=0.544*
Weight			
Underweight	61.6%	63.9%	
Overweight or Obese	3.1%	4.7%	*P=0.120*
Normal weight	35.3%	31.4%	
Rigorous Exercise (last week)			
1 day or None	14.7%	17.1%	*P=0.162*
2 or more days	85.3%	82.9%	
Watching TV (during a normal school day)			
Less than 2 hours	51.3%	40.8%	*p < 0.001*
2 hours or more	48.7%	59.2%	
Smoking			
Life time	2.2%	27.1%	*p < 0.001*
Monthly	< 1%	5.1%	*p < 0.001*
Alcohol use			
Life time	12.7%	37.1%	*p < 00.01*
Monthly	1.8%	10.5%	*p < 0.001*
Illegal drug use			
Life time	1.6%	9.5%	*p < 0.001*
Monthly	< 0.1%	1.5%	*p < 0.024*
Involved in heterosexual activity (last year)	5.6%	6.6%	*P=0.367*
Involved in homosexual activity (last year)	< 1%	5.7%	*p < 0.001*
Experienced violent activities at school	46.8%	60.1%	*p < 0.001*
Mean number of days absent from school (past month)	2.5 (*SD*= 3.38)	3.0 (*SD*=4.12)	*p < 0.015*

* Percentages were calculated by omitting non-responses.

A similar percentage of both male students (79%) and female (76.5%) students reported perceived physical health as "good" or "very good", and the corresponding figures for self-perceived psychological health were 78% and 80.2% respectively. However, approximately 55% of both male and female students had experienced moderate or severe distress during the 30-day period preceding the survey. The majority (about 62% of both male and female respondents) were underweight (Body Mass Index <18.5) and about 4% were over-weight or obese (Body Mass Index > 25). Over 80% of both male and female respondents had engaged in rigorous physical activity (i.e., physical activity for at least 20 minutes that made the student sweat and breathe hard) at least two days in the 7 days preceding the survey. More male respondents (59.2%) compared to female respondents (48.7%) reported that they had watched TV two or more hours in a normal school day. Male students were more likely than their female counterparts to report having used tobacco products, alcohol and illegal drugs. About 6% of both male and female respondents reported having been involved in some form of sexual activity with an opposite sex partner/s in the 12 months preceding the survey. Significantly higher percentage of male

respondents (5.7%) compared to female respondents (< 1%) reported having been involved in some form of sexual activity with a same sex partner/s in the 12 months preceding the survey. Significantly higher proportion of male participants (60.1%) compared to female participants (46.8%) reported that they had experienced verbal or physical violence on the school property at least once in the previous 12 months. There was a significant gender difference in mean number of days absent from school due to any illness or sickness: 2.5 for females and 3 for males.

Discussion

The overall health status of this adolescent population is good. Similarly, the health behavior patterns reported are positive. However, there are several areas in need of attention from health providers and teachers as well as health and education authorities in the country.

As have been highlighted by others [9, 10], distress levels among late adolescents in Sri Lanka are relatively high compared to other adolescent and young age groups in the world. Students experience a number of stressful events in their home and school environments that may predispose them to the development of depression and other psychological disorders. Risk and protective factors of adolescent stress should be identified and more attention should be directed towards improving the psychological health of adolescents.

The proportion of underweight students observed in this sample may indicate the need of further study to distinguish between those students who may be just 'skinny' and those who may be malnourished. Interventions in improving food habits among students should be considered. Poverty, poor eating habits and lack of knowledge of a healthy diet may be the major contributing factors for malnutrition and obesity among adolescents, as has been reported elsewhere [1, 3].

As expected, alcohol, tobacco, and illegal drug use was more prevalent among male students [9, 11]. Although the consumption rates are lower than rates found in developed countries, socio-cultural changes occurring in the country, with an increasing number of adolescents adapting a westernized life-style, substance use prevention programs should target not only adolescents but also very young children to challenge any positive social image such unhealthy habits may have.

Recent studies carried out in Sri Lanka indicate that attitudes and practices of adolescents relating to sex have changed greatly in recent years [12-13]. Many male adolescents in Sri Lanka have easy access to pornographic publications or adult sites in the internet. Results of this study have shown that a considerable proportion of both male and female students have had sexual experiences with others. Cultural taboos restrict adolescents from getting proper and detailed information about sexual health, and with limited access to buying condoms, a substantial number of adolescents may be at risk of contracting sexually transmitted diseases or end up with unwanted pregnancies. School counseling services need to be expanded by providing services of trained counselors for public schools.

Another area in need of attention is violent behavior in schools. There is a connection between exposure to violence in the media and subsequent violent behavior in the school [14]. Most adolescents in the country have little or no restrictions in watching TV programs that they prefer. The results of this survey indicated that a substantial proportion of adolescents have been watching TV for two or more hours per day. Therefore, it is probable that there is a cause-effect relationship between exposure to TV and violent behavior in schools with respect to this study population. De Silva and Jayasinghe reported that physical punishment by teachers appears to be still a common feature in Sri Lankan schools [15]. Involvement in or witnessing physical or verbal violent incidents in any form may adversely affect the psychological health of students. Results of this study have shown that a considerable proportion of students were exposed to verbal or physical violent incidents on school premises. This area needs further research to identify causative factors of

school violence and interventions are needed to reverse this trend.

Males were more likely than females to be absent from attending school classes due to illnesses or sicknesses. Type of illnesses and injuries that prevent student from attending school classes regularly needs to be identified.

There are several limitations in this study. All information in this study was obtained via self-report and the sensitive nature of some of the questions may have resulted in inaccurate responses or underestimates of some of the prevalence figures. However, the anonymous nature of the survey should minimize underreporting bias. In some schools areas, instead of attending classes in the regular schools, students tend to attend private tuition classes because of the shortage of teachers in the regular schools. Thus, we were not able to survey all students in some selected schools – the absent students might have shown different health and health behavior patterns than those surveyed. Further we cannot generalize these results to all late adolescents: adolescents no longer in schools were not included in study sample and are also likely to have different health behavior patterns from those included. However, the large number of students from several schools in the three districts in the southern province indicates that these findings are valid and generalizable to all A-level students in this area.

In conclusion, late adolescent school children in the Southern Province appear healthy and experience a relatively healthy life style compared to many other late adolescent groups across the world. However, potential malnutrition, mental problems and violent behaviors were identified as important health issues in need of urgent attention.

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Correlation between BMI and insulin resistance in type 2 diabetes mellitus patients on pioglitazone treatment

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Abstract

We investigated the kinetic effect of pioglitazone on changes of body mass index (BMI), body weight (BW), lipids and insulin resistance (IR) in patients with type 2 diabetes mellitus.

Materials and method: 24 patients with type 2 diabetes were randomly selected using fasting blood glucose (FBS) > 7 mmol/L (126 mg/dL) in one occasion if the patient is symptomatic, or in two occasions if the patient is asymptomatic. Patients were treated with 15 mg of pioglitazone (PIO) daily and investigated for BW, BMI, FBS, fasting insulin (FI) & triglycerides (TG). IR was calculated by McAuley (McA), HOMA & QUICKI indices at baseline and repeated after 3 months.

Results: Mean age was 45.83 1.82 years. There was no significant difference of BMI (23.95 0.82 kg/m^2 to 24.08 0.85 kg/m^2), BW (58.78 2.00 kg to 59.08 2.00 kg) and TG (1.82 0.08 mmol/L to 1.7 0.05 mmol/L) after 3 months (mean SE, $p>0.05$). There was a significant reduction in FI (37.58 6.09 to 15.37 3.28 mU/L) and IR by McA (4.68 0.25 to 6.18 0.31) with PIO treatment ($p<0.001$). Reduction of IR by HOMA and QUICKI indices were also significant (17.51 3.36 to 5.41 1.57 and 0.27 0.0 to 0.34 0.01, $p>0.001$ respectively) after therapy. There was a reduction of TG levels in our participants but it is not statistically significant. No significant correlation was observed between BMI or BW with any of the IR indices before the therapy but significant correlation developed later between BMI with FI ($r = 0.4$, $p>0.05$) and McA ($r = 0.48$, $p = 0.02$) after 3 months. The reduction of hepatic insulin sensitivity index (hepatic ISI) was significant and found a substantial positive association between hepatic ISI with BMI after the PIO therapy. Correlation between hepatic ISI with HOMA, QUICKI and McA also significant but no significant correlation was detected between TG, HOMA or QUICKI with BMI or BW before or after therapy in our study cohort.

Conclusions: There was an improvement of both hepatic and peripheral insulin sensitivity with three months of PIO. In addition, significant correlations between BMI vs. McA and FI but not with HOMA or QUICKI can be related to inclusion of TG in McA's equation but not in other indices. Reduction of both hepatic and peripheral IR suggests effects of PIO on fat clearance from liver. Therefore we propose that reduction of IR is related to the TG metabolic pathway possibly by clearance of VLDL-TGs and activation of lipoprotein lipase in plasma by PIO.

Introduction

Incidence of type 2 diabetes is reaching epidemic proportions globally, particularly in south Asian region. Type 2 diabetes is characterised by presence of IR and relative insulin deficiency, hence early identification is important for the management strategies of DM [1-3]. The euglycaemic insulin clamp and the intravenous glucose tolerance tests are gold standard methods for measurement of insulin resistance in research, but they are cumbersome in clinical practice and are difficult to perform in population based research studies. Therefore, indirect indices; McAuley, HOMA and QUICKI were used for assessment of IR in our study [3-5].

The accumulation of visceral fat is particularly assumed to play an important role in the aetiology of IR notably by the overexposure of the liver to free fatty acids [6], which results in insulin resistance and hyperinsulinaemia [1,2,7]. Peroxisome proliferator-activated receptor-(PPAR-) agonists, improve insulin sensitivity and lipaemia partly through enhancing adipose tissue proliferation and capacity for lipid retention [7,8]. Identification of correlation of (PPAR-) agonists with the obesity hence the BMI is necessary to develop public health policy and dietary and physical activity recommendations that are both comprehensive and effective in reversing the current trend.

Objectives

Our objective is to determine the effect of PIO therapy on kinetic changes of IR and obesity in adult type 2 diabetic population and correlation of IR with obesity hence BMI or BW or TGs.

Materials and method

The protocol for this study was approved by Ethical Committee of Faculty of Medicine, University of Ruhuna. 24 patients with type 2 diabetes were randomly selected when there is FBS >7 mmol/L (126 mg/dL) in one occasion when they are symptomatic or two occasions when they are asymptomatic. All patients were given verbal and written information about the study prior to providing written consent and invited for verbal and written feedback of individual results at the end of the study. Clinical history including age, sex, drugs, smoking, alcohol consumption level of physical exercise, previous history & family history of diabetes, dyslipidaemia, coronary artery disease and peripheral vascular disease were obtained. Exclusion criteria were; age outside the range of 30-65 years, hypothyroidism, liver, kidney or heart failure and neoplasm. Patients were given 15 mg of PIO daily and investigations were repeated at monthly interval during 3 months. Height and weight were determined with the subjects wearing light clothing without shoes. Each participant's weight and height were recorded and BMI was calculated using height (m) and weight (kg). After 12 hours of overnight fasting, blood samples were collected and deposited in dry tubes. The plasma was separated immediately using centrifugation at 4000 rpm for a period of 10 minutes. FBS was assessed by absorbance method (diagnostica – Merck). FI was measured by ELISA (diagnostic – automation). TG levels were measured enzymatically by colorimetric tests (LABKIT). McAuley described a method for measurement of insulin resistance (McA), which correlates with estimates of IR measured by the euglycemic clamp technique, was used as an index of IR [4]. It was calculated as follows.

McA = exp [2.63-0.28 (insulin in mU/L) – 0.31 (triglycerides in mmol/L)]

HOMA= insulin (U/m) × [glucose (mmol/L)/22.5]

$$\text{QUICKI} = \frac{1}{(\log \text{insulin} + \log \text{glycaemia in mg/dL})}$$

Subjects with McAuley 5.8 [4] and FI 12mu/L [4, 10-12] has been considered as insulin resistant in diabetic population. Patients were considered as insulin resistant when McA ? 5.8, HOMA ≥2.6 and QUICKI ≤0.33 [4]. Hepatic ISI was calculated by FPG and FPI as follows [7].

$$\frac{\kappa}{\text{FPG x FPI}}$$

This equation [7] is mathematically equivalent to the reduced formula of the homeostasis model assessment (HOMA), where $k = 22.5 \times 18$, and the hepatic ISI correlates closely with that measured directly with tritiated glucose [7, 13]. The product of basal hepatic glucose production (measured with tritiated glucose) and the FI concentration provides a direct measure of hepatic IR under postabsorptive conditions, whereas the inverse provides a measure of hepatic insulin sensitivity [7, 13].

Statistical analysis

For the descriptive statistics after having checked the normality of the variables using the Kolmogorov-Smirnov test, the usual central and dispersion methods were used: average, SD, and

95% CI. Power and sample size calculations were carried out based on the results of the current study, comparing changes in FI, IR, BW and BMI in 3 month of PIO allowing declaration of a difference before and after in same treatment group, at a significance level = 0.05, with power of 80%. The statistical significance of differences between the means were evaluated using the paired Student's T-test in the case of normal distribution of data sets, and using the Kolmogorov-Smirnov test when at least in one of the data sets the normal distribution was excluded. Correlation between two variables was studied with the Spearman rank-order. All statistical analyses were performed using Microcal origin 4.1 (2005) and Microsoft Excel whenever applicable.

Results

1.1 Baseline characteristics and changes in insulin resistance in our study group

The study cohort included 24 patients with mean age range from 45.83 1.82. Female to male ratio was 7:5. Table 1 shows the significant difference in mean values of FI, McA, HOMA and QUICKI indices after 3 months of PIO. Though there was a reduction of TG it was not statistically significant. Overall, these data support the conclusion that PIO treatment significantly increased insulin sensitivity in these patients.

Table 1 - Baseline basic characteristics and characteristics after three months of pioglitazone treatment

Data are mean ± SEM * $P < 0.001$ vs baseline

Basic characteristics	*Baseline*	*3 month*	*Level of significance*
Age	45.83 ± 1.82		
BW (Kg)	58.78 ± 2	59.08 ± 2	P=0.42
BMI (Kg/m^2)	23.95 ± 0.82	24.08 ± 0.85	P=0.37
TG (mmol/L)	1.82 ±0.08	1.70 ± 0.05	P<0.001*
FI (mU/L)	37.58 ± 6.09	16.58 ± 3.62	P<0.001*
McAuley	4.84 ± 0.27	6.26 ± 0.28	P<0.001*
HOMA	17.50 ± 3.36	5.40 ± 1.57	p<0.001*
QUICKI	0.27 ± 0.00	0.34 ± 0.01	p<0.001*

1.2 Statistically significant correlation between BMI with McA and FI after 3 months of PIO therapy

Our results show that there is no significant difference in changes of BMI, TG and BW after 3 months of PIO therapy (Table 1). In contrast, there was a significant reduction in FI, IR by McA, HOMA and QUICKI indices at the end of treatment (p<0.001, table 1). There was no significant correlation between BMI and BW with McA, HOMA, QUICKI or FI before the therapy (p>0.05). But there was significant correlation between BMI with FI (r = 0.4, p > 0.05) and McA (r = 0.48, p = 0. 02) after with 3 months of PIO therapy (fig 1). There was no significant correlation between BW with either of McA, HOMA, QUICKI or FI after PIO (data not shown).

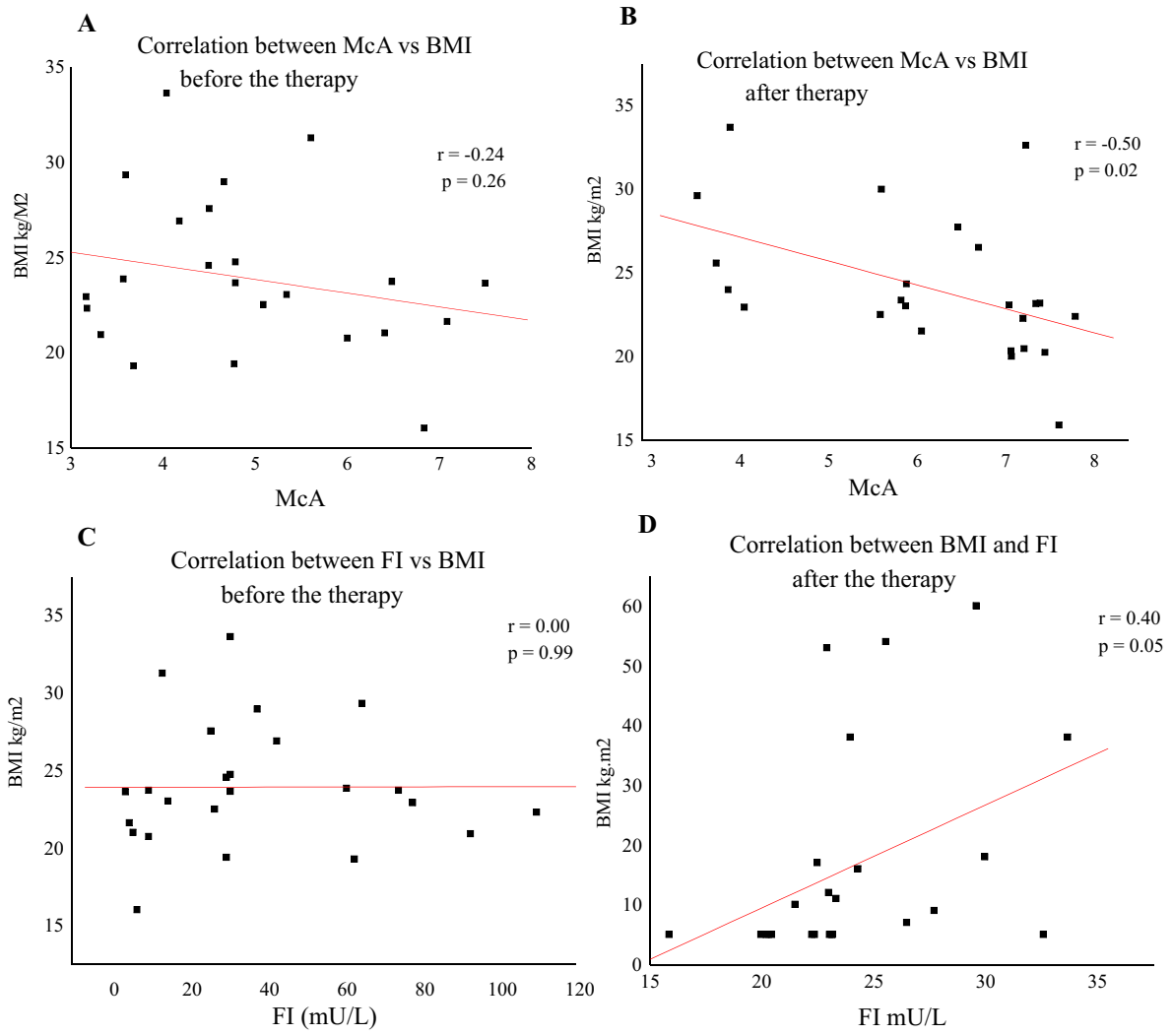

Figure 1 - Changes of correlation of fasting insulin (FI) and IR by McAuley index (McA) with BMI after 3months of PIO therapy. The Pearson's correlation coefficient and associated *P* value are shown.

1.3 Correlation of BMI with HOMA and QUICKI after 3 months of PIO.

Observation of significant correlation between BMI with McA or FI, we extended our study to evaluate correlation with others indirect indices as well. We found that difference in IR by HOMA and QUICKI after PIO therapy also statistically significant. This further confirmed that reduction of IR in our participants with PIO. Next, we investigated to see any correlation between HOMA, QUICKI with BMI or BW. Although there was an improvement of correlation between HOMA and QUICKI with either BMI or BW, it was not statistically significant (table 2).

