

A survey of oral health in a population of adults with developmental disabilities: Comparison with a national oral health survey of the general population

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Abstract

During 1991, an oral health assessment of 101 adults with developmental disabilities aged from 21 to 53 years was undertaken as part of a broader health survey which also included medical, psychological and nutritional assessments. The study group consisted of a random sample of adults chosen from the developmentally disabled population known to be living in the lower North Shore area of Sydney. This paper describes the results of the oral health assessment and compares them with an oral health survey of the Australian population done in 1987/88. Forty-six per cent of the study group were males (mean age 33.5 years) and 54 per cent were females (mean age 33.0 years). Compared with similar age subgroups in the Australian population, the following factors were more frequently reported in the developmentally disabled group: a dental visit in the last 12 months (65 per cent vs 50 per cent; Odds Ratio (OR) 1.9:95 per cent Confidence Interval (CI): 1.3-2.8); use of public rather than private dental services (42 per cent vs 6 per cent; OR 11.3:95% CI 7.5-16.9); oral mucosal pathology requiring treatment (15 per cent vs 2 per cent; OR 8.5:95% CI 5.2-13.8); severe periodontal disease (16 per cent vs 3 per cent; OR 6.9:95% CI 4.2-11.4); and moderate to severe malocclusion (26 per cent vs 11 per cent; OR 2.1:95% CI 1.3-3.5). Fifty-eight per cent of subjects felt they needed no dental treatment but on examination of the oral mucosa, periodontal tissues and teeth, over 90 per cent were found to require some sort of dental treatment.

Key words: Developmental disability, Down Syndrome, periodontal disease, malocclusion.

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Introduction

Dental disease is a major health problem for people with developmental disabilities (DD).¹

For people with DD there has been an international trend towards a policy of deinstitutionalization and integration into the general community. This has resulted in a reduction in the number of such people residing in large institutions. People have been moved into group homes and many people live at home with family. It is of some concern that the provision of good dental services and supervised preventive practices, that is, toothbrushing and flossing may not have kept pace with these sociological changes. There has also been a big move to open employment for people with DD and in these cases poor oral health causing unacceptable social appearance can be a major handicap.

Preliminary assessment during part of a general health survey of the developmentally disabled in the Northern Sydney area² indicated that dental health was a major problem. Before dental services can be planned, the extent of the problem must be understood, hence the aim of this study which was to describe the prevalence of oral health problems in adults with DD living in the lower North Shore area of Sydney.

Methods

This study was approved by the Ethics Committee at Royal North Shore Hospital (RNSH). RNSH is a tertiary referral hospital with 800 beds, whose main catchment area is the lower North Shore of Sydney (LNS). The hospital has a Health Promotion Clinic for people with intellectual disabilities, staffed by a doctor, a dietitian and a sports physiologist.

The oral health survey was part of a larger health and nutrition survey of adults with DD. Details of

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this study and the sampling frame are described in detail elsewhere.² In brief, the prevalence of disability, defined as IQ below 70, was established in persons aged 20 to 50 years, who lived in the LNS in 1988. The total number ascertained was 346 persons. Each subject's disability was confirmed by psychological assessment. A random sample, stratified for age and sex, was selected from this group. Each subject was asked to attend RNSH for physical examination. The study sample comprised 202 persons, 29 per cent of whom were in institutional care, 31 per cent in supervised group homes in the community and 40 per cent were in private accommodation, either living with relatives or independently. Down syndrome was the single most common identifiable disorder.

The same study group was asked to participate in an oral health survey and 101 persons agreed to take part in the study. The reduced response rate was due to a number of factors: refusals; some subjects had moved out of the area; some were too ill to attend; and others had sought dental care elsewhere.

The oral health assessment followed the protocol used in the National Oral Health Survey³ 1987/88 which was based on World Health Organization guidelines. The assessment was divided into two parts: a behavioural self-administered questionnaire and an oral health assessment. The behavioural questionnaire was administered to the respondents with DD by the research team and they were also asked about personal and demographic information, dental practices (including period since last dental visit, number of dental visits in the last 12 months, number of times teeth brushed in a day) and type of dental services used (private or public). For the subjects with more severe disabilities, information was provided by a carer. The oral health assessment was carried out by a single dental surgeon (AS) with experience in the dental examination of people with DD. The examination covered oral mucosal pathology, malocclusion, periodontal disease, dental caries and treatment needs. Radiographs were not available.

The comparison population was derived from the National Oral Health Survey 1987/88.³ Aggregate data from the National Oral Health Survey were available in tabular format by age category. The comparison group comprised persons living in Metropolitan NSW, aged 20 to 54 years, which corresponded to the age range of the developmentally disabled study group.

Data analysis was performed using SAS statistical software.⁴ The analysis was based on detecting a difference in proportions between the group with DD and the Australian population. For statistical significance testing, the variables were dichotomized and contingency tables constructed to compare the

Table 1. Use of dental services: Summary of oral health survey behavioural questionnaire results comparing the developmentally disabled group with the Australian population for persons aged 20 to 54 years

	Developmentally disabled (%)	Australian population (%)	OR ^{MH} *	95% CI†
Dental visit in the last 12 months	65.3	50.0	1.9	1.3-2.8
Use of public dental services	42.4	6.0	11.3	7.5-16.9
Hold private dental insurance	16.8	49.4	0.2	0.1-0.4

*Mantel-Haenzel Odds Ratios adjusted for age.

