

Oral health status in Down's syndrome - An analysis of a screening camp data

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Abstract

Introduction: Down syndrome (DS) also known as trisomy 21, is a common genetic disorder resulting from an extra copy of chromosome 21. The affected individuals show peculiar physical features, intellectual disability and developmental delays of varying severity.

Aim and objectives: The present study was to assess the oral health status among the children with DS during a general health camp in the community with the aim of developing interventions for improvement of their oral health.

Methodology: A cross-sectional study was conducted in a Government Rehabilitation Institute attached to a medical college in North India. A total of 73 patients were examined by the team of dentists at the camp using

mouth mirror and probe with adequate light in the field setting. The data was entered in a pre-designed proforma to include information on dental caries, malocclusion, trauma and dental anomalies (WHO-1997); gingivitis (Gingival index: Loe and Silness).

Results: A total of 73 subjects were evaluated. Among them 71% were males and 29% females. Gingivitis was present in 65% cases and 12% had DMFT (Decayed-Missing-Filled teeth) of 5 or more. Orthodontic problems including spacing (11%), crowding (23%), Angle class II malocclusion (24%), Angle class III malocclusion (23%), anterior open bite (8%). Oro-dental malformations including macroglossia (15%) and fissured tongue (16%). Other problems identified were

the presence of enamel opacity (5%) and over-retained deciduous teeth (7%).

Conclusion: Clinical data regarding oral health in individuals with DS is important for treatment planning, oral health program implementation and future references for research purpose.

Keywords: Downs syndrome, Dental health survey, Dental hygiene, Malocclusions, anomalies

Introduction

Down syndrome (DS) also known as trisomy 21, is a common genetic disorder resulting from an extra copy of chromosome 21. The affected individuals show peculiar physical features, intellectual disability and developmental delays of varying severity.^[1]

DS is estimated to occur in about 1 in 1100 live births worldwide. The prevalence of DS per 1000 live births was 2.3 in Europe, 1.3 in US, 1.21 in Thailand, 0.14-0.63 in Taiwan and 5.03 per 10000 births in South Korea. The incidence of DS in India is 1 per 850-900 live births.^[2-3]

The distinct craniofacial features of DS include brachycephalic, flat and wide face and nose, almond shaped eye due to epicanthal folds with mongoloid slant, delayed closure of the fontanelles, fine thin sparse hair, frontal bossing, nasolacrimal outflow abnormalities, deficiency in the midface due to maxillary hypoplasia, small chin, proportionally large protruding tongue due to hypotonic lips and disproportionate mouth, short neck with increased skin in the back, small atypical or missing earlobes, middle ear deafness due to otitis media with effusion, strabismus and Brush field spots in the eyes.^[4]

Orofacial features of DS include enamel hypoplasia, supernumerary teeth, atypical eruption pattern, hypodontia or anodontia, ectopic eruption, macroglossia, maxillary hypoplasia, high arched palates, mandibular prognathism, class III malocclusion, open bite, fissured

tongues, angular cheilitis, crowding. The dental anomalies include microdontia, disproportionate crown root ratio, taurodontism, shovel-shaped incisors, peg laterals, slender canines missing or reduced marginal ridges, wrinkled occlusal surfaces of molars.^[5]

As these individuals are immunocompromised, they are more susceptible to periodontal diseases than the general population. There is a decrease in the number of T cells contributing to severe form of periodontal disease and other infections like candidiasis. As the patients of DS have more alkaline saliva they are relatively resistant to dental caries as compared to the general population.^[6]

Due to their peculiar medical problems, these children are not provided optimal treatment as compared to their healthier counterparts.^[1] The intellectual disability of DS individuals varies from mild-to-moderate impairment in Intelligence Quotient (IQ) and in early childhood they suffer from a delay in milestones development. Even though they have better understanding capacity than speech ability their accessibility to health care services is hindered.^[7]

The data about the status of oral health and the dental treatment needs among DS children in India is deficient. The objective of this study was to assess the oral health status among the children with DS during a general health camp in the community with the aim of developing interventions for improvement of their oral health.