Table 2 – Correlation of BMI or body weight with HOMA or QUICKI indices

Parameters	*Before the therapy*	*After the therapy*
BMI vs HOMA	r = - 0.02, p = 0.9	r = 0.22, p = 0.3
BMI vs QUICKI	r = - 0.23, p = 0.28	r = -0.37, p = 0.07
BW vs HOMA	r = - 0.01, p = 1.0	r = 0.13, p = 0.54
BW vs QUICKI	r = - 0.17, p = 0.4	r = -0.30, p = 0.14

Considering significant correlation between BMI with McA but not with HOMA or QUICKI, we thought that possibility of involvement of TG metabolism in improvement of IR despite increment of BMI. Therefore we further investigated to see any correlation with TG in our study cohort.

Correlation coefficient was calculated between TG with BMI, BW, FI, McA, HOMA and QUICKI. Although there was clinical reduction (but not statistically significant) in TG levels, we could not find any significant correlation between TG with any of the above parameters in our study group (table 3).

Table 3 - Correlation between TG and other biochemical and clinical parameters of the study group with the pioglitazone treatment.

Parameter	*Before*		*After*	
	r - value	p - value	r - value	p - value
TG vs BW	0.11	0.60	-0.08	0.72
TG vs BMI	0.09	0.66	0.07	0.73
TG vs FI	0.09	0.64	-0.04	0.86
TG vs McA	-0.12	0.56	-0.07	0.98
TG vs HOMA	0.21	0.32	-0.34	0.22
TG vs QUICKI	-0.01	0.95	0.26	0.21

1.4 Statistically significant correlation of BMI with hepatic ISI after 3 months of PIO therapy

Observed results in peripheral IR with the PIO, we further extended our study to see any effects of PIO on hepatic ISI in our study cohort. The reduction of hepatic ISI with the treatment of 15mg of PIO was statistically significant (figure 2A). There was a significant reduction in mean hepatic ISI after 3 months of PIO in our patients (0.15 0.03 to 0.43 0.05, p<0.05, fig 2B). Pearson's correlation coefficient was used to investigate the correlations. There was a substantial positive association between hepatic ISI with BMI (figure 2C & 2D) after the PIO therapy. Correlation between hepatic ISI with HOMA, QUICKI and McA also significant (p<0.001, data are not shown).

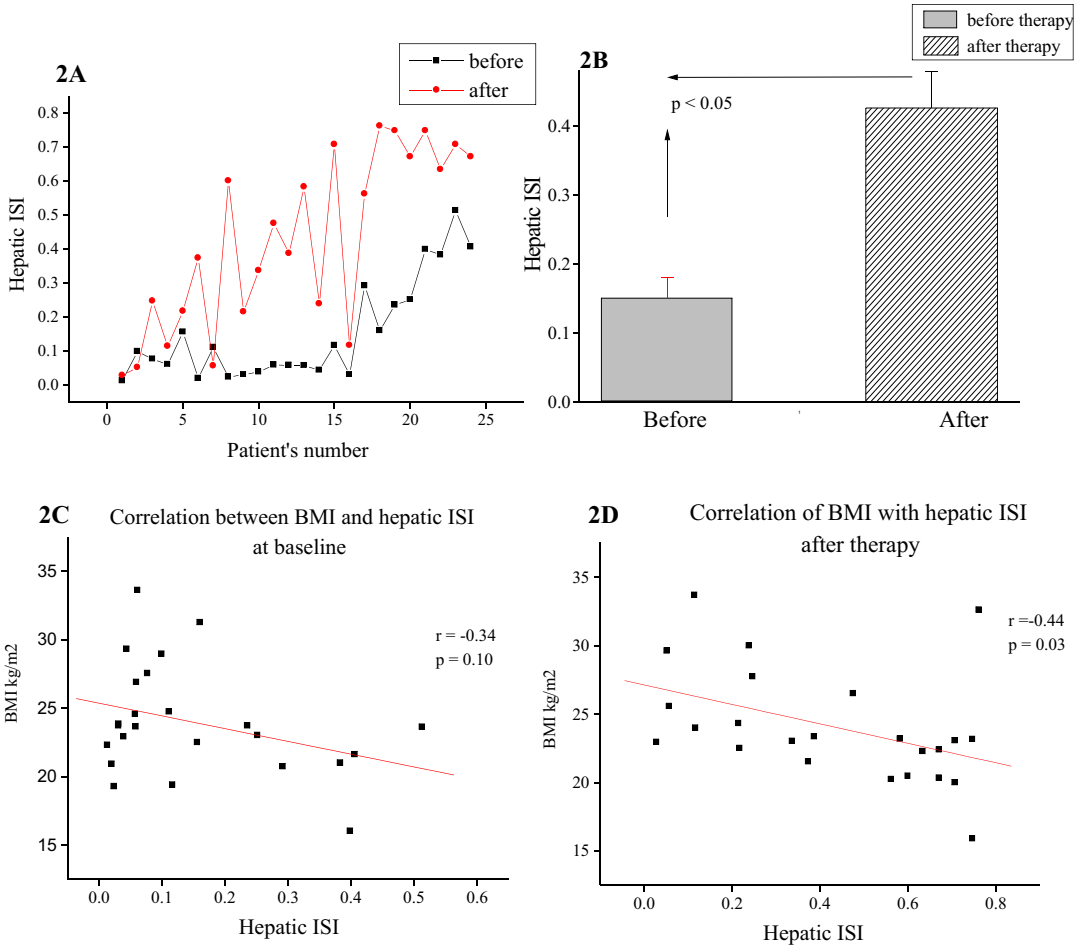

Figure 2A - Changes of hepatic ISI index after 15 mg of PIO therapy. The changes in data are statistically significant (p<0.05). **Figure 2B** shows the difference in mean values of hepatic ISI index (p<0.05). There was a statistically significant substantial correlation developed between BMI and hepatic ISI index after PIO therapy (p<0.05)

Discussion

In light of the well-documented relationship between obesity and IR the treatment effects of PIO appear to be paradoxical in that their insulin-sensitizing effects occur in the presence of an increase in BW and whole-body adiposity. Therefore goal of this study was to identify the possible mechanism by PIO on interference on lipid in the process of improvement of IR in diabetic patients.

Recent studies have demonstrated that the PIO induced weight gain is associated with an increase in subcutaneous adipose tissue and a concomitant decrease in visceral fat content [7]. Increase in BW in our study despite the improved insulin sensitivity can be explained by this fat redistribution due to remodeling of abdominal fat tissue [7]. Another previous study shows that there was a dose-dependent increase in BW and BMI after 24 weeks in the pioglitazone-treated groups [11]. The seemingly paradoxical relationship between weight gain and improved glucose homeostasis/insulin sensitivity most likely is explained by the basic cellular mechanism of action of the thiazolidinediones, which exert their effects through the PPAR-. PPAR- activation also induces key enzymes involved in lipogenesis in newly formed adipocytes [2].

Our patients, who were insulin resistant, have become insulin sensitive after three months of PIO. In addition, there was significant correlation between BMI and McA as well as with FI levels after PIO. Significant correlations between BMI vs McA and FI but not with HOMA or QUICKI indicate the feasible mechanism of reducing IR by PIO possibly by interference with TG metabolism. Our results are supported with previous results showing PPAR agonists improve insulin sensitivity mainly through adipose tissue remodeling, increased capacity for lipid uptake/retention, and altered adipocytokine secretion pattern [14, 16]. Kazunori N. *et al* also shows PIO reduces TG by decreasing secretion of both VLDL, TGs and VLDL apoB via lipoprotein lipase activation, by improving adipose tissue sensitivity to insulin and also reduction of plasma insulin and hepatic lipogenesis [16]. They did not observe any significant difference in total cholesterol and LDL levels with PIO [16]. Increased visceral fat is associated with IR [16], and reduction in visceral fat would be expected to lead to an enhancement in insulin sensitivity [17]. Because thiazolidinedione treatment consistently reduces plasma free fatty acid levels [17], this may provide another explanation for the improvement in insulin sensitivity despite weight gain. Considering above reports our data suggest that there may be a common metabolic pathway for both reduction of IR and plasma TG levels possible via increase of lipoprotein lipase activity.

Insignificant correlation between BMI with HOMA or QUICKI can be due to exclusion of TG levels in HOMA and QUICKI equations. Further, McA was identified as method of detecting IR when confronted with minimal model approximation of the metabolism of glucose (MMAMG) with very high sensitivity and specificity values [4, 5]. In contrast, another study shows evidence in all participants (black and white adolescent girls), during 10-years, changes in BMI were positively correlated with changes in insulin ($r = 0.26$, $P < 0.0001$) as well as in HOMA insulin resistance ($r = 0.24$, $P < 0.0001$) [12]. This finding concurs with our results to explain development of correlation between BMI with IR indices after the PIO therapy. Although we studied patients with 15 mg of PIO we would not comment on the effects of high doses of 30 mg or 45 mg of PIO on correlation of IR with BMI or hepatic ISI. But Yoshinori *et al* says PIO improves glycemic control through the dose-dependent enhancement of ß-cell function and improved whole-body and hepatic insulin sensitivity [16]. We also found that PIO treatment causes significant increment of hepatic ISI in diabetic patients and it has significant correlations with BMI, McA, HOMA and QUICKI indices. Our results are compatible with Yoshinori Miyazaki et al showing that hepatic ISI increased in the 15-, 30-, and 45-mg/day pioglitazone groups [14] ($P < 0.05–0.01$). Because basal hepatic glucose production is closely correlated with FBS, the inverse of the product of FBS and FI provides an index of hepatic insulin sensitivity [18]. It can be

concluded that PIO decreases FBS levels through improvements in hepatic/whole-body insulin sensitivity and in ß-cell function in type 2 diabetic patients.

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Use of fine needle aspiration cytology on thyroid lumps

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Abstract

Introduction: Fine needle aspiration cytology (FNAC) plays a crucial role in the diagnosis of thyroid nodules and help to avoid number of surgical operations. Theoretically, FNAC should be carried out on all nodules, though currently only those displaying certain characteristics are biopsied. Indeed, performing FNAC on all nodules may be regarded as an excess of zeal. Therefore, it seems advisable that the endocrinologists should be able to confirm on the spot the necessity and utility of FNAC.

Methods: To determine the value of FNAC in the diagnosis of thyroid nodules, thyroid cytology of 110 patients with definitive histology after surgery was analysed from 2005 January to2006 December. FNAC was correlated with histology and the sensitivity and specificity were calculated. The method of FNAC and number of non-diagnostic aspirates were noted.

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Methods: To determine the value of FNAC in the diagnosis of thyroid nodules, thyroid cytology of 110 patients with definitive histology after surgery was analysed from 2005 January to2006 December. FNAC was correlated with histology and the sensitivity and specificity were calculated. The method of FNAC and number of non-diagnostic aspirates were noted.

Results: The overall sensitivity of FNAC detecting thyroid neoplasia was 80.2% and specificity was 97.2%.

Conclusions: FNAC should be undertaken with ultrasound guidance and if possible with a pathologist in attendance to assess sample adequacy. If solitary nodules are to be observed, repeat FNAC should be undertaken because of the high false negative rate.

Introduction

Thyroid cancer accounts for only 0.4% of all cancer deaths and approximately 5 deaths per million population in the United States each year [1]. However, its clinical importance is disproportionate to its incidence because cancers of the thyroid must be differentiated from the much more frequent benign nodules (adenomas and multinodular goiters). Clinically detectable thyroid nodules occur in up to 4% of the population. With ultrasound, nodules may be found in up to 50% of the population over 60 years of age [2].

Fine needle aspiration cytology (FNAC) plays a crucial role in the diagnosis of thyroid nodules and enables the number of surgical operations to be reduced. Theoretically, FNAC should be carried out on all nodules, though currently only those displaying certain characteristics are biopsied. Therefore, it seems advisable that the endocrinologist should be able to confirm on the spot the necessity and utility of FNAC. Together with clinical and biochemical evaluation, ultrasound guided FNAC remains the first line diagnostic test in the management of thyroid nodules [3].

Methods

This study was performed at North Colombo Teaching Hospital (NCTH). All patients undergoing thyroid surgery from January 2005 to December 2006 at NCTH were identified and the definitive histological finding recorded along with FNAC report. The FNAC was performed by a technician under supervision of a consultant pathologist and slices examined by cytopathologist. FNAC findings were categorised as malignant cytology, suspicious cytology (follicular neoplasm), benign cytology, and inadequate sample.

Results

One hundred and ten patients (72 females, 38males) with mean age of 46 years (range 26-59 years) underwent total thyroidectomy after FNAC. Out of one hundred and ten patients, FNAC report came as malignancy in ten patients (9.1%). Among these 10 patients, histology proved malignancy in 9 patients. Histology revealed malignancy in fifteen out of sixteen who had suspicious FNAC. Among the seventy eight patients who had benign FNAC, there were six patients with a malignant histology. In six patients FNAC came as an inadequate sample. The malignant cytology and suspicious cytology was considered as thyroid neoplasia and specificity and sensitivity were calculated. The overall sensitivity of FNAC detecting thyroid neoplasia was 80.2% and specificity was 97.2%.

Discussion

This study shows that together with clinical history and biochemical evaluation, FNAC remains a first line diagnostic test in the management of thyroid nodules. Fine needle aspiration cytologic (FNAC) examination has been widely adopted after numerous favorable reports of its accuracy [2]. The procedure is technically simple and acceptable to patients, but it requires an experienced operator and collaboration with a skilled cytopathologist who is capable of interpreting thyroid aspirations. Significant complications such as bleeding, infection, necrosis, or cyst formation are rare. Adequate specimens can be obtained in more than 90% of patients when two or three passes are prepared for analysis. When FNAC is used in experienced hands, false-negative and false-positive diagnoses occur in less than 5% of cases. Currently, FNAC is viewed as the "gold standard" for diagnosis in most cases, and it plays a crucial role in the selection of patients for operation. Gharib and co-workers recently analysed data on 10,000 FNAC and found the procedure to be the preferred first step in the diagnosis. The diagnostic accuracy was nearly 98%, with less than 2% false-positive and false-negative results [4].

In general, 5% to 8% of aspirates are diagnostic of malignancy, 10% to 20% are considered suspicious but not diagnostic (demonstrating micro follicular cytology), 2% to 5% fail to provide an adequate specimen, and the remainder is considered benign, usually suggestive of a "colloid nodule" or thyroiditis [4].

An inadequate specimen should lead to re-aspiration. A biopsy of nonpalpable nodules can be performed under ultrasound guidance. Nonpalpable thyroid nodules, typically less than 1cm in size, are usually non malignant. Ultrasound-guided fine needle aspiration biopsy may be appropriate in these individuals. A positive diagnosis of cancer leads to surgery. Patients with suspicious FNAC report should also undergo surgery since approximately 25% prove to be malignant.

In one study by Sidoti M *et al.* the FNAC was performed under ultrasound guidance in accordance with a standard technique. Authors concluded that together with clinical and biochemical evaluation, ultrasound guided FNAC remains the first line diagnostic test in the management of thyroid nodules [3]. In another study done by Morgan J L *et al* it was concluded that FNAC was essential in the management of thyroid nodules [5]. 'Malignant' or 'suspicious for malignancy' cytology are absolute indicators for thyroidectomy. FNAC should be undertaken with ultrasound guidance and if possible with a pathologist in attendance to assess sample adequacy [6]. Recent studies conducted by

Valiyaparambath XJ *et al*, showed that ultrasound-guided FNAC is the gold standard diagnostic tool for management of thyroid nodules [6]. According to above studies, FNAC is useful in evaluating thyroid nodules, but the non diagnostic rate of FNAC must be minimised. There are strategies to enable this, depending on local resources. Increase access to cytologists or cytology technicians, diagnostic ultrasound image guidance for FNAC and the use of ultrasound guided core biopsy [7].

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Consent in medical practice

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The competent adult patient has a fundamental right to give or withhold consent to examination, investigation or treatment. This right is founded on the moral principle of respect of autonomy.

The word "consent" is defined in the Oxford English dictionary as "permission for something to happen or agreement to do something" [1]. Consent is a concept of great complexity. For most people it means an agreement to a course of action based on full information, free of constraint and given verbally or in writing. In the field of Medicine, consent has always been a difficult and worrying area for medical officers.

Consent in medical practice need to be considered in the following situations.

- Examination of a living patient for the purpose of diagnosis and subsequent treatment (includes surgical procedures).
- Examination of a living patient for medico-legal purposes.
- Postmortem examination and removal of tissues for transplantation.
- Collecting data from patients for medical research purposes.

The nature of the consent

One of the important basic human rights is freedom from physical interference by another person. Therefore, a person with sufficient maturity and sound mentality can take a decision to accept or refuse the proposed physical examination, procedure or treatment by the doctor. With few exceptions, consent to examination and treatment is mandatory before a doctor approaches the patient. Any medical examination, investigation or treatment (or even deliberately touching the patient) carried out without consent may amount to an assault and could result in criminal proceedings as well as proceedings in the civil courts. This has been described in the Section 341 and 342 of the Penal Code of Sri Lanka [2].

Consent may be either implied or expressed.

Implied consent – This is determined by the behaviour of the patient and by far the most common form of consent in both hospital practice and general practice. Implied consent could be assumed when a patient calls a doctor to attend at home or attends the doctor's clinic for treatment. However, this is valid only for inspection, palpation, percussion and auscultation and not for more complex procedures.

Expressed consent – Anything other than that described in implied consent belongs to expressed consent. This may be either verbal or written. For majority of minor procedures and examinations verbal consent is sufficient but this should be obtained in the presence of disinterested third person. When obtaining verbal consent is witnessed, it is equally valid as written consent. Written consent is obtained in a properly prepared consent form for all major diagnostic procedures, anaesthesia and surgical procedures. The written consent should be for one specific procedure. Common practice of obtaining uninformed, unexplained "blanket" consent on admission to cover any subsequent medical procedure has no legal validity.

Informed consent – This concept has come to practice in recent years and many civil cases have been brought by patients stating that they did not understand the nature of medical procedure for which they gave consent. This concept is applied more strictly in the USA and Canada [3].

For the informed consent the following points should be noted:

- All relevant information about the disease or the condition from which patient is a suffering and treatment options must be outlined.
- Significant risks associated with every medical procedure and treatment must be disclosed.
- The patient must be informed about all the available alternative treatment options.
- Everything that is told to the patient must be explained in simple language with comprehensible non-medical terms.
- Every effort should be made to ensure that the patient truly understands what is being told.

From whom consent is obtained?

A valid consent can be given by conscious mentally sound adults. For this purpose, adult means persons over 18 years of age. In the case of sterilization or termination of pregnancy, the wishes of the spouse are usually sought but legally not necessary. When the age is below 18 years the consent should be obtained from *in loco parentis* – natural or adaptive parents, guardian or legal custodian. Obtaining a truly voluntary and properly informed consent from those who are mentally ill is a complex issue.

Even though patients may be mentally very abnormal in one respect they may be perfectly rational in other ways. However, a handicapped person may understand and be legally competent to give valid consent when explanations are simple, repeated and given to them by someone they trust. When the patient is unable to understand the nature of the illness and the proposed treatment the legal situation is unclear as no one can give consent on behalf of a mentally ill patient. However, in common practice doctor seeks consent from a relative or guardian.

Genuine emergencies are the exceptions to the general rule. The doctor may have to treat the patient, as the immediate treatment is necessary to save the life of the patient. However, the doctor must take utmost care to practice standards of care required consistent with the circumstances of the case. The doctor should try to obtain the consent from the next of kin or relative in such an emergency.

Validity of the consent

In general, the following five elements of the consent are mandatory for the consent to be valid [4].

- The consent must be given freely.
- It should be specific.
- It should cover the treatment and/or procedure to be done.
- It should be based on a proper understanding of the nature, implications and the complications of the proposed procedure.
- It should be given by person who is legally able to give the consent.

According to the Section 83 of the Penal Code of Sri Lanka, consent is invalid when given under fear, by misconception of facts or under intoxication [1]. Consent is invalid if the person giving consent is unable to understand the nature and consequences, of unsound mind or under the age of 18.

