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Dental care of autistic children within the non-specialized Public Dental Service

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Abstract

Children with an autistic disorder may need more dental care and may also be more difficult to treat than healthy children. This study compared oral health in autistic and healthy children. Also explored was the dental management of autistic children within the non-specialized Public Dental Service. The study was designed as a case-control study with all cases of autistic disorders aged 3-19 years identified within a primary care area in southwest Sweden. One dentist did a clinical investigation of cases and one control per case. The patients, or their parents, answered a questionnaire.

28 patients were identified and 20 (71 %) agreed to participate in the study. Cases and controls had a similar prevalence of fillings, caries, gingivitis and degree of oral hygiene. However, the need of orthodontic treatment seemed to be greater among the autistic children. According to a standardised assessment, autistic children were less able to cooperate in the dental treatment. Approximately 30% of the cases had occasionally been subjected to specialized dental care. The results of this study indicate that the care provided to autistic children within the non-specialized Public Dental Service is satisfactory, provided that there is access to a paediatric dentist when necessary.

Key words: Autistic disorder, oral health, dental management, Public Dental Service

Svensk sammanfattning

Tandvård av autistiska barn inom distriktstandvården

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Barn med autistisk störning kan ha ett större tandvårdsbehov och kan vara svårare att behandla än friska barn. Detta arbete beskriver tandhälsan hos autistiska barn i jämförelse med friska barn. Dessutom undersöktes hur omhändertagandet fungerar inom distriktstandvården. Undersökningen utformades som en fall-kontroll studie av samtliga identifierade fall med autistisk störning inom Kungsbacka primärvårdsområde i åldrarna 3-19 år. Klinisk undersökning av patienterna och en kontroll per fall gjordes av en tandläkare. Frågeformulär besvarades av patienter eller målsmän.

28 fall identifierades varav 20 (71 %) samtyckte till att delta i studien. Det fanns inga statistiskt signifikanta skillnader mellan fall och kontroller i totala förekomsten av tandfyllningar, karies, gingivit eller graden av munhygien. Dock kunde man se en större förekomst av karierade och fyllda ytor i primära tänder hos kontrollerna medan fallen hade fler karierade ytor i permanenta bettet. Behovet av tandreglering bedömdes vara större bland de autistiska barnen. Enligt en standardiserad skala var dessa barn också betydligt svårare att behandla och visade sig i ca 30 % av fallen någon gång ha haft behov av specialisttandvård. Resultaten av denna studie talar för att vården inom distriktstandvården fungerade på ett tillfredställande sätt för barn med autistisk störning under förutsättning att det vid behov fanns tillgång till specialisttandläkare.

Introduction

According to the current dental legislation in Sweden, all children should have access to the organised dental services and be given the care and treatment according to their individual needs.

A disabled child may suffer from functional impairment that could cause special needs for dental care. In such cases conventional dental care could also be more difficult to carry out. Several investigations have highlighted the difficulties of performing dental care on children with a serious mental disability (3, 17). Gingivitis, disturbed dental development and malocclusions have been reported more frequently in children with neurological disabilities compared to healthy children (7, 11, 12, 14, 15).

Autism was first described in 1943 by *Leo Kanner* (5). Autistic disorders are congenital neurological disabilities that are characterized by impairments in social interaction, communication and behaviour repertoire. This will cause the autistic child problems in its interaction with adults and other children. Autistic disorders present with different degrees of severity, ranging from severe limitations (Kanner's syndrome - infantile autism) to Asperger syndrome, where the aptitude level is often normal or above normal (6, 19). The prevalence of autism is 7-16/10 000 children and of Asperger syndrome 35/10 000 children (4, 5). *Wing* (19) has suggested that the occurrence of autism spectrum disorders, comprising autistic disorder, Asperger syndrom and other autistic conditions may approach 1 % of the school age population.

The entire dental team including dentist, dental hygienist and dental nurse takes part in the annual check-up of the child. It is essential that medical diagnoses and disabilities, if any, are documented and available to all staff in the dental records. This allows the children with special needs to be taken care of in an appropriate way from the very beginning (2). If the relationship between staff and patient is damaged it can take long to repair. This situation may easily arise if the medical disability is not readily recognisable and has not been noted in the dental record.

There are few studies describing how dental care actually performs for children with an autistic disorder. These children need to be taken care of according to their individual needs (1, 9) and the studies available have usually been carried out within the specialized paediatric dental care.