Methodology

This cross-sectional study was conducted in a Government Rehabilitation Institute attached to a medical college in North India. The Institute conducted a screening camp for the comprehensive assessment of the treatment needs of subjects with DS and department of dentistry was directed to conduct the dental examination for this purpose. A total of 73 patients were examined by

the team of dentists at the camp using mouth mirror and probe with adequate light in the field setting. The data was entered in a pre-designed proforma to include information on dental caries, malocclusion, trauma and dental anomalies (WHO-1997); gingivitis (Gingival index: Loe and Silness). The informed consent was taken from the guardian or parents accompanying the patients of DS. The data was tabulated, secured and anonymized. It was subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS 20.0 version, Delaware, Chicago, IL, USA).

Results

A total of 73 subjects were evaluated. Among them 71% were males and 29% females. They were stratified into three age groups with 33% patients (<12 years old), 44% patients (13-18 years old) and 23% patients (>18 years old). (Figure 1 and 2)

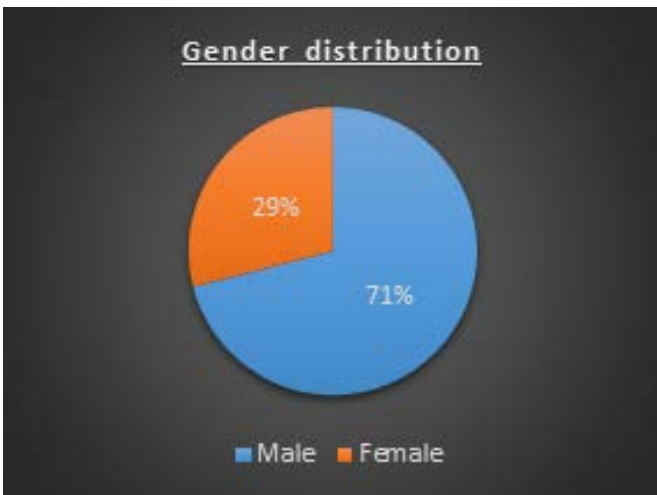


Figure 1: Gender distribution.

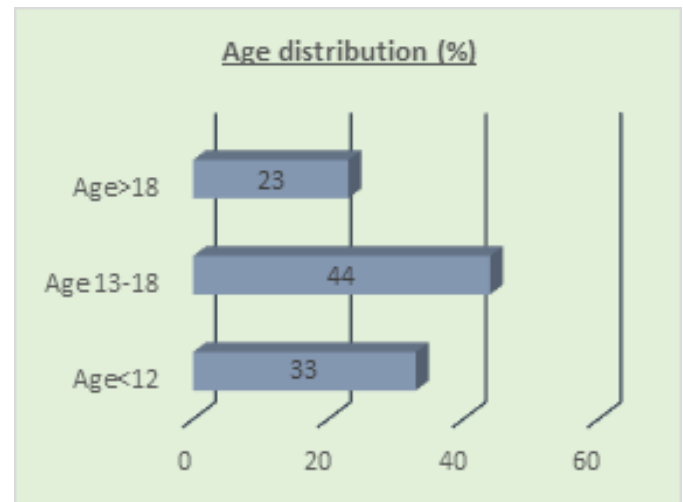


Figure 2: Age distribution (%).

Gingivitis was present in 65% cases. Dental caries was evaluated using DMFT and 12% had DMFT of 5 or more. (Figure 3)

The other dental related problems identified are shown in Figure 4: Orthodontic problems including spacing (11%), crowding (23%), Angle class II malocclusion (24%), Angle class III malocclusion (23%), anterior open bite (8%), Oro-dental malformations including macroglossia (15%) and fissured tongue (16%). Other problems identified were the presence of enamel opacity (5%) and over-retained deciduous teeth (7%).