Alterations, hidden extras and restrictions

The consent should be obtained in a properly prepared consent form. Alterations should not be made to the consent form after the patient has signed it. If there is any change of the planned procedure or treatment, it should be informed to the patient and fresh consent should be obtained. Any additional procedures should not be carried out without the consent of the patient unless the additional procedure or treatment is really necessary to save the life of the patient [5].

Examination for medico-legal purposes

Medico-legal examinations are frequently carried out for the benefit of the patient and in some cases for diagnostic purposes and

treatment. Other than in a limited range of exceptions, expressed written consent must be obtained in every case. Third party (especially the police) cannot authorize examination without the consent of the patient or the victim. The person accused or otherwise has the right to be examined by a doctor of his own (not practiced in Sri Lanka). Also the patient or the victim has the right to refuse the examination by the doctor [3].

Consent for taking intimate samples – Intimate samples (blood, semen, tissue fluids, urine, saliva, pubic hair or swabs from body orifices) may be taken in certain circumstances from the people in the custody. The written consent must be taken unless the order was issued from the court of law.

Postmortem examination and removal of tissues for transplantation

Either a magistrate or an Inquirer in to Sudden Death (ISD) authorizes a judicial autopsy. The consent from relatives of the deceased is not necessary for a judicial autopsy. However, expressed written consent of the next of kin or relative is mandatory for a pathological or "academic" autopsy.

Consent for transplantation – The internal organs can be removed from a dead body for transplant purposes if the deceased person has indicated his willingness to do so when alive or when the written consent is given by surviving spouse or next of kin of the deceased [6]. The magistrate or ISD cannot give consent for the removal of tissues.

In the case of living donors, a full explanation of the procedure involved must be given to the donor; the possible consequences and risks must be fully explained. A written expressed consent should be obtained from the donor.

Consent in medical research

Research is an important aspect in medical practice**.** All the researchers who undertake clinical research must comply with the international ethical principles, which govern clinical research. Informed consent is an essential element in a medical research involving human subjects. Informed consent is a process by which a subject voluntarily confirms his/her willingness to participate in a particular trial, after having been informed of all aspects of the trial that are relevant to the subject's decision to participate. Informed consent consists of three elements.

- Disclosure of information to the research subject.
- Understanding by the subject.
- Voluntariness of the decision.

Key points

- Consent should not be obtained under duress and must be fully informed.
- Verbal consent is perfectly valid in law but written consent is more important for major procedures.
- Consent should be obtained before the proposed procedure or treatment.
- Consent should be obtained only by someone who is appropriately qualified and familiar with all the details and risks of the proposed procedure or treatment.

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Prostate-specific antigen and unwarranted use of costly investigations in medical practice

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Unnecessary testing is becoming increasingly common in medical practice and consumer demand for certain type of investigations has escalated. Such testing is expensive and diverts patient and clinicians' time from addressing more genuine needs. In addition, these can provide unwarranted reassurance or cause unnecessary anxiety and can lead to further interventions that may carry risks of significant morbidity and even mortality. Unnecessary testing has been promoted by both well-intentioned medical practitioners and outright quacks for centuries. Due to lack of health literacy and/or powerful need for reassurance, many individuals are willing to pay, sometimes exorbitant amounts for screening tests that lack scientific merit. Some professionals and institutes prey on fear of serious illnesses and on an individual's natural desire to detect health problems early in hopes of achieving a cure.

Testing serum prostate-specific antigen (PSA) is a classic example of this trend. In the past three decades since its discovery, PSA has been recognised as the most effective tumour marker for prostate cancer. It has unquestionably played an important role in the diagnosis and clinical management of this disease [1]. Despite the success of PSA as a tumour marker both clinical and analytical limitations of PSA remain. Hence, interpretation of PSA results and subsequent decision making is a complex process which requires critical analysis and wise clinical judgment.

To begin with, there is no consensus on the upper limit of the normal range for serum PSA. Some believe it should be 2.6 ng/mL and not 4.0 ng/mL in order to avoid missing early prostatic malignancies [2]. Inter-racial difference in the normal level and inter-lab variations of PSA estimations are well known [3]. Differences may persist even among assays from the same manufacturer that have the same antibodies but different assay formats [4]. With most of the laboratories in Sri Lanka lacking any form of standardisation and quality assurance, potential discrepancies in PSA levels due to analytical errors should be borne in mind. Lack of data regarding the norms for PSA levels in Sri Lankan men compounds the issue further. It has been shown that even the effect of age on PSA is different in different populations [5].

Although PSA is considered an effective tumour marker and is organ specific, there is considerable overlap in PSA concentrations in men with prostatic carcinoma and men with benign prostatic diseases. Even attempts to improve the diagnostic accuracy of PSA including age-specific PSA, free PSA, PSA density, PSA velocity and the molecular forms of PSA have failed to improve the specificity any further significantly despite the initial enthusiasm. Many other factors have been incriminated to affect the PSA levels. These include acute bacterial prostatitis, acute urinary retention, recent ejaculation, prostate massage, prostate biopsy and transurethral resection of the prostate [6]. In fact false positives are so common with PSA some recommend a second PSA assay in six weeks before proceeding for a biopsy after an initially high PSA [7].

Although PSA is the best tumour marker currently available for detecting prostatic carcinoma, its suitability as a screening tool remains controversial. Therefore, even the developed countries do not recommend screening programmes using PSA to detect early prostatic carcinoma [8]. Although the experts continue to argue about the evidence on

screening, the public and many 'non-urological' medical personnel have come to different conclusions. Epidemiological or clinical evidence may play a small part in the public's demand for screening for prostate cancer by PSA testing. Instead the irresistible logic of finding the cancer early, the drive to avoid regretting later their decision not to have the test and the right to obtain information about oneself by testing may all be more important arguments. These lay arguments for PSA testing have their own logic and validity. In this era of litigation and defensive medicine the experts may also be inclined to be swept away by these demands. But the consequences of screening can be far reaching than we may imagine. Screening is costly, particularly for a developing country like Sri Lanka where health care funds are limited. Furthermore, screening is a process of changing the identities; it is not a trivial matter. It has profound health, social, psychological and economic consequences [9]. Screening therefore raises important ethical problems. Hence, use of PSA as a screening tool must be based on sound research and good governance.

Many clinicians in USA promote aggressive testing for serum PSA with the hope of identifying patients with early and potentially more curable prostate cancer [10]. However, the impact of identifying prostate cancers early using PSA on longterm survival is still a contentious issue [11]. Many cite improvements in improved survival rates. PSA testing has advanced the time of diagnosis of prostate cancer by as much as 5-10 years [12]. This lead time bias alone will appear to improve survival rates dramatically. Clinical outcomes can be influenced by another factor – Gleason score shift [13,14]. Although the Gleason scoring system itself has not changed its application has. Clinicians treating contemporary populations with newly diagnosed prostate cancer in USA rarely encounter men with low Gleason scores, whereas two decades ago low Gleason scores were very common [15]. One possibility for this change is that pathologists are more hesitant to assign low Gleason scores to contemporary prostatic biopsy specimens because these scores are frequently upgraded after review of the main surgical specimen of radical prostatectomy. Early days when radical surgery was not done, only the low Gleason score of the biopsy was available for analysis. If this explanation is correct the resulting shift in Gleason scores would lead to apparent improvements in survival when, in fact such improvements have not occurred.

Many clinicians in this country use serum PSA for 'case-finding' prostate cancer within those patients presenting with acute urinary retention (AUR). AUR leads to a temporary elevation of serum PSA levels. Although the precise mechanism is unclear, it is believed to be due to prostatic infarction [16]. Prostatic biopsies are done unnecessarily after seeing high PSA values obtained on patients admitted with AUR. This is further compounded by the fact that it occurs in a relatively elderly group who may have significant co-morbidity. This may lead to unnecessary complications with significant health, social, psychological and economic implications. Serum PSA estimation in the private sector will cost about Rs. 3,000/=. According to the Central Bank figures, the average annual income of a Sri Lankan is Rs. 4,326/= [17]. It is not uncommon for some clinicians to request serum PSA estimation even without assessing the prostate clinically by digital rectal examination.

The use of clinically unjustifiable tests erodes the scientific basis of medical practice and sends a wrong message to trainees and patients about when and why to use diagnostic studies. Such use also runs counter to physicians ethical obligations to contribute to the responsible stewardship of health care resources. Without adequate education and knowledge, clinicians may lack the courage to refuse unwarranted testing. Commercial interests worsen the situation.

Improved science & health education, scientific integrity of individuals & institutes and better communication between patients & healthcare providers would help to increased use of appropriate, less harmful and less costly investigations which will enhance health outcomes.

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Gastro-oesophageal reflux disease: time to re-visit

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In 1892 William Osler suggested that oesophagus could be a source of episodic chest pain but only in 1955 that Flood *et al.* was able to demonstrate this [1]. He showed that oesophageal aspirate from a patient with heart burn had more acid content than the control. It is well recognized that Gastro-oesophageal Reflux Disease (GORD) could be a source of chest pain as well as regurgitation. It is a common problem in the general population but there was some uncertainty regarding diagnosis until the recent past. Although there were number of guidelines and recommendations for the diagnosis and management of GORD, a universally accepted definition of GORD was lacking. This uncertainty led to much confusion in clinical practice as well as research.

Few years back an International Consensus Group was appointed to develop a global definition and classification of GORD. This Group included 44 experts from 18 different countries. They studied the literature, data bases and came up with a set of statements on GORD which were reviewed, modified over a period of 2 years. A modified Delphi process was used to develop the final consensus definition on GORD. At the final vote, 94% of the final 51 statements were approved by 90% of the Consensus Group, and 90% of statements were accepted with strong agreement or with minor reservations. The results of the study were first presented at the World Congress of Gastroenterology in Montreal. This is known as **Montreal Definition and Classification of Gastro-oesophageal Reflux Disease**. The final document was endorsed by the World Organization of Gastroenterology (WGO-OMGE) as "an important development in a critical area of gastroenterology worldwide."

According to the global definition of GORD it is a condition which develops when the reflux of stomach contents causes troublesome symptoms and/or complications [2]. There are some important features in this definition. It identifies reflux of stomach contents as the etiology and symptoms should trouble an individual to constitute the diagnosis. In clinical practice, individual patient should decide whether symptoms are troublesome or not and in epidemiological studies minor symptoms occurring two days or moderate/severe symptoms occurring once a day per week is taken as troublesome. This definition also includes common complications of GORD like reflux oesophagitis, stricture, Barrett's oesophagus and adenocarcinoma of the oesophagus if they are symptomatic. Retrosternal burning pain and regurgitation had been identified as the most common symptom where as most common injury had been identified ass reflux oesophagitis. Retrosternal burning pain is defined as feeling of burning pain behind the breast bone and regurgitation as feeling of stomach content regurgitating in to the mouth or hypopharynx.

The Montreal Definition and Classification identifies GORD as a disease which could present in many different ways. This is a new concept by which GORD-related manifestations are identified as a set of syndromes. If the symptoms are related to oesophagus it is classified as Oesophageal Syndromes and if the symptoms are not related to oesophagus then as Extra-oesophageal Syndromes. The classification is as follows.

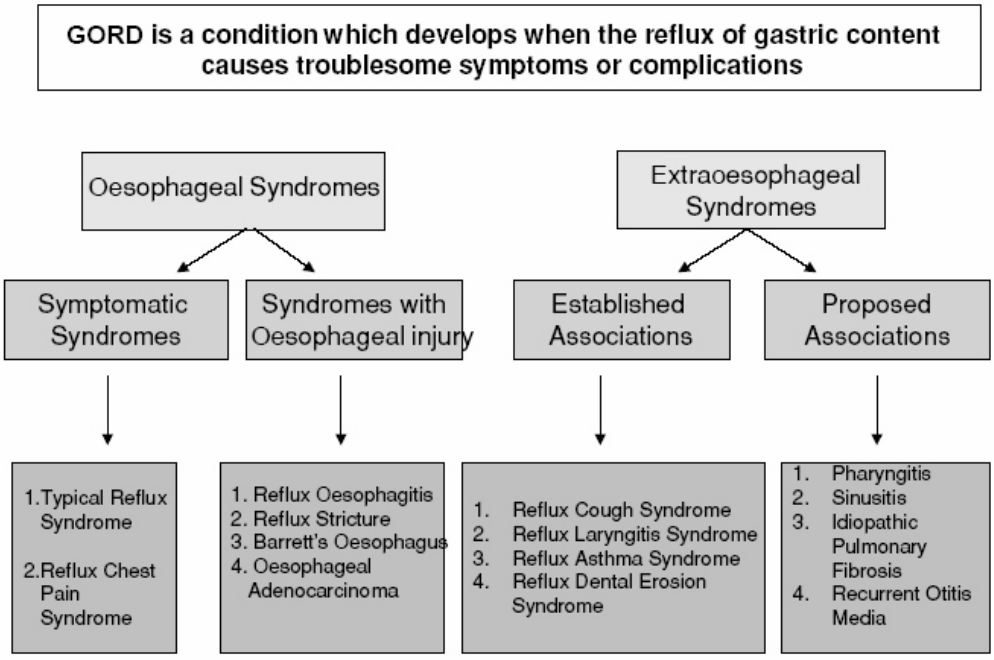

Figure 1 - The overall definition of GORD and its constituent syndromes.

Symptomatic Syndromes

Uninvestigated patients with oesophageal symptoms but without evidence of oesophageal injury are considered to have oesophageal symptomatic syndromes while patients who do have demonstrable injury are classified as oesophageal syndromes with oesophageal injury.

A patient who presents with characteristic troublesome burning chest pain and regurgitation has **Typical reflux syndrome**. If this type of patient undergoes endoscopy at primary care level, >50% of the time no abnormalities would be found and it is called endoscopy negative reflux disease (ENRD). This indicates that at primary care level patients with typical reflux syndrome could be treated without subjecting them for endoscopy [2].

When a patient presents with chest pain due to oesophageal reflux without typical reflux symptoms or the pain is overshadowing typical reflux symptoms then they are classified as **Reflux chest pain syndrome**. The consensus report further states that Reflux chest pain syndrome is indistinguishable from ischemic cardiac pain [2]. There fore it is a diagnosis made after exclusion. This entity is identified by some as Non cardiac chest pain (NCCP). In approximately 30% of patients with recurrent NCCP, the cause is identified as GORD [3].

Prevalence and Economic Burden

Prevalence of GORD varies in different parts of the world. The prevalence is as high as 20% in some parts of Europe and North America. In Asia the incidence is low but a rising trend has been noted. In Singapore the prevalence of GORD symptoms in the general population has risen from 5.5% population in 1994 to 10.5 in 1999 [4]. It has been attributed to several causes including westernized lifestyle, better sanitation and eradication of *helicobacter pylori*. It is interesting to note that GORD or its complications are a rare finding in Sub Sahara Africa.

In Western countries GORD uses a significant part of the healthcare budget. It is estimated in the USA this accounts for about US $ 10 billion per annum [5]. An estimated £ 250 million is spent every year by primary-care doctors in the UK alone on drug treatment to control the symptoms of GORD [6].

Life style factors associated with GORD

Lifestyle factors like overweight, obesity and smoking are associated with increased reflux symptoms [7]. This is well demonstrated in studies from Singapore which is a multiethnic country where Indians, Malays and Chinese live. Indians are more obese, eat more spicy food than their counterparts and the prevalence of GORD is also common among Indians [8, 9].

Syndromes with oesophageal injury

A symptomatic patient who undergoes endoscopy and has demonstrable oesophageal injury is classified under syndromes with oesophageal injury. Commonest injury identified is **reflux oesophagitis** which is defined endoscopically by visible breaks of the distal oesophageal mucosa [2]. The advantage of this definition is that it could easily be documented during endoscopy and provides an objective criterion for diagnosis. The consensus document had highlighted the importance of having a common classification in describing reflux oesophagitis. In this regard Los Angeles classification of reflux oesophagitis has been recommended as a simple and effective classification [10].

The characteristic symptom of a **reflux stricture** is persistent troublesome dysphagia. As progressive or troublesome dysphagia could be a warning symptom for cancer of the oesophagus, it warrants urgent investigation.

Barrett's oesophagus is columnar metaplasia of the lower oesophagus. It is observed that some clinicians still diagnose Barrett's oesophagus solely on the basis of endoscopic appearance. This is not a very sensitive method of diagnosing. The consensus document has suggested a new terminology. When the endoscopic appearance is suggestive of Barrett's oesophagus then it will be called **Endoscopically suspected esophageal metaplasia (ESEM).** Further classification will depend on the histological appearance**.** Only when histology confirms oesophageal metaplasia, the diagnosis of Barrett's oesophagus will be entertained. Consensus document further highlights the importance of classifying according to histological type and the extent of the lesion. Long-segment Barrett's oesophagus with intestinal type metaplasia is the most important identified risk factor for oesophageal adenocarcinoma.

Adenocarcinoma of the oesophagus is a complication of chronic GORD. Higher frequency (greater than 3 times per week) and long duration (greater than 10 - 20 yr) of GORD symptoms increases the risk of adenocarcinoma [11]. According to recent data from the United States, the incidence of adenocarcinoma of the oesophagus now has surpassed the rate of squamous carcinoma [12].

Extra-oesophageal Syndromes

There are established as well as proposed extra-oesophageal manifestations of GORD. Some authorities believe extra-oesophageal manifestations are common in East and Asia. Extra-oesophageal reflux and micro aspiration may also play a part in **Reflux Asthma Syndrome.** It is well known that asthma treatment may predispose to GORD. GORD is usually an exacerbating co-factor rather than uniquely causative. Reflux symptoms are reported by 45% of patients with asthma compared with 10% of the general population [13]. A study has shown that asthma symptom scores continue to decline over three months period during omeprazole therapy [14]. In poorly controlled asthma it is reasonable to treat GORD as well. Chronic cough, Laryngitis and dental erosions are other well known associations of GORD. There are few other possible associations of GORD as well.

Treatment of GORD

The treatment of GORD includes lifestyle modification and standard dose proton pump inhibitors (SD PPI) fore 4 weeks. In ENRD patients, the symptoms response rate after four weeks of SD PPI therapy ranges between 46% and 57% [15]. If there is partial response to treatment then continuing for further 4 weeks could benefit. If there is no response then double

dose proton pump inhibitors for 4 weeks is recommended. It had been shown using omeprazole 40mg daily for 2/52 has a 37% symptom response rate in resistant cases [16]. Low doses tricyclic antidepressants or selective serotonin reuptake inhibitors have been shown to reduce pain in other functional oesophageal disorders, such as non-cardiac chest pain [17].

Conclusions

GORD is a common problem in the west with significant economic burden. Prevalence of GORD is increasing world wide. Although we lack local data, situation is not much different in Sri Lanka. The Montreal Definition and Classification of Gastro-oesophageal Reflux Disease had simplified the diagnosis. Acceptance of the definition will bring uniformity in diagnosis, treatment and research. Early detection and proper treatment of GORD could prevent potentially fatal complications.

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Anaemia in chronic kidney disease in children

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Anaemia is a common, recognized complication of chronic kidney disease (CKD) among children and adults. It was previously considered as a late complication of CKD occurring when the glomerular filtration rate (GFR) falls below 35ml / min / 1.73m^2. However, more recent data indicate that the haemoglobin level starts to decline at much lesser degrees of renal impairment, and on average is significantly reduced at GFR below 60ml / min / 1.73m^2 and the severity increases progressively as the renal function deteriorates [1].

The prevalence of cardiovascular disease (CVD) in individuals with progressive kidney disease has been shown to be high in several cross sectional studies. Anaemia and hypertension have been shown to be the principal risk factors for the prevalence of left ventricular hypertrophy in CKD [2]. Although treatment of hypertension early in the course of CKD is widely accepted in clinical practice, treatment of anaemia early has not gained equal priority.

Because of their young age at onset of CKD, children have a high lifetime exposure to these risk factors for CVD. Therefore, it is important to treat modifiable factors that contribute to cardiovascular disease in children.

Definition

Anaemia is defined in terms of the haemoglobin (Hb) concentration or haematocrit (Hct). The mean normal values of Hb and Hct for the healthy is given in Table 1.