The aim of this study was to study oral health and the needs for dental care in autistic children in a primary care area in Sweden. It was also explored how these children were taken care of and treated within the non-specialized Public Dental Service.

Methods and patients

Study design

The investigation was carried out as a case-control study. The cases were individuals with an autistic disorder, aged between 3 and 19 years, who could be identified at the Childhood Habilitation Unit and the Psychiatric outpatients ward for children and adolescents (BUP) in the primary care area of Kungsbacka, Sweden. A letter of invitation to participate in the study, signed by a doctor and a dentist, was sent to the children's parents/guardians. A reminder was sent after three weeks to those who had not answered. The children who wished to participate were called to the Public Dental Service in Kungsbacka for a clinical examination.

One control per case, matched for gender and age, was recruited consecutively from the regular activities of the same dental clinic. The children were examined by the same dentist with the use of mirror and probe. Posterior bitewings were taken if indicated and if the child did co-operate.

Clinical examination

The dental status of each case and control included data on decayed (dentin and enamel caries) and filled surfaces on primary and permanent teeth, oral hygiene (good, acceptable, bad), gingivitis with bleeding on probing and occlusal function. The objective need for orthodontic treatment was assessed by index groups 1- 4 as recommended by the Swedish Board of Health and Welfare.

The ability of the children to co-operate in dental treatment was assessed according to the following groupings (partly modified observation chart, the Mun-H-Center Gothenburg, 1996):

1. The patient is relaxed. Treatment can be carried out.
2. The patient is fairly relaxed. Treatment can be carried out if adjusted to the patient's reactions.
3. The patient is not relaxed. His or her reactions are pronounced and the treatment is clearly affected.
4. The treatment is more or less impossible or clearly impossible to perform.

Dental records

The records of the public dental service were studied for each case and control with regard to the patient's ability to cooperate in the dental treatment on previous visits, the need of treatment by a paediatric dentist and the need of some kind of sedation to cooperate in the dental treatment. The records were also examined as to the presence of a medical diagnosis for the cases and if any medication was prescribed that could affect oral conditions.

Questionnaire

The patient and/or their parent answered a questionnaire at the clinical check-up. The questionnaire included questions regarding the perception of the

treatment, oral hygiene habits, how the dental health was perceived etc. The questions were drawn from the standard questionnaire 1996, Mun-H-Center Gothenburg.

Statistics

Proportions were studied using the Chi-square test. Since the number of filled and decayed surfaces was not normally distributed, the differences between groups were studied with the Mann-Whitney U test. The number of such surfaces was small and therefore the mean values are given in the text to describe differences between the groups. All tests were two-sided and $p<0.05$ was considered statistically significant.

Ethics

The study was examined and approved by the research ethics committee, faculty of medicine, university of Gothenburg.

Results

Participants

Twenty-eight children aged 4-17 years were identified to have an autistic disorder. Of these 21 agreed to participate, 6 denied, and one individual did not answer. One child willing to participate could not be reached at the address stated. Non-participants did not seem to belong to any specific diagnostic group with either more severe or mild autistic symptoms.

Totally 20 children (71 %) with an autistic disorder took part in the study. They were 12 boys and 8 girls with a mean age of 12 and 10 years, respectively.

Dental status

There were 10 children (50%) without caries among the cases and six (30%) among the controls. The mean number of decayed surfaces was 2.25 among the cases and 2.30 among the controls (p=0.44).
The mean number of filled dental surfaces in primary and permanent teeth was 0.6 among the autistic children and 1.25 among the controls (p=0.08). Table 1 shows the prevalence of caries and filled surfaces in permanent and primary teeth in cases and controls. Five autistic children had one or several sealed fissures, while the controls had none.

Gingivitis with bleeding around one or several teeth was observed in nine of the cases and eight of the controls. The level of oral hygiene was judged to be ”acceptable” in the majority of cases and controls. However, more children in the control group had ”good” oral hygiene. No significant differences were found between the groups with regard to gingivitis and oral hygiene.

Six of 20 children with an autistic disorder had made at least one extra visit to a dentist and received prophylactic treatment, the corresponding number among the controls being one child.

Table 1. The prevalence of caries lesions (surfaces) and filled surfaces in permanent and primary teeth in children with an autistic disorder (n=20) and a control group (n=20).