†95% Confidence Interval.

groups. Age adjusted odds-ratios and confidence limits were calculated using the Mantel-Haenzel method.⁵

Results

A total of 101 adults who were developmentally disabled were surveyed between 1989 and 1991. There were 47 males and 54 females and the mean age was 33.2 years (range 21-53).

Behavioural survey results

Table 1 is a summary of the use of dental services in the developmentally disabled and the Australian population for persons aged 20 to 54 years. Compared with the general population, the adults who were developmentally disabled were more likely to report a visit to the dentist in the preceding 12 months, more likely to use public dental services rather than a private dentist, and were less likely to hold private dental insurance.

Teeth cleaning and polishing was the most frequently reported therapy in the preceding 12 months (45.5 per cent), followed by filling or crown work (29.7 per cent), dental examination (38.6 per

Table 2. Oral health assessment: Prevalence of oral mucosal pathology and moderate to severe malocclusion among the developmentally disabled and the Australian population aged 20 to 54 years

	Developmentally disabled (%)	Australian population (%)	OR ^{MH}	95% CI
Oral mucosal pathology (requiring treatment)	14.9	2.4	8.5	5.2-13.8
Malocclusion (moderate to severe)	25.6	10.7	2.1	1.3-3.5

Table 3. Oral health assessment: Prevalence of periodontal disease among the developmentally disabled and the Australian population aged 20 to 54 years

Periodontal pathology	Developmentally disabled (%)	Australian population (%)	OR ^{MH}	95% CI
Healthy	18.6	19.6	0.6	0.4-1.1
Bleeding	58.8	38.5	2.2	1.5-3.4
Calculus	34.0	58.4	0.4	0.2-0.5
Pocket 4-5 mm	30.9	20.9	1.8	1.2-2.9
Pocket >5 mm	15.5	3.2	6.9	4.2-11.4

cent) and dental X-ray (9.9 per cent). Eight per cent of subjects received periodontal treatment and 1 per cent had orthodontic treatment.

Oral health assessment results (Tables 2 and 3, Figure 1)

The group with DD were more likely to have oral mucosal pathology requiring treatment (OR 8.5, 95% CI 5.2-13.8) and malocclusion requiring treatment (OR 2.1, 95% CI 1.3-3.5) (Table 2). Examples of oral pathology observed included: peri-apical abscess, candidiasis, gingival hyperplasia, speckled leukoplakia and temporomandibular joint syndrome.

Table 3 shows the prevalence of periodontal disease in the group with DD and as estimated in the Australian population. Mild periodontal disease (gingival bleeding) was more prevalent among the group with DD (58.8 per cent) than the Australian population (38.5 per cent) (OR 2.2, 95% CI 1.5-3.4). Although the prevalence of calculus was lower in the group with DD (OR 0.4, 95% CI 0.2-0.5), they had significantly more severe periodontal disease as indicated by the higher prevalence of periodontal pockets which are caused by loss of connective tissue attachment to the root surface (OR for pocket >5 mm 6.9, 95% CI 4.2-11.4).

Overall, the oral examination identified that 90 per cent of the group required some form of dental

treatment. In the behavioural questionnaire only 42 per cent of the subjects felt that they needed some dental treatment.

Caries experience

Figure 1 shows the mean number of decayed, missing or filled teeth (DMFT index) by age group (20-24 years, 25-29 years, 30-34 years, 35-44 years and 45-54 years) for the group with DD and the Australian population. At all ages those with DD in the population studied had a lower mean DMFT index than the Australian population.

Discussion

This study was part of a general evaluation of health among adults with DD and although the base population was a random sample from the community only 50 per cent agreed to come for the oral health assessment. Those with more problems may have been more likely to attend. This is counterbalanced, however, by the finding that a number of the refusals were due to the fact that dental care had already been sought elsewhere.

While this study indicated that the adults with DD were more likely to have had a dental visit in the preceding 12 months, this may have been biased by the fact that they had undergone a medical assessment as part of the larger health and nutritional survey during which the majority had been advised to seek dental treatment.

People with DD were more likely to seek care in the public dental system which could in part be explained by their lack of private dental insurance. Another possible contributing factor is that this group often require extra time and staff who are used to working with people with disabilities, and these are felt more likely to be available in the public sector.

Overall, the group with DD had more severe periodontal disease (that is, periodontal pockets or bone loss) but a lower level of calculus. This is unusual in that in the general population calculus is usually associated with severe periodontal disease. However, lower levels of calculus in people with DD have been reported previously and particularly in people with Down syndrome.⁶ Down syndrome accounted for 25 per cent of the diagnoses in this study group. Another explanation for the low levels of calculus in this study is that 45 per cent indicated that they had had their teeth cleaned or polished in the preceding 12 months.