A work up for anaemia in patients with CKD should be initiated when the,

- Hb < 11g/dL (Hct <33%) in pre-menopausal females and pre-pubertal patients
- Hg < 12g/dL (Hct 37%) in adult males and post-menopausal females [3].

Table 1 - Mean normal values of haemoglobin and haematocrit for the healthy, normal population [3]

Age / Gender	*Haemoglobin (g/dL),*	*Haematocrit (%)*
Birth	16.5 + 3.0	51 + 9
1 month	14.02 + 4.0	43 + 6
2 to 6 months	11.5 + 2.5	35+ 7
6 months to 2 years	12.0+ 1.5	36+ 3
2 to 6 years	12.5 + 1.0	37+ 3
6 to 12 years	13.5 +2.0,	40+ 5
12 to 18 years (male)	14.5+ 1.5,	43+ 6
Menstruating female	14.0 + 2.0	41+ 5
Adult male/post-menopausal female	15.5 + 2.0	47 + 6

Causes

The pathogenesis of anaemia in CKD is multifactorial.

1. Decreased production of erythropoietin (EPO) by the diseased kidney is the primary cause.
2. Bone marrow suppression by uraemic toxins and hyperparathyroidism.
3. Deficiency of iron, folate and vitamin B_{12}
4. Reduced red blood cell survival.
5. Blood loss due to - Frequent blood sampling, gastrointestinal bleeding and haemodialysis.
6. Drugs – ACE inhibitors, angiotensin receptor blockers, theophylline
7. Chronic infection or inflammation.
8. Aluminium excess.
9. Underlying haematological disorders.

Complications

When untreated, anaemia reduces O_2 delivery to tissues resulting in a number of physiological adaptations such as modulation of the affinity of Hb for O_2, increase in cardiac output and redistribution of blood flow from the skin to other organs. Increased cardiac output leads to cardiac enlargement, left ventricular hypertrophy and ventricular dysfunction. Reduced cognition, impaired mental acuity, growth failure, accelerated annual decline in GFR in adolescents, and impaired immune response are other complications known to occur in these patients [4].

Clinical manifestations

The symptoms and signs of anaemia in patients with CKD are non-specific and may be difficult to distinguish from those due to uraemia. These include loss of appetite, feeding problems, reduced exercise capacity and breathlessness on exertion or at rest, palpitations, and menstrual irregularities among adolescent girls, impaired growth, poor memory and concentration ability leading to reduced school performance.

Investigations

Patients with a GFR <60 ml/min/1.73m^2 should be initially screened for the presence of anaemia by measuring Hb concentration. If it is <11g/dL in pre-pubertal children, a workup should be initiated with at least the investigations mentioned in Table-2 to determine whether the anaemia is due to CKD or not [5]. An automated cell counter should be used to determine RBC indices, Hct and Hb because the results are more easily standardized. It also has the advantage of providing a total white blood cell count and a platelet count.

Table 2 - Evaluation of anemia should consist of measurement of at least the following [5]

Hemoglobin (Hb) and/ or Haematocrit (Hct)
Red blood cell (RBC) indices
Reticulocyte count
Iron parameters:
• Serum iron
• Total Iron Binding Capacity (TIBC)
• Percent transferrin saturation (TSAT)
• Serum ferritin
(TSAT = Serum iron × 100 divided by TIBC)
A test for occult blood in stool
This work-up should be performed before erythropoietin therapy is begun.

The anaemia of CKD is generally normocytic normochromic. The presence of microcytosis may reflect iron deficiency and aluminium excess whereas macrocytosis may reflect vitamin B_{12} or folate deficiency and/or erythropoietin therapy shifting immature, large reticulocytes into the circulation. Iron deficiency reduces serum iron concentration and lowers TSAT to < 20%. It increases red cell distribution width, TIBC and serum ferritin (>100 mcg/L) [3].

Serum ferritin is an acute phase reactant and is elevated in infection and/or inflammation. Measurement of C-reactive protein (CRP) level would be helpful to exclude these factors which cause an elevation in the ferritin level.

Management

The cornerstones of treating anaemic children with CKD include erythropoietin therapy, iron supplementation, treatment of gastritis, suppression of hyperparathyroidism, minimising blood loss during blood sampling and adequate nutrition.

The target range for haemoglobin (haematocrit) should be Hb 11 g/dL (33%) to Hb 12 g/dL (36%) [3]. This target is for erythropoietin therapy and is not an indication for blood transfusion [3].

Iron should be supplemented to prevent iron deficiency and to maintain adequate stores. Iron can be given orally or intravenously (IV). Oral iron should be given at a dose of 2-3mg/kg/day of elemental iron in 2-3 divided doses [3,6]. Oral iron should best be given with food to prevent side effects such as constipation, diarrhoea, nausea and abdominal pain. If compliance is poor due to side effects, the dose can be reduced.

However, oral iron therapy may not be sufficient for correction of anaemia in end stage renal disease. In such patients, parenteral iron is necessary to optimise iron status. Intravenous iron therapy is superior to oral iron supplementation [7]. It can be given safely to CKD patients [8] if international recommendations and guidelines are followed [3, 5]. Before administering the first dose to a new patient, a test dose of intravenous iron should be given. Potential side effects associated with intravenous iron therapy include acute allergic reactions such as rash, dyspnoea, wheezing or even anaphylaxis, as well as long term complications caused by generation of powerful oxidant species, initiation and propagation of lipid peroxidation, endothelial dysfunction, propagation of vascular smooth muscle proliferation, and/or inhibition of cellular host defence [9]. The preparations available for intravenous administration are iron dextran, iron sucrose and iron gluconate. Iron dextran therapy is associated with a higher risk of allergic reactions than other preparations whereas iron sucrose carries the lowest risk. According to the package insert, iron gluconate has not been established to be safe and effective in paediatric patients [3].

Iron status should be monitored by the TSAT and the serum ferritin [5]. CKD patients should have sufficient iron to achieve and maintain Hb of 11 to 12 g /dL and Hct of 33% to 36% [3]. To achieve and maintain this target Hb and Hct, sufficient iron should be administered to maintain a TSAT of >20%, and a serum ferritin level of >100mcg/L [3].

If no cause for anaemia other than CKD is detected, and the serum creatinine is >2.2mg/dL, anaemia is most likely to be due to erythropoietin deficiency [3]. Erythropoietin treatment has dramatically improved the life of the child with end-stage renal disease. It is beneficial and safe in the pre-dialysis period, during haemodialysis or peritoneal dialysis and after renal transplantation. It is administered subcutaneously (SC) in pre-dialysis, peritoneal dialysis and haemodialysis patients although may be given intravenously (IV) in the latter group to avoid pain. A starting dose of recombinant human erythropoietin (r-Hu EPO) of 50 U/kg subcutaneously twice weekly is effective and safe for the majority of children with anaemia of chronic renal failure [10]. However, children below 5 years of age have shown to require higher doses (300 units/kg/wk) than older children [3]. Correction of anaemia with r-Hu EPO has not been shown to improve the growth of children with chronic renal failure [11].

The side effects of r-Hu EPO therapy are hypertension, iron deficiency, hyperkalaemia, arteriovenous fistula, thrombosis, clotting within the extracorporal circuit, thrombocytosis, hyperphosphataemia and headache.

Inadequate response to r-Hu EPO therapy should be evaluated. The commonest cause is iron deficiency. Other causes are infection, inflammation, chronic blood loss, osteitis fibrosa, aluminium toxicity, folate deficiency, vitamin B_{12} deficiency, malnutrition and haemolysis. An elevated C- reactive protein level indicates the presence of infection or inflammation.

Blood transfusions are best avoided unless absolutely necessary as it may result in alloimmunization of the recipient resulting in graft rejection following kidney transplant. Also, blood transfusions carry the risk of transmission of HIV, Hepatitis B and C infections. Repeated blood transfusions can cause haemosiderosis which may need chelation therapy.

Attention should also be paid to adequate nutrition including folate and vitamin B_{12} intake and suppression of secondary hyperparathyroidism.

In conclusion, early treatment of anaemia in CKD has shown to reduce cardiovascular disease and blood transfusion requirements with an improvement in exercise tolerance, cognitive functions and quality of life [12,13].

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Integrated Medical Curriculum: need of introducing clinical medicine in the first year of teaching

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Throughout the world the undergraduate medical curricula are constantly being revised. This has become a necessity for survival of the medical schools as the expectations on the quality of the graduates are ever increasing.

The General Medical Council of UK (GMC) expects very high quality from the medical practitioners as it is stated in the document 'Good Medical Practice 2006.' It states "Patients need good doctors. Good doctors make the care of the patients their first concern: they are competent, keep their knowledge and skills up to date, establish and maintain good relationships with patients and colleagues, are honest and trustworthy, and act with integrity" [1]. This statement clearly shows high standards of expectations. The medical education should be revolutionized to achieve these goals. The GMC recommended that basic scientists and clinicians would have to get together and integrate their teaching, eliminating the pre-clinical and clinical divide. It also suggests that the examinations would also have to change, warns the GMC, as they "currently put a premium on the acquisition of facts at the expense of reasoning" [2].

Benchmark statement for medical graduates of Sri Lanka identifies professional values, attitudes, behaviour and ethics, scientific foundation of medicine, communication skills, clinical skills, population health and health systems, management of information as the key areas a medical graduate should develop his or her knowledge and skills [3]. The diversity of relevant areas covered in this document demands the medical educators to change the approach as all the aspects mentioned in the bench mark document are not consciously addressed in existing traditional curricula.

The medical faculties in Sri Lanka have already started adopting new curricula to face the new challenges of education. Medical faculties in Colombo, Peradeniya and Kelaniya Universities have already given up the traditional curricula to adopt a modular system either of problem based or system based.

The medical faculty of the University of Ruhuna is also in the process of changing its traditional curriculum. Surveys conducted by the Medical Education and the Staff Development Unit among the academic members of the extended faculty and the recent graduates of the faculty, show that all of them agree that a more extensive integration is needed in the curriculum.

The curriculum could be defined as made up of all the experiences learners have that enable them to reach their intended achievements from the course [4]. A curriculum should be enriched with teaching learning experiences which should be powerful enough to produce desired learning outcomes.

It is important to understand that the education is not mere acquisition of information. It is a way of interacting with the world, which should bring out the desired change in the learned person. Mere acquisition of information will not bring the expected change but the way we structure that information and think with it does will make the necessary conceptual change in the learner [5].

As the expectations of the public on the quality of the doctors are ever increasing, the medical schools face a formidable challenge to review the curriculum and make necessary changes to meet these demands. Integration of curriculum played a major role in these changes since it was fist tried in Case Western Reserve Medical School in Cleveland, Ohio in 1952. Since then, lot of

changes have taken place with a move from the traditional curriculum towards system based integration and to problem based curricula.

In the process of integration, it is important to think about all the aspects identified in the subject bench mark document. It is not just integration of basic sciences and clinical skills as it thought to be. The integration could be more clearly and broadly defined as the integration of component parts of science and clinical experience, knowledge, skills and attitudes, judgment and problem solving and even of continuing to learn through reflection on practice [6]. Above statement clearly shows the importance of introducing clinical practice at a very early stage in the carrier. It is beneficial as everything students learn could be related to the clinical practice. This will facilitate the process of student learning as it will show them the appropriateness of what they are learning and it's relevance to the learning outcomes. Most of the theories of learning support this type of approach.

It is difficult to discuss extensively about learning theories in an article like this. Our idea is to introduce few of the well known learning theories to show the importance of early integration and its impact on the system.

Knowles' theory of andragogy is an attempt to develop a theory specifically for adult learning. Knowles emphasizes that adults are self-directed learners and expected to take responsibility for decisions. Andragogy assumes that the adults need to know why they need to learn something, and they learn by experiencing. Adults' approach to learning is as problem-solving and adults learn best when they see the immediate value of what they learn. In practical terms, andragogy means that instruction for adults needs to focus more on the process and less on the content being taught. Strategies such as case studies, role playing, simulations, and self-evaluation are most useful [7].

It shows that adults prefer to learn what is relevant to them on their own; hence, the early experiences with clinical medicine will be beneficial. Other educational theories among many which support the fact that early integration is required are the theories of constructivism and situated learning.

In the theory of constructivism, learners construct their understanding of the world through their interaction with it and that the learning can occur when new experiences of the world fit into learners existing cognitive structures. New learning experiences should be modified to fit into the existing cognitive structure [8]. The guiding principles in constructivism include that the learning is a search for meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning and the meaning requires understanding **wholes** as well as parts, and parts must be understood in the context of wholes. Therefore, the learning process focuses on primary concepts and not on isolated facts [9].

Introduction of clinical medicine in the pre-clinical period should be done in a graded way to fit into the cognitive development of the students for them to assimilate new knowledge. It will help them to understand pre-clinical subjects as a part of the whole. This will give a meaning to education and will enhance learning. This will create a situation where learning will become an activity in which they are involved.

In the theory of situated learning, J. Lave argues that learning as it normally occurs is a function of the activity, context and culture in which it occurs.[10] The principle of using situated learning theory is knowledge needs to be presented in an authentic context, i.e., settings and applications that would normally involve that knowledge and the learning requires social interaction and collaboration [10]. Most of the other learning theories as well support the case of early introduction of clinical skills. It has shown in studies that early introduction of clinical medicine enhances the students learning interest and made them feel like doctors [11].

It must be appreciated that the first year is the hardest period for students as during this period they will have to learn a whole lot of new concepts in new fields. This will become more difficult for them if they can't appreciate the relevance and importance of what they are

learning. They will need constant explanation on why they should learn all these [12]. Through introduction of clinical medicine in the first year they will understand the relevance of basic concepts of Physiology, Biochemistry and Anatomy making it a meaningful learning experience.

It is important to pay a meticulous attention on the teaching learning methods in which the clinical medicine is introduced to the first year students. Mere supplementation of an anatomy or a physiology lecture with a demonstration of a patient will not be enough to bring out the desired outcomes of integration. The teaching learning activities should really integrate component parts of science and clinical experience, knowledge, skills and attitudes, judgment and problem solving and reflection on practice. To achieve this all sorts of active teaching learning strategies such as small group discussions, debates, role play, authentic projects, small scale research and attending to patients have to be incorporated into the first year teaching. This will help to change the learning styles of the students by encouraging active participation and will help to achieve some of the goals mentioned in the bench mark statement.

In a recent visit authors have personally experienced how the clinical medicine is successfully incorporated in to phase 1 medical curriculum as a case led framework in Durham University, UK. The students start the course with a foundation case through which they learn molecular and cellular basis of the disease, how it affects the physiological functions within the body and its effects on the individual, family and the society. This will lead to more case led study of other selected important topics. In addition, there are projects in which they are allocated to families where there is a patient with a chronic illness. They have several lecture demonstrations in which they get opportunity to interview patients and visits to the hospital with very clear learning objectives, during which they are guided by the senior students. The objectives of the lectures are directly related to the clinical practice.

The medical faculty of the University of Ruhuna has already introduced the foundation module which covers areas such as communication skills, medical ethics, humanities and IT skills. Through the foundation module, students are exposed to a whole lot of new teaching learning methods. There are lots of group activities, projects, presentations and interviews through which students have opportunities to develop their learning skills which enhance active learning. This will provide a good foundation to introduce active learning methods which are properly integrated with clinical medicine fairly early in the training program. This will definitely make the students better learners as this approach will make learning a more meaningful experience.

The authors believe that the existing curriculum could be improved remarkably by introducing new teaching learning sessions related to clinical practice of medicine. At least in the initial stages, certain percentage of teaching learning activities could be properly integrated. In the meantime, the assessment methods should also be changed accordingly. Further steps towards more extensive integration could be taken depending on the feedback. This is an essential step in developing a quality medical graduate.

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Augmentin

Behaviour therapy for medical practice

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Clinicians use various treatment methods to treat their patients. Pharmacological treatment is the main treatment method used in western medical practice. Therefore, during the five year training of a medical undergraduate, significant time is spent acquiring knowledge in pharmacology. Once graduated, doctors acquire skills in prescribing medicines to various illnesses as mono-therapy as well as combination treatment.

Surgical skills, too, are given some emphasis during undergraduate training period and those who work in surgical units acquire surgical skills during the internship.

The responsibility of a medical officer to his patient does not end there. In addition to prescription of medicine and surgical interventions, patients expect their doctors to advise them regarding food, health habits and handling behaviour patterns of children. During early parts of the medical undergraduate training, undergraduates get an adequate input on food and nutrition. This is useful for doctors when they have to advise patients regarding food and nutrition. It is my personal experience as a clinical teacher that out of all the skills required by a medical officer, behaviour management methods are given no or very minimal attention during undergraduate training. It is not common for young doctors to acquire knowledge in behaviour therapy principles or skills in behaviour therapy techniques during early parts of their career because only few of them get exposed to clinical settings where behaviour therapy is routinely practiced. Therefore, I believe that majority of the doctors continue to have limited knowledge and skills in behaviour therapy techniques useful for their clinical practice as well as for day-to-day life.

Children and child rearing becomes important part of life in a majority of doctors some time in their lives. It is a known fact that nobody gets any training in "parenting". We all rear our children without having any training or scientific knowledge in parenting or behaviour therapy techniques useful in parenting. The chances of people practicing wrong or harmful behaviour modification methods with children, therefore, are high.

What is behaviour therapy?

Behaviour therapy is use of various behaviour techniques by the therapist or a person to achieve modification of behaviour of another person. This could be behaviour of a child, adult or an animal. Behaviour therapy is based on an assumption that most behaviours are developed and maintained on learning principles [1].

Specific behaviour therapy techniques are derived from each of the four types of learning**: respondent conditioning, operant conditioning, cognitive behaviour modification, and social learning [1]**.

The principles of "respondent learning" is the most widely known. Respondent conditioning is based on the observation that certain behaviours known as respondents are elicited involuntarily as response to certain stimuli. This was first demonstrated by Pavlov using his experimental dogs [2]. Respondent conditioning in humans was first demonstrated by Watson and Raynor (1920) in their experiment with Albert, an 11 month-old infant [3]. After allowing Albert to play comfortably with a furry white rat, the experimenters started to startle Albert with a loud noise whenever he began to play with the rat. After only seven pairings Albert's pronounced startle to the noise was capable of being elicited exclusively by the sight of the rat, thus revealing a conditional fear response.

Another form of learning is "operant conditioning". It is based on Thorndike's observation that behaviour is strengthened or weakened by its consequences [4]. Skinner termed such behaviours "operants" because they operate on the surrounding environment to generate consequences. Thus behaviour that is followed by pleasant consequences is likely to increase in frequency, whereas behaviour followed by unpleasant consequences is likely to decrease in frequency. Skinner argued that most human behaviours are operant in character and he advocated that the principles of operant conditioning be used to solve many types of behaviour problems [5]. This approach is known as applied behaviour analysis in modern behaviour therapy.

The third type of learning is "cognitive behaviour modification". Basic assumption in cognitive behavioural approach is that cognitive processes (eg: attributions, cognitions, expectations and beliefs) influence one's behaviour and affect. Irrational and faulty cognitive processes foster the development of maladaptive behaviour patterns that are best reversed directly through the modification of maladaptive cognitions. Cognitive restructuring and problem solving are common tools used by cognitive behavioural therapists to correct maladaptive cognitive processes that are believed to cause behavioural problems [6].

"Social learning theory" describes the fourth type of learning. Social learning theory attempts to integrate the two types of conditioning theories with our understanding of cognitive processes. According to Bandura (1977) learned behaviour is governed by three types of regulatory processes: paired stimulus-response events (as in respondent conditioning), environmental consequences (as in operant conditioning) and symbolic cognitive processes. The most important among these are cognitive processes, and particularly those that involve observational learning, a process in which behaviour change occurs by observing a model. For example, a child who views another child being rewarded for a particular behaviour is more likely to perform similar behaviours [7]. One of the distinguishing characteristics of social learning theory is that it emphasizes the person's capacity for self-directed change.