Type of caries/ fillings	Autistic disorders	Control group
Caries primary teeth		
in dentine	3	10
in enamel	0	4
Caries permanent teeth		
in dentine	12	3
in enamel	30	29
Total caries	45	46
Fillings		
primary teeth	0	12
permanent teeth	12	13

Table 2. The ability of autistic children and controls to co-operate in dental treatment within the Public Dental Service according to a grouping system described in the text (see method-clinical examination).

Ability to co-operate	Autistic disorders	Controls
Group 1	7	19
Group 2	7	1
Group 3	2	0
Group 4	4	0
Total	20	20

A need for orthodontic treatment corresponding to index group 2-4, was found in 12 cases (60 %) and 8 controls (40 %). This difference was not statistically significant (p=0.34). Pronounced teeth grinding facets in two or several teeth were recorded in 4 cases and 7 controls.

Ability to co-operate in dental treatment

Cases and controls differed significantly (p=0.01) in the ability to co-operate in the dental treatment. The autistic children were considerably more difficult to treat (Table 2).

Examination of the dental records showed that 7 out of the 20 autistic children had at least once been referred to a paediatric dentist while none of the controls had had such a referral. Sedation with nitrous oxide-oxygen or general anaesthesia had been used once or several times in five autistic children in dental treatment. One of the controls had been sedated with nitrous oxide-oxygen.

Medical diagnosis and medication

Examination of the dental records showed that some form of medical diagnosis was documented in 17 cases (85 %). The diagnosis was described as “autistic disorder” in 14 cases and as “mental functional im-

pairment" in three cases. A second interview with the parents revealed that nine children suffered from "autism", six had "an autistic disorder or signs of such disorder" and five children had "Asperger syndrome".

Eight of the cases (40 %) were on regular medication, which could affect oral conditions. None of the controls used such medication.

Questionnaire

The questionnaire focused on how the patient and parent perceived the child's oral health and dental treatment. A summary of the answers is given below.

- Dental health was rated as excellent in four cases and six controls.
- Four cases and one control felt that they did not receive the dental care they needed.
- Cases reported more problems than controls in relation to dental treatment.
- The demand for orthodontics was greater among cases than controls.
- The brushing of teeth was more problematic in cases than controls.
- Bad breath was reported by 8 cases and one control.
- Teeth grinding was reported by three cases and 7 controls.
- A special device for oral hygiene was used by six cases and two controls.

The following comments from patients and parents reflect the shortcomings of dental care for autistic children.

- The child needs more frequent clinical examinations.
- It would be appreciated if the dental staff had a better knowledge of this type of disability.
- It is difficult to clean the teeth and the child needs help.
- We have had to wait to long to see a dental specialist.
- The child needs orthodontic treatment. The teeth are difficult to keep clean which causes bleeding gums.

Discussion

There is some uncertainty as to whether all children with an autistic disorder within the area were identified. The 28 identified children represented 0.23 % of the total number of children in the age group. This figure is low compared with the referred prevalence of approximately 1 % of disorders within the autism spectrum among school age children (19). However, we do not know the actual prevalence in the study area and maybe several affected children had not a definite diagnosis of an autistic disorder and could therefore not be invited to the study. The number of children taking part in the study was thus small.

The children with an autistic disorder received their regular dental care at five different public dental clinics in the area. All controls belonged to the same clinic, which may have influenced the results. However, all children used drinking water from the same source containing an optimal content of fluoride to protect against dental caries (approx. 1 ppm).

The results of this study indicate that oral health in children with an autistic disorder was not inferior to that of their healthy controls. This is consistent with the results of other studies (10, 13). We even found that the dental status in the autistic children was superior in the primary dentition. *Kamen & Skier* (8) also reported a low incidence of caries in autistic children. However, it is also possible that the problem of autistic children to co-operate in dental treatment in some cases resulted in an inferior precision of the diagnostic procedures. Some decayed surfaces might therefore have escaped detection.

Fissure sealing was only present in cases and could reflect a more intense prophylaxis among autistic children. Also, the variation of treatment praxis between the clinics where cases and controls were treated could account for this. Several of the cases had been subjected to extra prophylaxis sessions, which may partly be explained by the fact that these children need extra support to adapt to dental care (16).