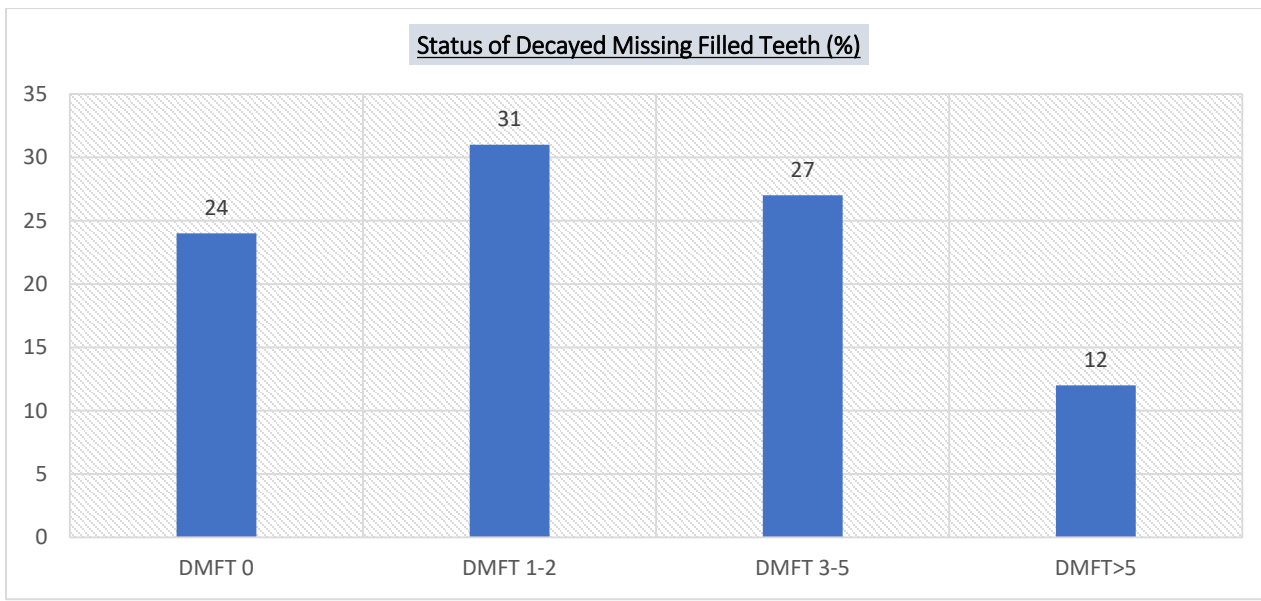


Figure 3: Status of Decayed Missing Filled Teeth (%).

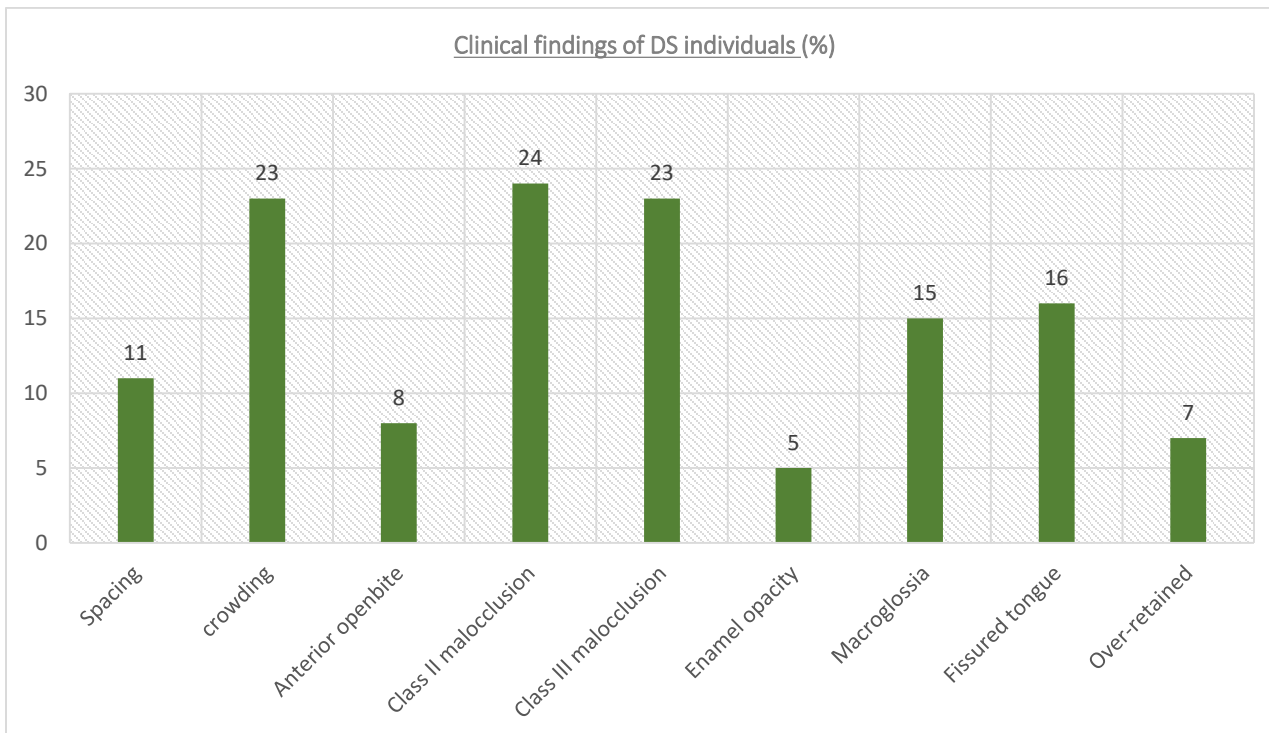


Figure 4: Clinical findings of DS individuals (%).

