International Urology and Nephrology 28 (4), pp. 601–604 (1996)

Serum Tumour Markers in Renal Failure

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(Accepted March 30, 1996)

In order to assess the clinical value of six tumour markers in pre-dialysis patients with chronic renal failure as well as in patients on regular haemodialysis, we studied these markers in 35 predialysis patients, 35 patients on chronic haemodialysis and 35 healthy controls. Serum squamous cell antigen (SCC), CA 19.9, and CA 125 levels were found to be elevated in the uraemic groups as compared to the normal controls. Carcinoembryonic antigen (CEA), alpha foetoprotein (AFP), and prostate-specific antigen (PSA) levels were within normal limits in all groups.

Introduction

There are many conflicting reports as to whether the incidence of malignancy in uraemic patients is increased or not. Some studies have stated an increased incidence while others have reported a risk not different from that found in non-uraemic populations [1–7]. Besides, a well-designed controlled study reported by Port et al. suggested that dialysis patients were at increased risk for at least three different types of tumours, namely prostate cancer, tumours of the kidney and corpus uteri [8].

Despite the fact that tumour markers have some limitations, several workable markers are already available and they have been widely used in clinical oncology. These markers are potentially useful for: (a) screening a population, (b) early detection of patients with suspected disease, (c) assessing tumour burden and prognosis, (d) assessing response to therapy, and (e) evaluating early recurrence [9].

The precise value of tumour markers in chronic renal failure has not been determined clearly, and various reports stated different conclusions with regard to the role of most available markers in monitoring malignancies in uraemic patients [5, 10, 11, 12].

In order to clarify the clinical value of tumour markers in a uraemic population, we examined 6 tumour markers in pre-dialysis patients with chronic renal failure as well as in patients on regular haemodialysis and compared the results to those obtained from normal controls in the present study.

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Patients and methods

One hundred and five individuals without any clinical evidence of neoplasia were studied. The participants were divided into three groups as follows: group A consisted of 35 uraemic patients receiving long-term haemodialysis (18 males, 17 females, aged 33±2 years). The duration of HD ranged between 12 and 156 months. Group B comprised 35 pre-dialysis patients (19 males, 16 females, aged 50±2 years), and group C included 35 healthy controls (18 males, 17 females, aged 43±2 years).

The following tumour markers were measured: alpha-foetoprotein (AFP), carcinoembryonic antigen (CEA), CA 19.9, CA 125, prostate-specific antigen (PSA), and squamous cell carcinoma antigen (SCC). All tumour markers were measured in the serum by microparticle enzyme immunoassay (Abbott Lab.).

In haemodialysis patients blood samples were taken before the first weekly dialysis session. Data are expressed as mean±SEM.

The results were analyzed by means of Student's *t*-test for CEA, AFP, SCC, CA 19.9, CA 125 and the Mann–Whitney U test for PSA. Values of $p<0.05$ were considered as statistically significant.

Results

Table 1 shows the mean levels of six tumour markers in three groups as well as the p values for comparison of these groups. As indicated in Table 1:

1. None of the mean levels of the 6 tumour markers was changed significantly between group A and group B.
2. The mean levels of SCC, CA 19.9, and CA 125 were found to be significantly higher in group A and in group B than in the control group.
3. The other three markers, i.e., AFP, CEA, PSA did not show any significant changes in either group.

Table 1

Mean serum levels of CEA (ng/ml), AFP (ng/ml), PSA (ng/ml), SCC (ng/ml), CA 19.9 (U/ml), and CA 125 (U/ml) in three groups

	Group A	Group B	Group C	A vs. B	A vs. C	B vs. C
CEA	2.6± 0.3	2.3± 0.2	1.9±0.2	p>0.05	p>0.05	p>0.05
AFP	3.3± 0.6	3.9± 0.5	3.1±0.3	p>0.05	p>0.05	p>0.05
PSA	0.7± 0.1	3.8± 2.4	1.3±0.3	p>0.05	p>0.05	p>0.05
SCC	5.2± 0.6	6.0± 1.5	1.5±0.2	p>0.05	p<0.05	p<0.05
CA 19.9	78.4±16.7	46.0± 7.3	25.4±2.3	p>0.05	p<0.05	p<0.05
CA 125	15.0± 1.9	47.3±17.5	9.2±1.2	p>0.05	p<0.05	p<0.05

Discussion

The results of our study show that CA 19.9, CA 125, and SCC were elevated in group A and group B when compared to controls. In contrast to that, AFP, CEA, and PSA levels did not show any significant alterations between the three groups. Connecting the mean levels of the measured tumour markers, our findings did not indicate any significant difference between group A and group B. In other words, addition of haemodialysis therapy does not seem to alter the profile of serum tumour markers in chronic renal failure on conservative management.

In the present study, the mean levels of CEA in uraemic patients were not different from that in healthy controls. Previously Odagiri et al. also reported normal CEA levels in dialysis patients [10]. On the other hand, a rise of CEA levels in patients on regular haemodialysis has been reported by various investigators [11–16].

The concentrations of AFP were within normal limits in both group A and group B in the present study. Similar findings were reported by De Santo et al. and Cases et al. [13, 14]. But Zeferos et al. reported increased AFP levels in haemodialysis patients [11].

Concerning CA 19.9 and CA 125, the mean serum concentrations of these markers were significantly higher in both groups with renal failure in this study. In the literature opposite results had been published. The findings of Docci et al. are in accordance with the ones in our study [17]. But various investigators concluded that CA 19.9 and CA 125 were within normal limits in patients on maintenance haemodialysis [11, 12, 13, 15].

We showed that the mean concentrations of PSA in group A and group B were not significantly different from that in the control group. Our findings have been supported by several previous studies [12, 13, 17].

SCC showed increased serum levels in group A and group B in the present report. Data on SCC are new and limited in the literature and the conclusions of these reports on SCC alterations in uraemia seem to be similar to ours [12, 13].

In view of the previous data and our results, it may be acceptable to say that there is no general agreement concerning the alterations of available serum tumour markers in uraemic patients. According to our findings we may conclude that some tumour markers, namely SCC, CA 19.9 and CA 125 increase without any clinical evidence of neoplasia. So these markers seem to be unreliable for monitoring malignancies in the presence of renal failure while AFP, CEA and PSA appear to maintain their specificity.

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