Concept of behaviour therapy in medical practice is commonly used for handling behaviour problems of children and adolescents by those who handle such problems. But as I mentioned earlier, it is important for all the medical officers to have some knowledge in behaviour therapy principles and techniques not only to use in clinical practice but for the own needs of handling their children.

There are various behaviour therapy methods that can be used to improve behaviour of a child. The techniques can be categorized as attempting to produce either of two kinds of behaviour changes; (i) to strengthen, develop or maintain a good behaviour and (ii) to reduce or eliminate unacceptable behaviour.

Techniques to strengthen, develop or maintain behaviour

In operant conditioning, reinforcement is the process by which behaviour is strengthened by it's consequences. In the case of positive reinforcement, a reward (or reinforcer) is presented after the occurrence of the desired behaviour. The purpose of reinforcement is to increase the likelihood of that particular behaviour to be repeated.

Reinforcers can be tangible, involving material items, such as food, money, privileges, and opportunities to engage in specific activities or behaviours or removal of sanctions. Reinforcers can be intangible too, involving social or related items such as encouragement, praise, smile, appreciation etc.

Let me explain this using an example from day-to-day life. A child who finishes his homework will get as a reward to watch his favourite cartoon or to go and play cricket with friends, once he finishes doing his homework. If this is the practice, child will quickly learn that, by choosing to do the homework in time, he gets the chance to watch his favourite cartoon or to go and play cricket. Once this is learnt, the chances are that child does the homework without making a

big fuss because he thus chooses to watch cartoon or to play cricket.

How often do you reinforce the desirable behaviour? This can vary. Reinforcement that is administered immediately after each time a desired response occurs is known as *continuous reinforcement,* when reinforcement is administered intermittently it is called *intermittent reinforcement.* The rate at which reinforcement is administered varies randomly in *variable reinforcement*. In general, learning that results from intermittent schedules of reinforcement, specifically, variable reinforcement is more stable. They are more difficult to change than the behaviours acquired through continuous reinforcement. Compulsive gambling is a good example. Gambler is reinforced with money as a reward in variable interval and it is very difficult to unlearn.

Conditioned reinforcement is also used to strengthen, develop or maintain behaviour. In conditioned reinforcement, a particular stimulus - the conditioned reinforcer - signals the likelihood that reinforcement is forthcoming. Over time, the stimulus itself becomes reinforcing (it becomes conditioned) because of its association with the receipt of reinforcement. Thus parental praise is a conditioned reinforcer because it signals the likelihood that other reinforcers such as food, privileges, affection etc are forthcoming.

Tangible conditioned reinforcers that can be earned and exchanged for other reinforcers are typically referred as "*Tokens*". A good example is certain number of red stars earned by a child for exhibiting a particular good behaviour, later can be exchanged to get a trip to beach, a cartoon CD or a toy.

Modeling represents a behavioural change technique that involves having a child observe a model engage in a particular sequence of behaviour for the purpose of producing behaviour change. This could be live, symbolic or participant. In live modeling the child observes a model engage in target behaviour *in vivo*; in symbolic modeling the child views the model on film or video. One has to be concerned about what children see in TV commercials and the possible impact of them on behaviour of children with this modeling concept in learning.

Techniques to reduce or eliminate behaviour

In operant conditioning *extinction* refers to the process in which reinforcement is withheld after an operant response so as to reduce the frequency of its occurrence. Undesirable behaviours usually increase in frequency for a brief period immediately after the introduction of an extinction procedure, although gradually they disappear in the absence of reinforcement. A child who screams when his demands are not met and parents responding him by giving in to his demands to stop his screams, will increase screaming initially when parents do not respond but gradually his screaming will disappear if parents continue to withhold giving in to his demands.

Punishment is a technique used to eliminate undesirable behaviour through the introduction of an aversive stimulus or removal of a positive stimulus after operant response. Scolding, spanking or removal of privileges (eg: watching television, going out to play) are examples of punishment, if these are presented contingent on a child's behaviour and reduce the frequency of that behaviour. Punishments usually bring about rapid decrease in the frequency of problem behaviour, thus making them particularly effective technique for the reduction of self injurious behaviours and certain disruptive behaviours. Punishment has many disadvantages, it tends to suppress behaviour temporarily rather than actually change it.

There are various techniques used to achieve behaviour modification by behaviour therapists, based on some of these basic principles of behaviour modifications. It is useful for any person to be aware of the basic principles which will be useful in day-to day life problems as well as in clinical work.

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Learning by research

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Most medical curricula of undergraduate and postgraduate training include research as a component in their teaching process. Research is defined as a systematic investigation and study of materials and sources in order to establish facts and reach new conclusions [1].

Students are expected to carryout research in the form of original work and produce a dissertation. In the undergraduate level it is being done in small scale and in postgraduate level it is a comprehensive work leading to the discovery of new knowledge to the relevant sciences.

What is the purpose of this whole endeavour? When students are trained to do a particular job in Medicine, is it essential to ask them to do research? Why not it be left to the professional researchers and allow the students to engage in more professional training sessions? Answers to these questions can be found by looking at the different learning outcomes achieved through research activities.

Research is an integral part of leaning in Medicine as it provides the student with cognitive, emotional, social and practical experience that helps in developing their knowledge, skills and attitudes. It might be difficult to teach all these qualities by didactic lectures, tutorials, discussions and ward classes. Therefore, research is an essential part in learning Medicine that has to be well structured and supported by the institution and the curriculum.

Active learning in Medicine and research

The active learning process in Medicine involves student-centered or self-directed learning through their accumulated knowledge and experience, supported by academic members, clinicians and peer interactions [2]. This experience provides a foundation for active learning. Research is active learning which provides the students (undergraduate or postgraduate) an opportunity to make observation, reflect on their experience and analyse ideas they have accumulated through their work and experience. These ideas will eventually lead to the formation of "concepts" or "theories" (assumptions) that can be tested through active experimentation. This will make way to new knowledge and experience. This process starts again and works as a cycle. This cycle of experiential learning is known as Kolb's learning cycle (Figure 1) [3].

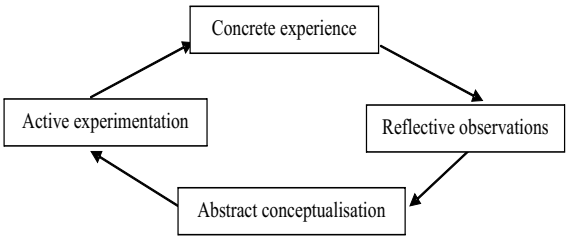

Figure 1 - Kolb's learning cycle [3]

The new experiences generated through different types of learning will reflect on new observations that lead to new concept formations. Concepts have to be subjected to experimentation to prove. This is active learning and learning by research.

Learning through different components of research

A research project consists of a range of stages, starting from the selection of a topic to writing conclusions. Each one of these stages helps students (researchers) to acquire new knowledge skills and attitudes in their learning development (Table 1).

Table 1 - Knowledge, skills and attitudes developed through research [4]

Research stage	*Experiential learning process*	*Knowledge gained*	*Skills gained*	*Attitudes developed*
Deciding on a research topic and objectives	Reflection on past experience	Developed from lectures, books, discussions. Application of knowledge to critical incidence analysis	Handling of information and retrieval	Being enquiring and exploratory
Finding the relevant information of the selected subject (Literature search)	Reflection and conceptualisation	Through knowledge on core subjects and its critical analysis to develop as a research & understanding past research	Literature search, computing skills including web search	Being methodical and being explorative
Designing methodology	Conceptualisation	Knowledge on proper methods of how to do a research. (e.g. Different epidemiological study types)	Designing questionnaires, data bases and consent forms. Sample selection budgeting and managing	Being thorough Reaching targets, Obtaining guidance from supervisors
Field work	Active experimentation	Practical knowledge on the subject matter, identify practical problems	Collecting data, communication skills, skills in facing problems, Leadership	Being careful about the application of a protocol
Data analysis	Reflection and conceptualization	Knowledge and critical analysis of results to find new information and relationships	Data entering skills, use of statistical packages	Being methodical
Writing results and discussion	Active experimentation and reflection	Knowledge on new findings and results that will reflect on new knowledge added to the main stream	Comparison of results with others, writing skills, interpretation of data, critical thinking	Being truthful about results, appreciation of limitations, being reflective
Writing conclusions	Experience and reflection	Knowledge on what has been performed and what has to be performed in future.	Writing skills Critical appraisal	Being practical and innovative

Concrete knowledge, past experiences and appreciation of challenges will lead to exploring of areas of a research topic. The topic should be of interest to the researcher, stimulating and relevant. This process includes sharing of views with peers, staff and experts in the relevant field. Everybody in this process contributes to this reflective process. The researcher has to be thorough with the relevant core knowledge and should be able to carefully develop the research objectives. Good supervision and well designed curriculum will help students in this process.

Once a topic is selected, students are expected to do a literature review. With the literature review, students get familiarised with the core subjects and learn how to critically evaluate the past research. They become more methodical and

explorative. A clear view about the subject will reflect in the development of research objectives properly. Stating the objects clearly is a very important point in research development.

Once the objectives are formulated the learning process continues from reflection to conceptualization. The researcher begins to think about the best method of finding the solutions for his research questions or specific objectives.

At this point a researcher has to decide on several issues,

- Design of the study. What epidemiological study type has to be used? Qualitative, Quantitative or both.
- Best method for collecting data.
- Sample size, time frame, budgets and consent process.

By doing this the students' knowledge and experience is applied to conceptualisation process.

Good supervision is mandatory at this point for the students to become more practical and realistic in doing the research.

Learning at experimentation stage

This is the most exciting part of a research. The field, laboratory, or clinic work integrates the knowledge and skills of the students into a practical application. Researchers learn to get the work organised, train others and supervise them, collect, organise and manage data. They learn the statistical methods of organising data. This will lead to new experiences and help to develop the process of "learning by doing".

As the research continues, the learning process also continues further. The analysis of data and writing up of the dissertation lead to new ideas and views. Therefore, the learning process of reflection and conceptualisation continues. This is an important educative process where students try to compare their findings with the experiences of the others and their pre-conceptions, fallacies and doubts are challenged. This whole process is a unique learning opportunity. This may be the first time students face the challenge of writing and describing their own findings and making recommendations. This experience will help students to develop confidence on their own work. That will serve them to develop leadership qualities.

Institutional role

Institutions have an important role to play in this whole learning process. The institution should provide the student with the necessary subject knowledge. This has to be embedded in its curriculum. There should be opportunities for the students to develop skills, attitudes, communication skills, and interpersonal relationships through courses, workshops, etc. The institution should provide the right environment for the students to engage with research projects (libraries, computers etc.).

Proper guidance and advice should be given by the supervisors. At the same time, a close observation should be maintained to find whether the ethical guidelines are followed by the students. It is necessary to closely watch the deadlines, targets, progress reports etc. This will help the students to develop their attitudes of being honest and being practical.

In educational settings "learn by doing" is considered a very powerful tool of teaching. "Learn by research" in medical settings has also become a very important tool in both undergraduate and postgraduate levels today.

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Medical expert witness: persistent challenge unexplored

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Medicine and law are two contrary subjects though both subjects have their ramifications towards each other. Law analyses human behaviour in an objective manner and medicine has relativity of human life as one of its spheres. Both subjects are evidence based but the range of evidence "medicine" relies is far wider. The fundamental tool used in law is "words" and in Medicine is the knowledge based skill. Nowadays doctors are increasingly called to give evidence in courts and its one of the most unfavoured tasks for many of them. Some doctors find themselves uncomfortable in courts and criticize the way they were questioned and the time spent to give evidence. Our attempt here is to evaluate doctor's role in courts and trying to understand the nature of legal argument levelled against medical evidence which is not palatable to medical fraternity most of the time.

It is essential to analyse the role of expert witness in courts before assessing doctor's role. As all medical doctors are often not called upon to give evidence they may loose skills of evidence presentation in courts. Forensic practitioners withstand fierce cross questioning purely because of their extensive experience in court work. It is not mandatory for doctors performing medico-legal work in Sri Lanka to possess legal qualifications. In fact most of them do not have legal qualifications unlike in UK and Australia. What is required for doctors is having a sufficient exposure on the skill and art of giving expert evidence in courts. Unfortunately most of them are not adequately trained on giving evidence at present. They do get an opportunity to listen an expert evidence presentation during undergraduate training or when they are junior doctors.

According to S. 45 of Sri Lankan Evidence Ordinance "When the court has to form an opinion as to foreign law, or of science, or art, or as to identity or genuineness of handwriting or finger impressions, palm impressions or foot impressions, the opinions upon that point of persons specially skilled in such foreign law science or art, or in questions as to identity or genuineness of handwriting or finger impressions, palm impressions or foot impressions, are relevant facts [1]. Such persons are called experts. The S. 45 has some illustrations to clarify the role of expert witnesses and some of these are having medical relevance.

Illustration

(a) The question is, whether the death of **A** was caused by a poison.

The opinion of experts as to the symptoms performed by the poison by which **A** is supposed to have died are relevant.

(b) The question is, whether **A** at the time of doing a certain act, was, b y reason of unsoundness of mind, incapable of knowing the nature of the act, or that he was doing what was either wrong or contrary to law.

The opinions of experts upon the question whether the symptoms exhibited by **A** commonly show unsoundness of mind, and whether such unsoundness of mind usually renders persons incapable of knowing the nature of the acts which they do, or of knowing that what they do is either wrong or contrary to law, are relevant.

The subjects referred to in the S. 45 are Foreign Law, Science, Art, Handwriting, Fingerprints, Palm prints & Foot prints. It has no reference to Medicine or any specialised medical field. The Indian Evidence Act also carries an identical section [2]. The whole medical field is represented as a sub category of "science" which

is inappropriate according to modern standards. This section is clearly out of date with regard to categorisation of experts and need a major revision. It is the Court that decides as to whether a person is an expert or not. Acquisition of special knowledge need not be the result of professional training. Necessary academic and professional qualifications are not absolutely essential. What the court requires is special skill by reason of practical knowledge and experience. However qualified, knowledgeable and experienced an expert may be, the court is not bound to accept the opinion of an expert. The court may form its independent opinion. Expert opinion is only opinion evidence and is not helpful to the court in interpretation of the law [3].

The Court considers a Medical Officer with MBBS or its equivalent as an expert. However this is limited to give opinions as regards to the ordinary day to day matters. In certain situations the court may hold that a medical officer is not an expert. Given below are two examples.

(a) An inexperienced medical officer doing a complicated autopsy and giving opinions thereon.

(b) Medical Officer expressing opinions in special areas such as ballistics, explosions, surgical procedures, serology etc.

The degree of expertise of a medical doctor varies with the qualifications and the skills possessed by him. A MBBS doctor and specialist doctor in a certain field are treated differently in courts as their level of expertise lie in different strata. The senior doctors should be humble enough to admit mistakes (although not intentional) they have done when they were junior doctors.

Privileges of an expert

An expert witness is entitled to state facts and express opinions on these facts. An ordinary witness can speak only to facts and cannot give opinions.

The evidence of an expert witness may be in the form of a report like a Post-Mortem Report (PMR) or Medico-Legal Report (MLR) which may be accepted by courts without calling him to testify under Section 414 of the Criminal Procedure Code Act whereas an ordinary witness must testify in court under oath.

In non-summary proceedings an expert witness cannot be summoned to court to give evidence without the consent of the Attorney General under section 148 of the Criminal Procedure code Act.

He is given a special seat in the well of the court and is allowed to remain in court when other ordinary witnesses are giving evidence. He may make arrangements with the Court to be present at a particular time to give evidence.

Bed Head Ticket (BHT)

Bead Head Ticket is the most important and the preliminary medical document all doctors in Sri Lankan medical institutions are dealing with. However, some of our doctors fail to appreciate that it is the most important legal document in a clinical setting. The majority of BHTT can be of poor quality due to adoption of substandard practices, illegible handwriting, poor recording of facts etc. This is mainly due to minimal attention paid by medical officers to the proper maintenance of a BHT. Any medical officer from a house officer up to consultants of various specialities and medical administrators could be called to give evidence based on BHTT for various reasons. It is very important to enter all details in a BHT with date and time accordingly. Doctors should never attempt or promote the practice of altering facts/comments already recorded in a BHT. They should also remember that obtaining consent of patients for various treatment/procedures on the admission sheet of a BHT is a highly invalid procedure which should be abandoned.

Guidelines to be an effective medical expert witness

Medical Evidence presentation in courts is a verbal battle. It starts smoothly when prosecution testifies your evidence and gets heated up when defense counsel starts cross examination.

Lawyers have a different stance. Some are aggressive and some are soft spoken. Doctors are usually soft spoken in courts. It is our experience that most doctors other than full time JMOO are incapable of handling their mother tongue, Sinhala when giving evidence.

Language fluency is an essential factor for good evidence presentation as tactful lawyers always bisect your words and go deep into the meaning. In Sri Lankan set up most medico-legal reports and PM reports are written in English and expert evidence is obtained in Sinhala or Tamil. Doctors feel more comfortable when they use English to describe medical points rather than their own language. Due to this fact they can be trapped when explaining difficult medical terms or procedure in courts. The best possible way to overcome this difficulty is to go through his report before the trial with a colleague used to court work.

(1) Respect the Court of Law

   (a) Obey summons either to attend Court of Law or to send a report. Inability to do so should be informed promptly to court giving reasons.

   (b) Be punctual. If getting late inform Court of Law, for court will accede to your request as they are aware that medical officers are quite busy.

   (c) Be properly clad. The males must wear a coat & tie and the females a saree.

   (d) Never leave court without informing relevant authorities or obtaining permission from them.

(2) Be polite to the Judge, prosecuting counsel, defence counsel and other court officials.

(3) Never lose your temper however much you may be provoked, especially by the defence in cross examination. Always be calm. Appeal to the Judge if personal matters irrelevant to the case are raised by the counsel. The moment you loose your temper you are on the verge of making misrepresentation of facts. Remember that you are involved in a verbal battle. Good defence lawyers are usually better equipped with words and waiting there for you to make a mistake. Be very careful when you are giving affirmative answers. Use your words carefully as all verbal arguments are recorded.

(4) Always remember that you are a witness of court and not a witness of either the prosecution or the defence who may have called you as a witness.

   Your duty is to assist court to find the truth. Therefore give independent, impartial & truthful evidence. **The outcome of the trial should not be your concern.** Remember that you are not battling out your own case. It is applicable even when you are called upon to give expert evidence in medical malpractice litigation involving your colleagues in medical profession. This may be a very difficult attitude to perceive at the initial stages of your carrier. A medical expert witness plays an essential role in determining medical negligence [4]. It may be advisable to avoid being an expert witness against one of your colleagues working in the same hospital.

(5) Should possess sufficient skill and knowledge according to your qualifications and experience.

(6) Should know the limitations, pit falls and short comings in your skill and knowledge and be ready to admit them.

(7) Evidence should be logical, clear, reasonable, complete and in a language understood by Court. Avoid technical terms as much as possible. Fluency in native languages is very important as all primary and many secondary courts use official languages in Sri Lanka.

(8) Be ready with your documents like notes, reports, charts, diagrams and illustrations. The Court may need to peruse them.

(9) Support your opinions with experience, publications and text books. It is a good practice to take photocopies of the material you are expected to quote to the courts as

the opposite counsel and perhaps the judge may ask for copies of it.

(10) It is a good practice to discuss your case report with your colleagues in an open forum before going to courts. Their constructive criticisms may be helpful for you to clear the grey areas and to further the insight into the case. Never hesitate to discuss with your colleagues. Court cases are not personal issues and your evidence becomes a public statement soon after you step into the witness box. Lack of peer reviewing is one of the major deficiencies encountered by our medical testimonies.

(11) If you contradict another expert, always justify it with any special knowledge, research, experience, publications, texts etc. Do not state any personal issues. If you need more time to quote the extracts ask for another date.

(12) Be firm in your convictions. Never give evasive answers or sway from side to side to suggestions put to you by either party to support their cause in examination in chief, cross examination or re-examination.

(13) If you do not know the answer to a question put to you always say that you do not know the answer and never give a false answer. It is more important to maintain your professional integrity rather than battling out individual situations.