Discussion

The aim of the study was to identify the various dental manifestations in patients with Down syndrome in a dental camp setting. As the nature of the cognitive problems in DS is a hindrance to the maintenance of oral health, identification of their oral health needs is an

important step in planning their dental treatment and oral health preventive programs.

The skeletal (craniofacial malformations) and soft tissue features associated with DS may contribute to increased tendency to drool, resulting in angular cheilitis, as well as dry mouth and fissured tongue and lips (hypotonic).

Oral diseases including periodontal diseases and candidiasis have also been reported.^[1-2]

In our study, 65% patients had gingivitis and 12% had DMFT of 5 or more. These findings reflected neglected oral hygiene maintenance. Our results are similar to Porovic S et al (2016) who identified 36.4% DS individuals with poor oral hygiene.^[8]

Dentofacial malformations have also been observed in other studies. Our observations are presented in Figure 4 above. Ghaith B et al (2019)^[5] showed 6.6% patients to have class II malocclusion and 66% Class III malocclusion. In our study, DS individuals had similar

proportion of class II and class III malocclusion which is at variance from their study.

Oro dental malformations including macroglossia (15%) and fissured tongue (16%) were reported in our study. Guimaraes CV et al (2008)^[16] stated that children with DS did not have true macroglossia but relatively large tongues compared to the bony confines of the oral cavity. Macroglossia was likely to lead to obstructive sleep apnoea. Other findings including enamel opacity (5%) and over-retained deciduous teeth (7%) were also reported. The different studies were compared as in Table 1.

Table 1: Comparison of different studies

Studies	Dental caries (%)	Gingivitis (%)	Anterior open bite (%)	Class I malocclusion (%)	Class II malocclusion (%)	Class III malocclusion (%)	Enamel opacity (%)	Macroglossia (%)	Fissured tongue (%)	Retained teeth (%)
Current study	70	65	8	-	24	23	5	15	16	7
Cheng RH et al (2007) ^[9]	DMFT mean- 3.3±6.2	-	-	-	-	-	-	-	-	15
Oredugka and Akindayomi (2008) ^[10]	-	-	-	83.3	11.1	5.6	16.7	-	-	-
Shukla et al (2014) ^[11]	-	-	-	-	-	97	-	-	-	-
Porovic S et al (2016) ^[8]	DMFT - 15.96 ±8.08	-	-	-	-	-	-	-	-	-
Sabbarwal B et al (2018) ^[12]	DMFT - 2.38 ± 3.41 DMFT - 1.22 ±	-	21	-	-	-	53	-	-	-

	1.63									
Azfar M et al (2018) ^[13]	68.1	-	-	-	-	-	-	-	-	-
Ghaith B (2019) ^[5]	DMFT - 3.42±4.15 DMFT - 3.32±4.62	-	-	3.8	6.6	66	-	46.2	67.9	-
Amira et al (2019) ^[14]	-	96.6	-	-	-	-	-	-	-	-
Ashwinirani SR (2020) ^[15]	-	-	32	-	-	49	-	53	73	-

The present study revealed the oral health status in DS children and the need to plan a tailored oral health care service for them. There is no consensus among authors regarding dental caries, oral hygiene and gingival health in different studies showing variable results due to lack of uniformity in methodologies used indicating the need for uniformity in analysis of these patients.

Conclusion

Clinical data regarding oral health in individuals with DS is important for treatment planning, oral health program implementation and future references for research purpose. Personal oral hygiene awareness, knowledge and motivation among the parents/caregivers, routine oral health check-ups, preventive strategy with early intervention, parental/caregiver education and support on a regular basis is the key to optimal oral health in this population. Dental professionals, physicians, para-medical staffs, social health workers and other stakeholders should work together in a holistic manner to enhance oral health related quality of life among the population with special health care needs.

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