The difference in need for orthodontic treatment between cases and controls did not reach statistical significance. However, in autistic children there was also a greater demand for orthodontic treatment among the parents, which could indicate a significant difference between the groups at a clinical level. The small size of the study population must be remembered before any general conclusion is drawn. The prevalence of tooth grinding facets was lower in the autistic children, which was supported by the parents' answers in the questionnaire. These findings may be related to the different orofacial muscle function in mentally disabled children as compared to healthy individuals (18).

The autistic children were more difficult to treat and had a greater need for specialized dental care. The access to a paediatric dentist when the need arises is therefore important. Sedation with nitrous oxide-oxygen worked well in two children but not at all for two other children. A high sensitive to the sound level may explain the difference (5).

The medical diagnosis was missing in three of the autistic children's dental records. It is extremely important that the patient's medical history is registered and annually updated so the patients can be treated in an appropriate way (2, 9). It is also essential that any medication used is documented in the dental record. The connection between certain types of medication and their impact on saliva and increased caries activity is well known. Patients using such

medication may need extra preventive treatment. The higher frequency of dentin-caries in permanent teeth among the cases (Table 1) could be explained by the more frequent use of medication in this group.

The results of this study indicate that the dental management of autistic children in the non-specialized Public Dental Service was more or less satisfactory within this primary care area. However, there was a quite obvious need for the service of a paediatric dentist. In order to improve the dental management of these children a regular co-operation with the psychiatric childcare needs to be established. This would mean better chances for early identification of the autistic children and early planning for appropriate and individual programs within the Public Dental Service. The dental team should also learn more about these conditions in order to ensure a high competence.

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References

1. **De Moor R, Martens L.** Dental care in autism. Rev Belge Med Dent 1997;52:44-55.
2. **Ekman A, Ahlborg B, Swanberg K.** Får barn med svåra funktionshinder adekvat omhändertagande i tandvården ? Tandläkartidningen 1994;86:501-7.
3. **Forsberg H, Quick-Nilsson I, Gustavson K-H, Jagell S.** Dental health and dental care in severely mentally retarded children. Swed Dent J 1985;9:15-28.
4. **Frith U.** Autism och Asperger syndrom (Autism and Asperger syndrome). Liber, Stockholm 1998.
5. **Gillberg C.** Autism och autismliknande tillstånd hos barn, ungdomar och vuxna (Autism and autistic-like conditions in children, adolescents, and adults). Natur och Kultur, Stockholm 1992.
6. **Gillberg C.** Asperger syndrome and high-functioning autism. Br J Psychiatry 1998;172:200-9.
7. **Hallonsten A-L.** Tandhälsotillståndet hos handikappade. I: Consensus. Tandhälsotillståndet hos olika folkgrupper i Sverige. Odontologiska Institutionen, Jönköping, LIC förlag, 1991;64-75.
8. **Kamen S, Skier I.** Dental management of the autistic child. Spec Care Dentist 1985;5:20-23.
9. **Klein U, Nowak A J.** Autistic disorder: a review for the pediatric dentist. American Academy of Pediatric Dentistry 1998;20:312-7.
10. **Lowe O, Lindeman R.** Assessment of autistic patients' dental needs and ability to undergo dental examination. J Dent Child 1985;3:29-35.
11. **Oreland A, Heijbel J, Jagell S.** Malocclusions in physically and/or mentally handicapped children. Swed Dent J 1987;11:103-19.
12. **Oreland A, Heijbel J, Jagell S.** Oral function in the physically handicapped with or without severe mental retardation. J Dent Child 1989;56:17-25.
13. **Shapira J, Mann J, Tamari I, Mester R, Knobler H, Yoeli Y, Nawbrun E.** Oral health status and dental needs of an autistic population of children and young adults. Spec Care Dentist 1989;9:38-41.
14. **Storhaug K.** Caries experience in disabled pre-school children. Acta Odontol Scand 1985;43:241-8.
15. **Storhaug K, Holst D.** Caries experience of disabled school-age children. Community Dent Oral Epidemiol 1987;13:144-9.
16. **Swallow NJ.** The dental management of autistic children. Br Dent J 1969;126:128-31.
17. **Vigild M.** Tandplejevaner hos psykisk udviklingshaemmede born og unge . Tandlaegebladet 1984;88:361-5.
18. **Vigild M.** Prevalence of malocclusions in mentally retarded young adults. Community Dent Oral Epidemiol 1985;13:183-4.
19. **Wing L.** Autism spectrum disorders. BMJ 1996;312:327-8.

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