(14) Never stray into fields in which you are not an expert. You may step into sub fields of your discipline unintentionally when giving evidence or a tactful counsel may drag you to an outside area beyond your expertise. It is a good practise to have a pre-evaluation about the limitations of your evidence on the previous day.

(15) Giving evidence in courts always requires extreme tolerance. You will invariably waste important time at courts due to procedural matters and it is a universal experience. Take few reading material with you which may or may not be related to the subject matter.

Giving medical expert evidence in courts is a skill as well as an art. A skill could be developed; an art should be derived by your own experience. Enjoy giving evidence in courts. Your evidence matters always.

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Role of Forensic expert in human right violations

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Human right violations (HRV) take place all over the world. Forensic experts have a humanitarian role as well as a legal role in this context. Nowadays the humanitarian role has become more important than the legal role as the victims and the relatives can develop immense emotional and psychological consequences such as post traumatic stress disorders (PTSD). To counteract such complications, family scientists, burial ceremonies for HRV victims etc. have been developed in forensic arena.

Earlier there had been less international standards for investigation in HRVs such as not using the best available practice (e.g. DNA testing) for the identification of victims or suspects. Now United Nations and International Red Cross have recommended the best practices for HRV investigations and new international laws also have been in force.

Sometimes forensic experts have to perform these investigations under immense difficulties such as political, financial and legislative problems. In some countries, official records (e.g. hospital records) are not being given accurately resulting in deficiencies in findings.

Most of the time, only the justice and rehabilitation of the victim is considered. Sometimes even victims are even victims are not being identified. In most of these cases, suspects are not being identified and the blame is put on a group rather than on a person. Therefore, less prosecutions and accountability are being made in such violations.

One of the future challenges of Forensic experts would be to protect human rights world over. But professionals have to maintain their standards according to their professional, legal and humanitarian framework.

APEX

ZINCOVIT

A rare presentation of a common condition: polymyositis like syndrome in hypothyroidism

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Case report

A 42 year-old previously healthy labourer presented with muscle pain, difficulty in getting up from the squatting position and inability to carry out his normal work for five months duration. He also had increasing sleepiness, loss of appetite and cold intolerance.

He had coarse features with loss of hair in the outer third of the eyebrows. Voice was hoarse and the skin was dry. Severe muscle tenderness was noted in both thighs with a positive Gower's sign. Shoulder girdle muscles were unaffected. He also had bradycardia and slow relaxing ankle jerks. He did not have a goiter.

His creatinine phosphokinase (CPK) was 5000 U/L. Electromyographic features were compatible with nonspecific myopathic changes. TSH was 50 miu/L while ESR was 20 mm for the first hour.

Echocardiography showed a trivial pericardial effusion. All the other routine investigations including FBC, serum creatinine, serum electrolytes were normal.

He showed a marked improvement with thyroxine 100 µg/day. His myalgia disappeared totally. CPK and TSH values were normalised after 8 weeks of therapy.

Discussion

Patients with hypothyroidism have frequent muscle complaints and proximal muscle weakness occurs in about one third of them [1]. Elevated CPK levels up to ten times of normal is often seen [1]. But our patient had a marked elevation of CPK with severe myalgia and muscle tenderness than what is usually seen with hypothyroidism.

There had been few similar case reports. A MEDLINE review of cases reported over the past twenty five years has shown a mean CPK of 2164 (SD = 1954) U/L and the mean TSH of 114.8 (SD = 85.6) miu/L. Only 50% of the patients have undergone electromyography; half of the studies have been normal while the other half had nonspecific features [2]. Our patient's findings were keeping with above values.

Hypothyroid patients presenting with predominant muscle tenderness can be misdiagnosed and mismanaged as suffering from polymyositis. This case report emphasises the importance of ruling out undergoing hypothyroidism in patients with proximal muscle tenderness or elevated CPK.

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Inflammatory pseudotumour of the testis

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Introduction

Inflammatory pseudotumour is a tumour like lesion characterized histologically by fascicles of plump spindle shaped cells in a background of chronic inflammatory cells, predominantly plasma cells. Inflammatory pseudotumour occurs in a wide variety of somatic tissue and visceral organs, including the lung, liver, thyroid and many other organs. Inflammatory pseudotumour of the testis is a reactive non-neoplastic lesion that may mimic a neoplasm. We describe here the clinical and histological findings of inflammatory pseudotumour in the testis in an adult.

Case Report

A 70 year-old man was referred to the surgical clinic for a lump in the right testis. It had been present for more than one month and has not responded to antibiotics. Physical examination revealed a firm lump in the right testis. Ultrasound scanning of the scrotum revealed a neoplasm measuring 3×2×2 cm at the lower pole of the right testis. Right orchidectomy was done and the specimen sent for histology.

The specimen consisted of testis with a part of the spermatic cord. Serial sectioning of the specimen revealed a white gray lesion measuring 3×2.5×2 cm partially encircling the testis extending from the lower pole to the upper pole.

Histological sections showed a lesion composed of fascicles of plump spindle shaped cells with a dense infiltrate of inflammatory cells comprising lymphocytes, plasma cells and histiocytes (Figure 1). No cellular pleomorphism or mitoses were noted. The adjacent testicular tissue and the spermatic cord were morphologically normal.

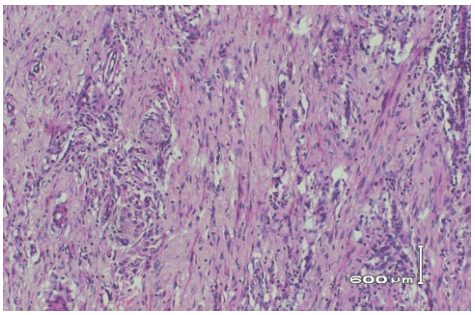

Figure 1 - Histological section of the testicular tumour

Discussion

Inflammatory pseudotumour of the testis is very rare and to our knowledge, was not reported previously in Sri Lanka. The cause of inflammatory pseudotumour remains unknown. Histological appearance of inflammatory pseudotumour of the testis is similar to that of inflammatory pseudotumour of other organs.

The proportion of spindle cells, foam cells, lymphocytes and plasma cells is highly variable. These spindle cells are fibro-histiocytic in nature. The cytological features of inflammatory pseudotumour have been described rarely. It is generally accepted that definite cytological diagnosis of inflammatory pseudotumour cannot be made by FNAC because the predominant cell proliferation is nonspecific.

Treatment is complete surgical resection which is curative.

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Laparoscopic case series

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Introduction

Cholecystectomy, appendicectomy and diagnostic procedures are commonly performed laparoscopically. However, the list of procedures being performed by laparoscopy is expanding. Laparoscopic approach has minimal morbidity related to the exposure (wound) such as pain, bleeding and incisional hernia [1,2]. A collection of case histories and discussions where laparoscopy was used as the surgical technique are presented below.

Case 1 - Recurrent direct inguinal hernia

A 64 year-old man presented with a right direct inguinal hernia which had been operated on twice before. On the last occasion a polypropylene mesh was used for the repair. He underwent a laparoscopic total extra-peritoneal repair with a satisfactory outcome.

In this case the dissection was done through undisturbed tissue planes. This avoids the difficult dissection of open hernia repair through distorted and fibrosed anatomical planes [3].

Case 2 - Laparoscopic splenectomy

A 25 year-old girl with immune-thrombocytopaenic purpura underwent laparoscopic splenectomy. Since in ITP the spleen is smaller than normal, it was retrieved into an endobag and pulled out through a small (transverse) incision. The operating time was 3 hours, which is longer than in an open surgery.

Case 3 - Laparoscopic fundoplication

A 54 year-old man with gastro-oesophageal reflux disease persisted to have volume reflux despite treatment with proton pump inhibitors and prokinetic drugs. He was carefully evaluated and a laparoscopic Nissen fundoplication was performed. His reflux settled but complained of dysphagia, a known complication of the procedure [3]. After one month from surgery his dysphagia settled. However, an upper gastro-intestinal endoscopy was done which demonstrated gastro-oesophageal junction at 40cm and surgically created valve like appearance on J manoeuvre.

Case 4 - Laparoscopy assisted right hemicolectomy

A 42 year-old man with a carcinoma caecum underwent laparoscopic mobilization of the caecum, ascending colon and proximal transverse colon. Exteriorization of the bowel was done through a small incision and an extracorporeal anastomosis performed. The operating time was 3 hours and blood loss was about 100ml.

Case 5 - Laparoscopic assisted abdominoperineal resection

A 73 year-old man with a rectal carcinoma underwent the above procedure. Laparoscopic mobilization of the recto-sigmoid was followed by (open) perineal resection. The sigmoid colon was transected through a small incision in the left iliac fossa which was later used to create the sigmoid colostomy. The resected bowel was delivered through the perineal incision. Operating time was 5 hrs. He had an uneventful recovery.

Case 6 - Thoraco-Laparoscopic oesophagectomy

A 44 year-old lady with a moderately differentiated squamous cell carcinoma of the oesophagus underwent the above procedure. The thoracic oesophagus was mobilized by thoracoscopy using 3 ports.

The stomach was mobilized by laparoscopy preserving right gastric and right gastro-epiploic

arteries. The cervical oesophagus was mobilized through a neck incision. The mobilized stomach and thoracic oesophagus were pulled into the neck. The stomach was divided 3 cm distal to the tumour. The cervical oesophagus was divided and gastro-oesophageal anastomosis performed in the neck. A feeding jejunostomy was placed assisted by laparoscope. The operating time was 5 hours and blood loss was 250 ml. There were no major incisions in the abdomen and chest. An intercostal tube was placed which drained 50ml during the first 24 hours. Operative time was 6 hrs and patient had an uneventful recovery.

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Bowel endometriosis: case report

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Introduction

Endometriosis is defined as the presence of endometrial glands and/or stroma in extra uterine sites. It is principally a disease of women in active reproductive life. This disorder often causes infertility, dysmenorrhoea, pelvic pain, and symptoms related to the affected organs. It occurs in the following sites in descending order of frequency: ovaries, uterine ligaments, rectovaginal septum, pelvic peritoneum, laparotomy scars and rarely in umbilicus, vagina, bladder and bowel. Three potential explanations of the origin of endometriosis are; the regurgitation-implantation theory, the metaplastic theory and the vascular or lymphatic dissemination theory. In addition hormonal and immune genetic factors may play a role for the susceptibility to develop endometriosis [1].

Case Report

A 37 year-old female was referred to the surgical casualty ward with a vague pain in the right side of the abdomen. The clinical diagnosis was an acute appendicitis. Conventional appendectomy was attempted but a mass lesion involving the wall of the ileo-caecal junction was found. Therefore, an exploratory laparatomy was carried out.

Part of the ascending colon, caecum along with the appendix and a part of ileum was removed and end to end anastamosis was made.

Pathological specimen consisted of a segment of the ascending colon, caecum along with the appendix and a segment of ileum. A white, constricting lesion was seen involving the wall of the bowel at the ileocael junction which appeared to involve the serosa, too. The lesion measured 4×2×2 cm. Appendix looked macroscopically normal. Eleven enlarged mesenteric lymph nodes were recovered.

Histological sections from the constricting lesion in the ileo-cecal junction showed several foci of endometrial glandular structures accompanied by endometrial stroma embedded in muscularis propria (Figure 1). They were lined by a single layer of columnar epithelium with basally located nuclei. No atypical features were noted.

Occasional mitoses were seen in the stroma. Intestinal mucosa of the ileum and caecum showed a moderate chronic inflammatory cell infiltration. Ascending colon and appendix were microscopically normal. All the eleven lymph nodes showed features of reactive hyperplasia.

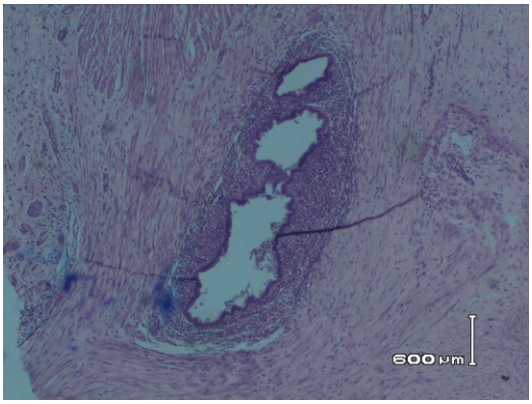

Figure 1 - Histological section of the lesion in the ileo - caecal junction

Discussion

Bowel endometriosis is very rare. It is usually an incidental finding in the gut, but some examples present themselves as an obstructing tumefactive mass that closely simulates an intestinal neoplasm [2]. Although some women with bowel endometriosis may be asymptomatic, the majority of them develop a variety of gastrointestinal complaints. Except for rectal nodules bowel endometriosis cannot be diagnosed by physical examination. Therefore, imaging techniques such as double contrast barium enema, transvaginal ultrasonography; rectal endoscopic ultrasonography, magnetic resonance imaging (MRI) and multi slice computed tomography enterolysis should be used [3].

Medical management of bowel endometriosis is currently speculative. Several studies demonstrated an improvement in quality of life after surgical excision of the lesion.

Bowel endometriotic nodules can be removed by various techniques; mucosal skinning, nodulectomy, full thickness disc-resection and segmental resection of the bowel [2].

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Low rectal carcinoma with liver metastasis

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Introduction

35-45% of patients with colorectal carcinoma develop hepatic metastases and if left untreated, survival beyond five years is extremely rare. In appropriately selected patients liver resection is associated with a 30-40% 5-year survival and a 20 % longterm disease free survival.

Case history

A sixty year-old female, presented with bleeding per rectum and alteration of bowel habits of nine

month duration. There were no systemic features of malignancy or metastatic disease. She had no family history of colorectal carcinomas.

On abdominal examination there were no masses, hepatosplenomegaly or ascites. Digital rectal examination revealed a circumferential rectal tumour involving anterior half of the rectum 4 cm from the anal verge.

Rectal biopsy revealed a well differentiated adenocarcinoma. A 3.7×5 cm size secondary deposit was seen in the right lobe of the liver on ultrasonography. Computerised tomography revealed the lesion to involve segments 5 and 8 of the liver. There was no para-aortic lymphadenopathy.

She was treated with neoadjuvant chemo-irradiation. The patient subsequently underwent abdominoperineal resection of rectum and resection of the hepatic metastasis. Right hepatic artery was ligated and divided and right branch of the portal vein was clamped before the procedure. Cholecystectomy and isolated segementectomy of the liver was performed. Ultrasonic dissector and surgical clips were used to achieve haemostasis. Right hepatic vein and IVC were not encircled or clamped during procedure. Patient had an uneventful recovery and was discharged from hospital on the 10th post operative day.

Discussion

Liver is the commonest site of secondary spread of colorectal cancer. Synchronous hepatic metastases are more aggressive than metachronous lesions. Patients with solitary metastases survive longer than multiple lesions. Patients with unilateral disease live longer than those with bilateral disease.

Diagnosis and staging of the liver metastases is a combination of history, examination and investigations including baseline tests, liver function tests, CEA and imaging techniques including ultrasound scan, CT, and MRI of abdomen. Extrahepatic disease is assessed by chest X-ray and CT thorax.

Liver resection is a safe surgery through understanding of anatomy and physiology combined with modern surgical techniques using ultrasonic dissector and practice of maintaining low venous pressure during the operation.

Hepatic resection is indicated in patients with solitary metastases and in those with metastases confined to localised areas of the liver and if the disease can be macroscopically eradicated with a 5mm margin leaving 3 normal segments. Because of the risk of peritoneal seeding, liver biopsy is best avoided in patients with resectable lesions.

If the liver is normal, up to 70% of the liver can be resected but one must decide on between resecting the entire tumour with an adequate margin, and leaving enough liver for the patient to survive.

The two important prognostic factors following liver resection are; (i) the resection margin (should be at least 5mm) and (ii) the stage of the original primary tumour. Liver transplantation is not recommended for patients with liver metastases, since immunosuppression can cause progression of the disease.

Chemotherapy is recommended for unresectable tumours and radiofrequency ablation improves survival over chemotherapy alone in patients with unresectable hepatic metastases.

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TIENAM

Neuropathic bladder and its sequelae: a management challenge to the Paediatrician

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Introduction

Neuropathic bladder commonly occurs secondary to congenital anomalies of the lower spine [1]. It can lead to recurrent urinary tract infections (UTI), vesicoureteric reflux (VUR) and hydronephrosis resulting in end stage renal failure. Prompt recognition and management improve the prognosis [1].

Case Report

A 7 month-old baby girl with a history of a repaired lumbosacral meningomyelocele at the age of four weeks, presented with fever, refusal of feeds, poor cry and reduced urine output for three days. She had been given a short course of antibiotics by a general practitioner but her symptoms persisted.

She had a culture positive UTI with ultrasound evidence of bilateral hydronephrosis at the age of six weeks. She had been on antibiotic prophylaxis up to now. Ultrasound scan of the brain had been normal.

On examination, she was febrile, drowsy but her anterior fontanelle was normal. Her blood pressure was 70/50 mmHg. The bladder was palpable and anus was patulous. She had effective limb movements against resistance.

Her blood and urine cultures were sterile. She was treated empirically with intravenous ceftriaxone for possible meningitis. Lumbar puncture done later was normal. Few days later she developed pyuria and the repeat urine culture became positive for E. coli and antibiotics were changed to intravenous Amikacin according to the sensitivity pattern. Ultrasound scan of the abdomen confirmed acute renal parenchymal disease and a diagnosis of acute pyelonephritis was made. The bladder was dilated and there was persistent bilateral hydronephrosis. A palpable bladder in this child with meningomyelocele was suggestive of neuropathic bladder which predisposed to this acute illness. She was referred to the paediatric surgeon and was commenced on clean intermittent catheterization to empty the bladder.

Her response to treatment was poor and she was clinically deteriorating. She had acidotic breathing. Her urine output was low and pyuria continued. She was transferred to Lady Ridgeway Hospital, Colombo for further management where she was treated for Gram negative septicaemia due to acute pyelonephritis and her condition improved. Further investigations did not show any evidence of chronic renal failure and she was transferred back to Teaching Hospital, Karapitiya.

We have planned for further evaluation of her renal tract with MCUG to assess reflux and DMSA for renal scarring. She is currently on nocturnal antibiotic prophylaxis to prevent further urinary tract infections and intermittent bladder catheterization.

Discussion

Neuropathic bladder may be detected antenatally with ultrasound examination or postnatally during neonatal examination. Later in childhood it may present as a voiding problem.

The associated defective or uncoordinated neuronal supply to the bladder may present as three major types of bladder dysfunction [1].

1. Synergistic dysfunction – due to an increased contraction of detrusor muscle.
2. Dysynergistic bladder – due to detrusor muscle and urethral sphincter incoordination.
3. Atonic dysfunction – due to lack of detrusor or sphincter activity.

They are at a risk of developing recurrent UTI, VUR and hydronephrosis. Renal damage or failure can occur as a result of repeated infections with progressive renal scarring or as a result of obstruction caused by inability to empty the bladder. During follow up visits, each patient should have a physical examination with blood pressure measurement and growth monitoring, a urine analysis for proteinuria for early detection of deteriorating renal functions, a urine culture and ultrasound examination of the upper urinary tract. The best way to assess the bladder function is urodynamic studies which are not available in Sri Lanka.

Clean intermittent catheterization is the main stay of therapy and it should be done 3-4 times per day along with antibiotic prophylaxis to prevent UTI [1]. The other treatment options include pharmacological and surgical interventions. Pharmacotherapy includes anticholinergics for dysynergistic bladder. In the surgical approach lower urinary tract is manipulated by diversion, augmentation, bladder neck surgery or using artificial sphincter [1]. Ureteral reimplantation can be performed in patients with recurrent symptomatic UTIs despite adequate bladder drainage and antibiotic prophylaxis or in patients with persistent high-grade reflux with demonstrated renal scarring.

It is important to counsel regarding future social and psychological consequences of neuropathic bladder. The paediatricians can act as advocates to ensure adequate and smooth transition to adult services later [2].