A higher level of periodontal disease has been previously reported in people with Down syndrome.⁷ One study⁸ found that oral hygiene was similar for all types of developmental disability, while another¹ study claimed that 'oral hygiene is behind other

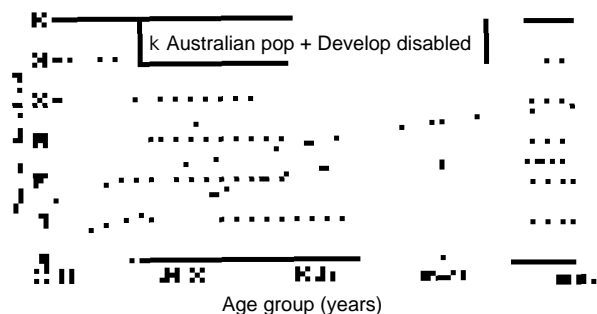


Fig. 1.—Caries experience. Mean number of decayed, missing or filled teeth per person among the developmentally disabled and the Australian population aged 20 to 54 years.

areas of care, not adequately emphasized or given the attention it deserves'. However, people with Down syndrome tend to develop significantly greater severity of periodontal diseases which has been attributed to factors such as lower resistance to bacterial infection, malocclusion, traumatic occlusions, tooth morphology, and lack of normal mastication. In a study by Saxon *et al.*⁹ which used panoramic radiography to measure bone loss, the controls (people with other intellectual disabilities) showed a loss of 20 per cent while people with Down syndrome showed a bone loss of 69 per cent, which was attributed to lower resistance to bacterial infection. Vigild's¹⁰ study of children up to 19 years of age also registered less plaque and calculus but more periodontal disease among those with Down syndrome. However, the research by Reuland-Bosma *et al.*¹¹ has shown that people with Down syndrome are more susceptible to periodontal disease and are more likely to have need for greater oral hygiene than the general population. It was demonstrated that on withdrawing oral hygiene measures the group with Down syndrome had an early acute inflammatory response (day 7) associated with neutrophil dysfunction compared with the later response (day 14) of the healthy 'normal' group.

Lower caries frequency has been reported in people with developmental disabilities.^{8,10} In a controlled study of institutionalized people with Down syndrome,¹² a lower caries rate was found and felt to be related to the electrolytes in the oral secretions and increased pH levels. However, later research has shown that people with developmental disabilities have less caries on approximal surfaces than people with other forms of developmental disability^{7,10} which can be explained by the increased interdental spacing due to hypodontia. In the study by Shaw¹³ the DMFT ratio was lower than that of the general population with the missing component (M) being considerably greater than the filled (F) teeth component. This may be due to the tendency for emergency extractions and the high incidence of congenitally missing teeth rather than conservative treatment, and also to the unnecessary loss of teeth from periodontal disease.¹⁴

An increased incidence of malocclusion in people with Down syndrome has been previously reported^{6,15,16} and has been associated with the under-development of the maxilla (Angle class III malocclusions). On the other hand, people with cerebral palsy tend to have a much higher incidence of extreme maxillary overjet (Angle class II malocclusion) with crowding and cross bite because of the hypertonicity, tongue thrust and constriction of the dental arches.^{16,17} Many of these malocclusions seemed to severely affect normal chewing patterns and in many cases caused mouth breathing which

led to drying of the oral tissues. The resulting facial deformities may be unacceptable socially and contribute to lower self esteem. Despite the greater incidence of oral mucosal pathology and malocclusion, the majority of the patients did not feel that they had any problems requiring treatment. They appeared to have simply accepted it as part of their disability. On further questioning it was ascertained that mastication was very difficult for a number of patients which had led to an unsatisfactory diet of soft foods.

'Tooth retention and the maintenance of a functioning dentition' has been identified by Burt¹⁸ as a dental health goal for the community. He thought that key services should be directed at people with DD as one of the groups most at risk in the community. Dental care for people with disabilities should be at least as good as the rest of the community. Yet despite more frequent dental consultations, the people with developmental disabilities in this present study had significantly more undetected dental disorders requiring specialist treatment. There was a high prevalence of periodontal disease and malocclusion, yet very few of the group had received treatment for this during their visits in the preceding 12 months. In relation to the high levels of periodontal disease, it is recommended that people with DD receive more frequent prophylactic dental care and preventive oral hygiene procedures such as toothbrushing, flossing, and rinsing with a 0.2% chlorhexidine solution. Carers in the community need to be made aware of the importance of dental health and the daily supervision of oral hygiene routines. Dentists and dental studies need to be aware of the problems faced by people who have disabilities, and should also be educated in managing the special needs of this group of patients.

This study has highlighted important differences in oral health and treatment needs in the group with DD compared with the general population. These findings have implications for policy changes that will be required if adequate services are to be provided for this group of the population.

Conclusion

Oral mucosal pathology, malocclusion and periodontal diseases were more common in the group with developmental disabilities than in the Australian population. Calculus and dental caries were less common. Despite more frequent dental consultations the group with developmental disabilities had significant undetected dental disorders requiring specialist treatment.

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