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A patient with generalised warty lesions

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Case report

A 36 year-old male, presented with intermittent low-grade fever, night sweats, productive cough with haemoptysis and diarrhoea of two month duration. Additionally, he complained of anorexia and weight loss for the past six months. He also suffered from generalised warty skin lesions for the past five years and recurrent respiratory tract infections for the past two years. He has a past history of recurrent cellulites from the age of twenty.

On examination, he was febrile, emaciated and depressed. There were warts covering all parts of the body and oral mucosa which showed evidence of Candida infection. He did not have jaundice, lymphadenopathy, clubbing, peripheral stigmata of endocarditis or features suggestive of chronic liver disease. Abdominal examination revealed an enlarged liver (liver span of 16 cm) and spleen. In addition, he had coarse crepitations in apical region of the right lung.

After the initial clinical evaluation, the following possibilities were considered; disseminated tuberculosis or lymphoreticular malignancy in the setting of immune deficiency state.

His full blood count showed low white cells (<1000/mm^3), anaemia (Hb 8.2 g/dL) and

thrombocytopenia (90×10^9/L). ESR was 120 mm in 1st hour while blood picture showed normochromic normocytic red blood cells with marked leucopenia and low platelet count. Excessive rouleaux formation was noted. His chest X-ray showed right apical non-confluent shadow suggestive of consolidation. Examination of sputum for Acid Fast Bacilli was negative on three consecutive days and Mantoux test was also negative.

Ultrasound scan of the abdomen confirmed mildly enlarged spleen and there were multiple circumscribed hypoechoic lesions within the spleen. Some lesions showed central hyperechogenicity. There was moderate hepatomegaly. No ascites or enlargement of para-aortic lymph nodes were seen.

His liver and renal functions were normal while liver biopsy showed normal liver tissue. Bone marrow examination was normal and bone marrow culture was negative for bacteria or Acid Fast Bacilli. His blood, urine and stool cultures were sterile. HIV screening also was negative.

Since the above investigations did not point to a definitive diagnosis and there were features of immunodeficiency the following immunological studies were done.

Serum immunoglobulin concentrations

IgG	190 mg/dL	(200 – 1300)
IgM	70 mg/dL	(60 – 280)
IgA	100 mg/dL	(90 – 450)

Lymphocyte subsets

CD4	- 95 /L	(300 – 1400)
CD8	- 86 /L	(200 – 900)
CD3	- 194 /L	(700 -2100)
CD20	- 2 /L	(100 – 500)

The above findings were suggestive of common variable immunodeficiency and patient was treated with a combination of anti- tuberculosis therapy, broad-spectrum antibiotics and antifungal agents. While on treatment patient failed to show an improvement and subsequently died. Postmortem findings including histology confirmed disseminated Aspergillosis involving the liver, spleen, kidneys and lungs.

Discussion

Common variable immunodeficiency is a heterogeneous disorder characterised by the following [1, 2]:

- markedly reduced serum levels of IgG (<400 mg/dL) and variably low IgA or IgM.
- recurrent bacterial infections.
- impaired antibody response despite the presence of B cells.
- normal or near-normal T-cell immunity in 60% of patients [1-3].

We arrived at the diagnosis based on reduced IgG, IgA and IgM with the

(a) onset of immunodeficiency state after 2 years of age and

(b) exclusion of defined causes of hypogammaglobulinaemia.

Fulfilling the third criteria which include the "absent or poor response to vaccines" was not practical in this patient.

Treatment includes intravenous immunoglobulin for life and antibiotics for the possible infections. Interleukin-2 (IL-2), Tumour necrosis factor (TNF) inhibitor and B lymphocyte stimulator (BlyS) therapy are been used as experimental therapies [2, 4].

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Elderly man with confusion: the unexpected

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A 69 year-old diagnosed patient with hypertension and ischaemic heart disease was admitted to hospital with a four day history of dysurea, vomiting, reduced urine output and altered behaviour for one day.

He was well until one month prior to the hospital admission when he developed an upper respiratory tract infection which lasted for three days and on the fourth day of the illness he became confused together with an unsteady gait. He was admitted to a district general hospital where he was infused with intravenous fluids to which there was a dramatic response. He was also found to be anaemic and the blood picture was normochromic, normocytic but a cause for the anaemia was not established. He was transfused with a pint of blood and discharged.

He was well for three weeks until he was admitted to the Teaching Hospital, Karapitiya with symptoms suggestive of a urinary tract infection. On examination he was afebrile, confused, pale and hypotensive. Reduced body hair was also noted. There were no focal neurological signs.

On admission the following differential diagnoses were considered; urinary tract infection, electrolyte imbalance secondary to vomiting and chronic subdural haemorrhage.

Treatment was commenced empirically with intravenous Co-amoxyclav. Investigations revealed the following: UFR - normal, Urine culture - sterile, Na^+ - 125 mmol/L, K^+ - 6 mmol/L, RBS - 3.3 mmol/L, Hb - 11 g/dL and Chest X-Ray - normal. Patient remained confused despite treatment. There was persistent hyperkalaemia with hyponatraemia and the blood pressure remained low which prompted us to investigate for a possible hypoadrenalism. He was started on intravenous dexamethasone and normal saline for which he showed a marked improvement. Subsequent investigations revealed a low ACTH concentration (< 10 pg/mL - mean 24 pg/mL) with a low 6.00 a.m. cortisol concentration (35.8 nmol/L - Normal range - 100 -600 nmol/L) confirming our tentative diagnosis of secondary adrenal insufficiency. CT scan of the brain revealed an intrasellar pituitary tumour. On further evaluation of the pituitary hormone profile a low concentration of LH (0.79 u/L - Normal range1-10 u/L) and a low normal concentration of GH (4.35 u/L - Normal range > 4u/L) was found. Rest of the anterior pituitary hormone concentrations remained within normal range. Since the tumour showed mass effect he was referred for neurosurgical management.

Discussion

Pituitary tumours are uncommon (1-2 /100,000 patients per year) [1]. They account for 10% - 15% of intracranial tumours and 75% of them secrete inappropriate levels of pituitary hormones [2]. Almost all the pituitary tumours are benign [1]. Typical presenting features include hormonal hypersecretion, visual field defects, headache, hypopituitarism, pituitary apoplexy, hydrochephalus, cranial nerve palsies and temporal lobe epilepsy.

This patient presented with anaemia and recurrent episodes of confusion which could have occurred due to adrenal insufficiency precipitated by trivial infection possibly a respiratory tract infection or urinary tract infection.

This case demonstrates the need to be vigilant about the possibility of rare conditions presenting as common clinical presentations like anaemia and confusion in the elderly.

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Lippes loop in the retroperitoneal space

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Case Report

A 63 year-old mother of six children was found to be having a left renal stone on ultrasonography. The IVU showed a 2 cm stone in the left renal pelvis. In addition it revealed a Lippes loop in the region of the left sacroiliac joint, closely related to the left ureter (Figure 1). Twenty one years ago she has had a Lippes loop inserted (after her third child) which was never removed. Since then she had borne three more children but the IUD (Intrauterine device) was never looked for.

Left pyelolithotomy was performed via the transcostal approach and exploration of the retroperitoneal space revealed the Lippes loop located retroperitoneally closely related to the ureter. It was removed with ease (Figure 2).

Discussion

Transmigration if the IUDs from the uterine to the pelvic cavity is well known. Most of the migrated IUDs are located within the abdominal cavity and found in the conglomerated mesh bordered by intestines and omentum [1]. Some migrate into the bladder and appendix causing stones and appendicitis, respectively [2, 3]. Rarely IUDs have been found to be embedded in the parametrial tissue of the broad ligament [4]. However, extraperitoneal migration of Lippes loop into retroperitoneal tissue is very rare.

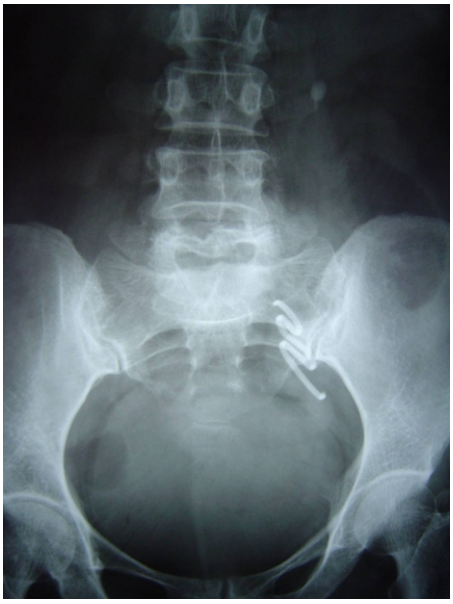

Figure 1 - IVU showing the Lippes loop

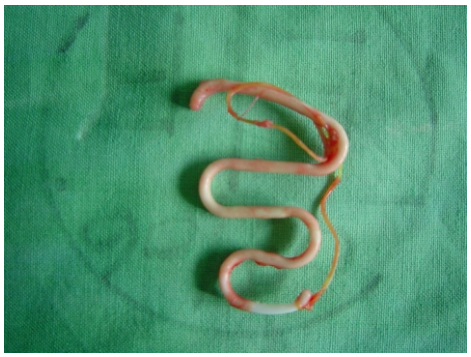

Figure 2 - Lippes loop after removal

Pregnancy should raise suspicion of improper placement, transmigration or expulsion of the IUD [5]. If the lost IUD is not found in the placenta and membranes at the time of delivery, imaging of the abdomen and pelvis must be done to locate it. When intraperitoneal, laparoscopic removal of the IUD is considered the first choice of therapy [1]. However, open surgery may be necessary in some [6].

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A young lady with MELAS syndrome: a sporadic case

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Introduction

Mitochondrial myopathy Encephalomyopathy Lactic Acidosis and Stroke-like syndrome (MELAS) is a rare neurodegenerative disease, characterized by recurrent stroke-like episodes, lactic acidosis, bilateral occipitoparietal infarction and basal ganglion calcification. Only a few cases have been documented worldwide.

Case report

A 30 year-old lady presented with acute severe headache, tinnitus, blurred vision and weakness followed by two episodes of generalized tonic clonic fits. Symptoms worsened over a period of 48 hours. Her first presentation with a similar illness was two years ago and since then she has hearing impairment.

On examination, she was unconscious with grade III weakness in all four limbs, exaggerated deep tendon reflexes and right extensor plantar response.

Her random blood sugar, full blood count, arterial blood gas analysis and cerebrospinal fluid analysis were normal. Urine full report showed proteinuria (++) and no cells. Blood culture and urine culture were negative. ESR was 110 mm for the first hour but ANA and thrombophilic screening including lupus anticoagulant, anticardiolipin, antibodies IgG and IgM were negative.

CT scan of the brain showed bilateral basal ganglion calcification (Figure 1) and diffuse cerebral infarction involving occipito-parietal regions (Figure 2). The ECG showed Wolff-Parkinson-White Syndrome (WPW) type B but chest X-Ray and echocardiography were normal. Tests for HIV were negative.

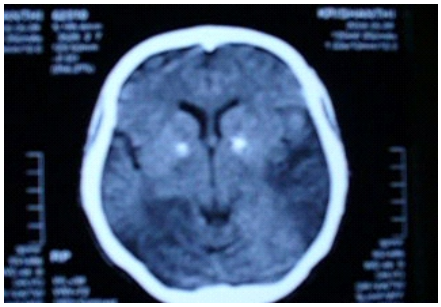

Figure 1 - CT scan of the brain showing calcification of basal ganglia

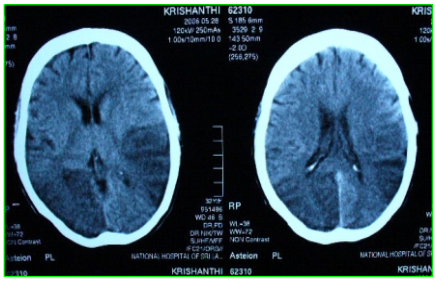

Figure 2 - CT scan of the brain showing diffuse cerebral infarction involving occipito-parietal regions

A tentative diagnosis of meningoencephalitis was made and she was commenced on Aciclovir and IV ceftriaxone but there was no improvement. Serum lactic acid concentration was 110.4 mg/dL (Normal 4.5–19.8). CPK was normal. Muscle biopsy showed dysmorphic muscle fibers under the light microscope. Audiometry showed neurosensory deafness. She achieved a delayed partial recovery over a period of three months, but was dementic and mute most of the time. She was discharged on niacin and vitamin B_1.

Discussion

MELAS is a rare progressive multisystem disease, presenting either sporadically or among members of affected maternal pedigree. In USA no estimates of MELAS mutation are available. However, it is 10.2 per 100,000 in adult Finnish population and 1 per 13000 in Northern England. It has high morbidity and mortality. No sex predilection exists. About 80% of patients have a heteroplasmic A to G point mutation in Dihydrouridine molecules and it is detected in mitochondrial DNA [1, 2]. Metabolic stroke-like episodes may be vascular or parenchymal due to a transient dysfunction of oxidative phosphorylation and consequently increased free radicals, vasoconstriction and decreased oxygen availability [3].

The myopathy manifests with weakness and easy fatigability. Encephalopathy may progress to dementia and apathy. The stroke-like episodes are the hallmark of the disease –associated initially with vomiting, headache and seizures and later with hemiplegia. The visual complaints are due to either ophthalmoplegia or blindness which may occur as a result of optic atrophy, lesions in the area of the brain concerned or retinal pigmentation. Diabetes mellitus is a common manifestation [4]. The dilated or hypertrophic cardiomyopathy and WPW may be present in some patients. Peripheral neuropathy, neurosensory deafness, gait ataxia, psychiatric disorder and neuroradiological features such as cerebral infarction, cerebral atrophy and calcification of basal ganglia have also been reported in some cases [3, 5].

The clinical diagnosis of MELAS is based on the presence of the following 3 major features;

1. Stroke-like episodes, typically before 40 years of age.
2. Encephalopathy with seizures or dementia.
3. Mitochondrial myopathy, evidenced by lactic acidosis or ragged red fibers and the presence of two of the following features;

- Normal early psychomotor development.
- Recurrent headaches.
- Recurrent vomiting [5].

The muscle biopsy under H&E stain shows the changes due to myopathy. Ragged red fibers are the hallmark of MELAS, but it needs a special stain - Brilliant Red. The electron microscopy shows increase in number and size of mitochondria [3, 5].

Management is conservative. The vitamin supplements like Co enzyme Q10, Vit K_3 and K_4, riboflavin and niacin have been suggested to support respiratory chain enzymes in mitochondria, but no therapy is of proven efficacy. The genetic screening and counselling should be done at least in the first degree relatives. [3, 5, 6]

This case highlights the need to be aware of uncommon conditions that can have a common clinical presentation.

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Type I polyglandular syndrome patient presenting with metabolic encephalopathy

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Introduction

When two or more endocrine glands and other non endocrine immune disorders are present, the polyglandular autoimmune (PGA) syndromes should be considered. There are two major types of polyglandular autoimmune syndromes [1].

Type I polyglandular failure is characterised primarily by adrenal insufficiency, mucocutaneous candidiasis, hypoparathyroidism, and an array of other endocrine and non-endocrine disorders which occur with variable frequency [2].

PGA type I requires two of the three primary components for diagnosis. At the onset only one organ may be involved, but the number increase with time so that patients eventually manifest two to five components of the syndrome [1, 2].

Type II polyglandular failure (Schmidt syndrome) shares the high prevalence of adrenal insufficiency, but differs from the type I syndrome in that common features include autoimmune thyroid disease and insulin dependent diabetes mellitus. The onset of type II PGA is usually later than in type I, occurring primarily in adults [2].

We describe an unusual case of polyglandular syndrome type I brought to the hospital with a state of unconsciousness due to metabolic encephalopathy.

Case Report

History and Examination

A man in his early thirties found unconscious and brought to the emergency treatment unit of Teaching Hospital, Karapitiya by the police. He developed a tonic clonic seizure lasting for 3 minutes which resolved spontaneously. Though he regained consciousness within next few hours, he remained drowsy and confused.

Next day he became irritable and aggressive attacking the caring nursing staff. He developed fits again and went into a semiconscious state. He had fluctuating level of consciousness for next few days, but no fits. He also had watery diarrhea lasted for two days which settled with no specific treatment. There was no significant illness in the past but family members admitted that he had been an alcohol addict.

At the time of admission he was drowsy. Glasgow coma scale was 10/15. Pupils were equal in size with sluggish response to light. He was dehydrated but not febrile or pale. He had bilateral cataract. He had no lymphadenopathy. He had normal secondary sexual characteristics. He had whitish plaques over the buccal mucosa and tongue but no skin lesions.

Chvostek's and Trousseau's signs were negative. He had generalised rigidity with neck stiffness but no cogwheel rigidity. Muscle power was grade 4/5 in both upper and lower limbs. Plantar responses were flexor bilaterally. Blood pressure was 100/60 mmHg, with no postural drop. Rest of the cardiovascular system and also the respiratory system examination and the abdominal examination were normal. Digital rectal examination revealed mild prostatomegaly.

Investigations

His haemoglobin concentration was 10.6 g/dL. There was polymorphoneuclear leucocytosis. His blood urea was 70 mg/dL. He had hypokaleamia (2.8 mmol/L). Urinary electrolytes revealed Na^+ of 75 mmol/L and K^+ of 15 mmol/L. Electrocardiography showed prolonged QT interval with abnormal U waves. Electroencephalography revealed generalised increased theta and delta activity with EMG artifact in the frontal montages, compatible with metabolic encephalopathy (Figure 1). Fasting blood sugar was 95 mg/dL.

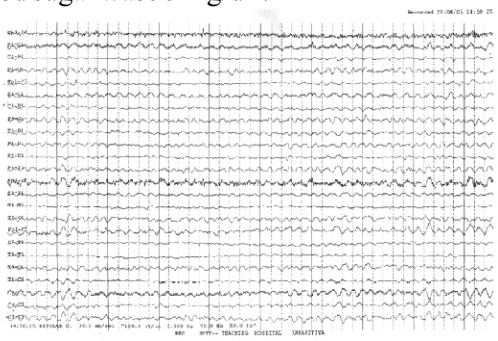

Figure 1 - Electroencephalography

CT scan of brain showed bilateral pathological basal ganglion and cerebellar calcification (Figure 2). He had low serum ionized calcium of 0.92 mmol/L (1.12 - 1.32 mmol/L) and with high serum inorganic phosphorus of 7.20 mg/dL (2.50-4.50 mg/dL). Parathyroid hormone level was <3.00 pg/mL (07-53 pg/mL with a median of 32 pg/mL).

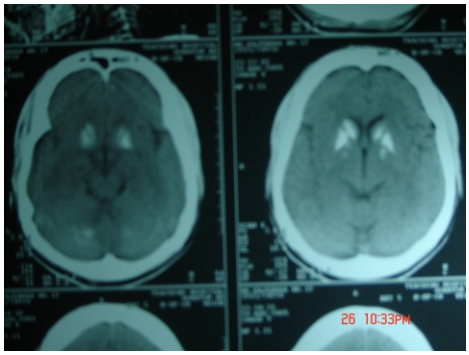

Figure 2 - CT Scan Brain (Non contrast)

Discussion

Hypocalcaemia with bilateral basal ganglion calcification, hyperphosphataemia and low serum parathyroid hormone (PTH) level confirms the diagnosis of hypoparathyroidism [3,4].

These features are shared by both types of hypoparathyroidism, acquired and hereditary [3]. He had no surgical scars to suggest that he had undergone previous thyroidectomy or any other surgery in the neck. Basal ganglia calcification and extra pyramidal syndromes are common and earlier in onset in hereditary hypoparathyroidism [3].

Although pseudohypoparathyroidism can cause similar CT appearance, it is unlikely in this case due to absence of other skeletal features and the low PTH levels. Hyperplasia of the parathyroids, a response to PTH resistance in pseudohypoparathyroidism, causes elevation of PTH level [3, 5].

Since idiopathic hypoparathyroidism can be part of autoimmune polyendocrine syndrome he was screened for other endocrine abnormalities to prevent illness associated with delayed diagnosis of additional autoimmune diseases [6].

Short Synacthen test was carried out by administration of 25 units (0.25 mg) of cosyntropin intravenously and measurement of plasma cortisol concentrations on 0, 30 and 60 minutes later. His serum cortisol concentration did not show any increase confirming the adrenal insufficiency. Thyroid profile, FSH and LH levels were normal.

Hypokalemia was a result of increased net loss of K^+ due to diarrhoea. Urinary K^+ was < 20 mmol/L indicating renal compensation to gastrointestinal loss. Elevated blood urea was due to dehydration and became normal with correction of volume. Ultrasound scan revealed no renal parenchymal disease.

He was treated with Phenytoin Sodium 100mg twice daily on admission to control fits. 1α-calciferol 0.25mg daily and calcium lactate 2 tablets twice daily was commenced when investigation results confirmed the hypocalcaemia. Within 72 hours of starting calcium supplementation he became conscious and rational. He was started on oral hydrocortisone 30 mg daily after short Synacthen test.

Primary hypoparathyroidism, adrenal insufficiency with mucocutaneous lesions suggestive of candidiasis favours the diagnosis of polyglandular syndrome type I [7]. Most patients initially present with oral candidiasis in childhood. It is poorly responsive to treatment and relapses frequently. Chronic hypoparathyroidism usually occurs before adrenal insufficiency. The endocrine components, including adrenal insufficiency and hypoparathyroidism, may not develop until the forth decade, making continued surveillance necessary [1, 7].

PGA type I is usually inherited as an autosomal recessive trait. The responsible gene, designated as either APECED (Autoimmune polyendocrinopathy – candidiasis-ectodermal dystrophy) or AIRE (Autoimmune regulator) encodes a transcription factor that is expressed in the thymus and lymph- nodes; a variety of different mutations have been reported [1, 4].

The clinical manifestation of adrenal insufficiency often develops slowly and may be difficult to detect. It can be fatal if not diagnosed and treated appropriately. Thus, prospective screening should be performed routinely in all patients and family members at risk for PGA type I and II.

He recovered fully and subsequently worked as a labourer in the janitorial service in the hospital. Later he reverted back to alcohol abuse and lost for follow up.

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Small cell carcinoma of the oesophagus: a rare and aggressive tumour

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Introduction

Small cell carcinoma is a neuroendocrine tumour commonly encountered in lungs which comprises 25% of all bronchogenic carcinomata [1]. But it is uncommon to occur in the oesophagus.

Case report

A 63 year-old male presented with dysphagia for solids for 1 month. He also had epigastric discomfort, distention, regurgitation and loss of appetite. He had no malena or haematemesis. He was free of comorbid factors. There were no abnormalities found on examination except that he was thinly built. Upper gastrointestinal endoscopy showed a mass lesion at the lower end of the esophagus. Histology of the lesion revealed a poorly differentiated small cell carcinoma (SCC). Ultrasound scan of the abdomen & computerised tomography of the chest showed no metastatic deposits. Lungs were free of tumour. Transhiatal esophagectomy was performed. The histology of the tumour was compatible with SCC of gastroesophageal junction. The stage was $T_2N_1M_0$. Two out of 8 lymph nodes were positive for tumour. Patient was referred to the oncologist for further management.

Discussion

Small cell carcinoma of the esophagus is a rare aggressive tumour with poor prognosis. It accounts for 0.05 - 4% of all esophageal malignancies [2]. In a study conducted in China (1989-2005), out of 4050 esophageal malignancies only 21 cases were SCC [2]. It occurs most frequently at lower esophagus but can also occur at upper or middle 3rd as well [3]. It is more common in males with male to female ratio of 3.2:1 [2]. Its clinical course is similar to that of SCC of the lungs [4] and other extra-pulmonary organs including the breast, ovary, uterine cervix, liver, salivary gland, stomach, colon, prostate, urinary bladder & kidney [2]. It has a very rapid growth with doubling time of 20 days [3]. Systemic and lymphatic metastasis occur very early [3].

Dysphagia is the commonest presenting complaint [2]. This patient had a mixture of symptoms in addition to dysphagia. That may be due to the fact that he had the lesion at gastroesophageal junction. The duration of symptoms ranges from 1-3 months [2].

Histological diagnosis is not difficult. Microscopic picture is similar to small cell lung cancer consisting of round to spindle shaped cells with scanty cytoplasm, granular nuclei and inconspicuous nucleoli. Immunohistochemical labelling with Synaptophysin, Chromogranin A, CD 56, Neuron Specific Enolase and Thyroid Transcriptional Factor-1 can confirm the diagnosis [2]. In this patient, microscopy showed sheets of small round cells with hyperchromatic nuclei & scanty cytoplasm. There were numerous mitoses, rosette formation and a trabecular arrangement. We could not confirm it by immunohistochemistry due to unavailability of resources.

Treatment of oesophageal small cell carcinoma in various studies showed a multimodality approach with surgical resection, chemotherapy and radiotherapy [2]. This patient is also being followed up by oncologists following surgery.

Previous studies in different hospitals showed a median survival of 7.5 months (range 1 - 21 months) [2]. But the recent Chinese study showed 18 months ranging from 3 - 71 months [2]. This patient is now in his 4th month after the diagnosis.

Conclusions

Small cell carcinoma is an aggressive tumour. It can occur in esophagus rarely. The diagnosis may not be difficult but need immunohistochemical methods to confirm. Treatment includes surgical resection with chemo and radiotherapy. However, it has a very poor prognosis.

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A man with a spare bladder - large acquired urethral diverticulum

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Case report

A 44 year-old unmarried male complained of "incontinence" of urine and a small boggy swelling at the base of the penis of 8 years duration. Manual pressure on the swelling resulted in passage of urine per urethra.

He had a road traffic accident (RTA) 12 years ago with pelvic fracture and bleeding per urethra. Pubic bone diastasis was wired and a urethral catheter was passed at the local hospital and kept for 3 months. He had lower urinary tract symptoms after discharge from hospital but it was managed conservatively as the initial (12 years ago) cystourethroscopy was normal.

On examination there was a cystic swelling of 1.5 cm x 1.5 cm on the ventral aspect of base of penis. About 30 ml of urine could be expressed on manual compression of the swelling.

Ultrasound scan of the abdomen was normal. Uroflowmetry showed an obstructing pattern. Routine urine analysis, microscopy, culture and biochemistry of the blood showed normal values. Urethrogram was reported as a fistulous tract extending from the distal bulbar urethra to superficial perineal pouch (Figure 1). But rigid cystoscopic examination visualised an opening in the penile urethra communicating with the boggy mass at the scrotum confirming the cystic mass a urethral diverticulum (Figure 2).

Diverticulectomy was done and the urethral defect was closed transversely and a Dartos patch was applied over it. He made an uneventful recovery.

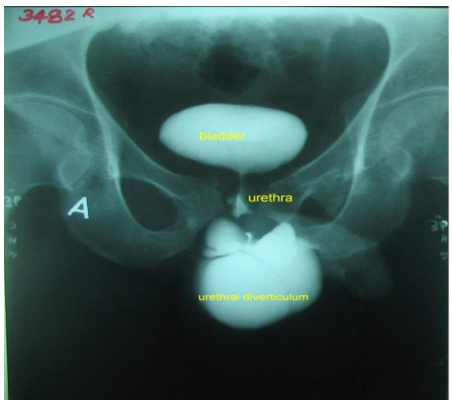

Figure 1 - Urethrogram showing a fistulous connection from the urethra to a superficial perineal pouch

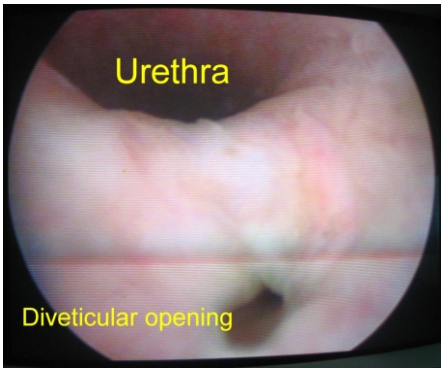

Figure 2 - Rigid cystoscopy showing the fistulous opening from the penile urethra.

Discussion

Male urethral diverticulae (UD) are rare and have been described mostly in relation to the anterior urethra. More than 90% are of the acquired variety and result from trauma, instrumentation, surgery, suppuration and urethral calculus or stricture [1].

The common symptoms are irritative lower urinary tract symptoms (LUTS) and recurrent urinary tract infections (UTI). Other complaints include pain, haematuria, obstructive LUTS or urinary retention and incontinence (stress or urge). As in this case, some patients may also have a mass, which upon gentle compression may reveal retained urine or pus discharge through the urethral opening [1, 2].

In this patient the urethral stricture which was a result of the previous injury had healed initially, as suggested by the initial cystoscopy and recurred after some time which was not addressed properly. This has resulted in formation of urethral diverticulae, which is a known complication of long standing urethral stricture disease.

Urethrogram usually reveals the diagnosis. Other advanced techniques for the evaluation of UD include double-balloon positive-pressure urethrography (PPU), voiding, cysto-urethrography (VCUG), ultrasound (US) and magnetic resonance imaging (MRI) with or without an endoluminal coil (eMRI) [3].

Surgical options include either transurethral incision of the diverticular neck or surgical excision. However, all UD do not warrant surgery. Small, asymptomatic once can be left alone. Surgical excision is the treatment of choice but it should be performed with caution. The diverticular sac may be quite attached to the adjacent urethral lumen and careless removal of the sac may result in a large urethral defect requiring construction of a new urethra. Other important considerations during surgery include identification and closure of the diverticular neck and complete removal of the mucosal lining of the diverticular sac to prevent recurrence and a multiple layered closure with Dartous patch to prevent post-operative fistula formation. Endoscopic division of the neck to create a wide communication between the urethra and the diverticulum has also been recommended [4]. If there is an associated urethral stricture, it has to be treated on its own merit. This patient didn't have any significant urethral stricture.

Some patients may have persistence or recurrence of their pre-operative symptoms post-operatively. The finding of a UD following a presumably successful urethral diverticulectomy may occur as a result of a new UD, or alternatively, as a result of recurrence. Recurrence of UD may be due to incomplete removal of the UD, inadequate closure of the urethra or residual dead space or other technical factors. Repeat urethral diverticulectomy surgery can be challenging, as anatomic planes may be difficult to identify [5].

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An unusual presentation of multiple haemangiomas of the liver

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A 21 hour-old, term neonate with birth weight of 2.35 kg was admitted to the special care baby unit (SCBU) of the Teaching Hospital, Karapitiya due to severe pallor. She is a product of non-consanguineous parents. Antenatal period was uneventful and the mother was not on any anticonvulsants or warfarin. Baby was delivered by vacuum extraction due to prolonged labour. There was no history of birth trauma or asphyxia. Vitamin K was given at birth. Around 2 hours of age she was found to be extremely pale and was transferred to SCBU. On admission, she was very pale but not icteric. She was active, afebrile and there were no signs of sepsis or congenital infections. There were no hemangiomas or capillary malformations over the skin. Rest of the examination was normal.

Her Hb concentration was 3.9g/dL, WBC count was 9×10^9/L (neutrophils - 70%, lymphocytes - 28%) and platelet count was 200×10^9/L. Blood picture showed normochromic, normocytic red cells with many polychromatic cells and normoblasts. Leucocytes and platelets appeared normal. Reticulocyte count was 6%. Maternal blood group was B^+ and the baby's blood group was O^+. Unexpected antibodies were not detected. Serum bilirubin was within the normal range. Clotting profile including prothrombin time was normal. SGOT (61 u/L) and SGPT (74 u/L) were at the upper limit of the normal range.

On the day of admission a blood transfusion and an additional dose of vitamin K 1mg IM was given. Post-transfusion Hb was 12.1g/dL. At forty-eight hours of age, the baby developed bleeding per rectum without any other bleeding manifestations.

Ultrasound scan of the abdomen showed a normal sized liver with multiple hyperechogenic foci within it. CT scan of the abdomen revealed multiple haemangiomas of the liver. There were no further episodes of bleeding. Child was sent home with a plan of close follow-up and to do a colonoscopy if the symptoms recur. Our clinical impression was multiple haemangiomas of the liver associated with haemangiomas of the gastrointestinal tract.

Discussion

Infantile haemangiomas are benign vascular neoplasms that have a characteristic clinical course marked by early proliferation and followed by spontaneous involution. Haemangiomas can occur in skin and extra-cutaneous sites including liver, gastrointestinal tract, larynx, central nervous system, pancreas, gallbladder, thymus and the spleen. Haemangioma are the commonest type of hepatic vascular tumours that present in infancy. It may occur as solitary lesions or as multiple

lesions in the liver. It is commonly associated with cutaneous lesions and rarely with hemangiomas in the gut wall [1].

The commonest complication of hepatic haemangioma is congestive cardiac failure which needs intensive medical therapy [2]. Pressure on the stomach and duodenum by large pedunculated lesions may present with abdominal pain, nausea and vomiting. Compression of inferior vena cava may result in "Budd-chiari syndrome".

The "Diffuse neonatal haemangiomatosis" is a rare disorder that usually present in infancy and has a high mortality rate. They have haemangiomas which are calcified in the liver, bowel wall, spleen, and adrenal gland [3].

The infantile haemangiomas are asymptomatic and treated conservatively with watchful expectancy. The goals of pharmacotherapy are to reduce morbidity and to prevent complications. Oral and intralesional corticosteroids are effective at slowing growth and decreasing the size of proliferating haemangiomas. Interferon - 2-a inhibits endothelial cell migration and specific growth factor. It can be used in lesions that are unresponsive to steroids. Laser surgery is beneficial in treating both proliferating and residual vessels of haemangiomas. When liver haemangiomas are complicated with cardiac failure, it can be treated with ligation of hepatic artery and prednisolone, digoxin, diuretics [4].

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Aneurysm of the left common iliac artery

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Introduction

Aneurysm is an abnormal dilatation of an artery. Abdominal aorta is the commonest site. Aneurysms presenting with symptoms (pain, distal embolization, rupture) need repair. Asymptomatic patients need careful evaluation (risk of rupture vs risk of repair) to decide on elective repair. Aneurysms are repaired surgically or by endovascular techniques [1,2].

Case history

A 75 year-old patient presented with lower and central abdominal pain of two weeks duration. He complained of persistent pain which had progressed in intensity. He had no alteration in bowel habits and had no urinary symptoms. He had a poor response to analgesics. An ultrasound scan revealed an aneurysm of the common iliac artery which had probably leaked but contained. An urgent CT scan confirmed the findings.

The patient was prepared for emergency repair of the aneurysm. At the surgery a leaked and contained aneurysm of the right common iliac artery was found. The neck of the aneurysm was extending up to aortic bifurcation. The abdominal aorta and both common femoral arteries were dissected. Vascular clamps were applied to occlude the infrarenal aorta, right common iliac artery distal to aneurysm and left common iliac artery. The aneurysm was opened and thrombus removed. Reconstruction was performed by aorto-bifemoral synthetic graft. Patient had an uneventful recovery

Discussion

Aneurysms of the iliac arteries are rare. They may present with abdominal and back pain, distal ischaemia or as an emergency due to rupture. Pain has to be carefully evaluated as it may be due to another pathology. Symptomatic aneurysms need repair.

Asymptomatic aortic aneurysms need elective repair if the diameter is larger than 5.5cm or rate of expansion is greater than 0.5cm in six months (due to high risk of rupture). However, in elective operations fitness of the patient and the life expectancy also need consideration [1, 2].

The patient under discussion had pain and a suspected aneurysmal leak on imaging. He had hypertension which was well controlled medically. He was otherwise well.

He was subjected to open repair, a major procedure involving aortic clamping which has a significant morbidity and mortality rate. These risks are minimal in endovascular repair in which a stent graft is deployed into the aneurysmal segment through the femoral artery. Endovascular repair does not involve general anaesthesia, laparotomy and aortic clamping.

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A rare case of multiple hereditary exostoses with spinal cord compression

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A nine year-old previously well child presented with weakness of both lower limbs of 9 months duration. He developed numbness and weakness of the right lower limb 9 months back. Then the child was admitted to General Hospital, Matara and was investigated. The child went home prematurely before the completion of investigations and defaulted follow-up due to multiple social problems. Six weeks later he developed weakness of the left lower limb as well. Weakness of limbs progressed slowly over the next few months and he became bed-bound with paraplegia. He had urinary and faecal incontinence. As a result of his illness he was unable to attend the school and stopped schooling completely. There was a family history of multiple hereditary exostoses (HME) in the father, younger sister, and a paternal aunt. The family was affected by Tsunami in 2004 and shifted residence. The father was jailed for

suspected murder. The mother was unable to cope with the illness of the child, the father's imprisonment and the post tsunami problems like housing and feeding the other children. Therefore, she did not seek medical care for the child.

The child was having grade 0 power in both lower limbs with exaggerated reflexes, clonus and bilateral extensor plantar responses. There was a mild weakness of the left hand grip. The sensory level was at T_6 level. Rest of the neurological examination was normal.

General examination revealed multiple exostoses of the body, mainly on femur, tibia and humerus. MRI scan of the cervical and thoracic spine was done. A bony growth compressing the spinal cord at T3 level almost bisecting the cord was found (Figure 1). Neurosurgery was performed with a laminectomy and excision of the bony growth resulting in decompression of the cord. Within 1 week of the surgery the child was able to stand with support despite bilateral tendo-Achilles contractures. Even some bladder and bowel sensation has returned. He was trained in clean intermittent catheterization and a rehabilitation programme was arranged with physiotherapy and a wheelchair. Due to the poor social support setup, a nongovernmental organization (NGO) took over the responsibility of providing a wheelchair and physiotherapy.

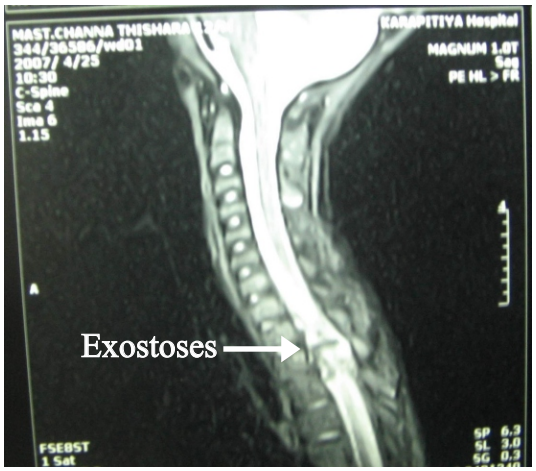

Figure 1 - MRI scan of the cervical and thoracic spine

Discussion

HME is an autosomal dominant disorder in which multiple osteochondromas arise from the surface of bones. It is the commonest bone tumor and it can affect any bone preformed in cartilage. Generally it occurs in the periphery of the most rapidly growing ends of long bones [1]. Patients with HME may have 2-100 osteochondromas. Most are solitary osteochondromas discovered incidentally in children and adolescents. Exostoses usually appear in the childhood between 2-10 years of age. Exostoses usually grow until the growth plates are open and their growth ceases with the skeletal maturity. Rarely spontaneous resolution occurs during the childhood [2].

HME is associated with complications like short stature, limb length inequality, limb deformities and scoliosis. They may undergo malignant transformation (1-20%). Tendons, nerves, blood vessels may get trapped around the osteochondromas leading to symptoms. Visceral injuries and luminal obstruction may occur with inwardly growing osteochondromas.

Spinal cord compression is an extremely rare complication of HME. Few cases had been reported and they have presented in the second decade of life and mainly in the thoracic region. MRI or CT is the investigation of choice for an early diagnosis. Early surgical decompression with laminectomy results in excellent functional neurological recovery [3, 4]. But with the delay in presentation and surgery, residual neurological impairment can occur [5].

Other aspects to highlight in this case are lack of a good social service in our country which can attend to problems of children like this resulting in compromised health status. This lack generally affects the poorer segments of the society. We depend on well-wishers and NGOs for their goodwill to provide proper care for such children instead of an organized social security system from the government.

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