



Original Research Article

The Prevalence of Oral and Dental Anomalies in Mentally- Retarded Children in Holy Makkah Community

Hanadi Lamfon¹, Hoda Fansa², Mohamed Beyari³, Mahmoud Khalifa⁴

¹Associate Professor of Prosthodontics, Faculty of Dentistry, Umm Al Qura University

²Lecturer of Oral Biology, Faculty of Dentistry, Alexandria University

³Associate Professor of Oral Medicine, Faculty of Dentistry, Umm Al Qura University

⁴Assistant Professor of Maxillofacial Surgery, Faculty of Dentistry, Tanta University

Corresponding Author: Hoda Fansa

Received: 30/04/2015

Revised: 21/05/2015

Accepted: 27/05/2015

ABSTRACT

Objectives: To study the prevalence of some selected oral and dental anomalies in mentally retarded children in Makkah community.

Subjects and Methods: A sample of two hundreds mentally retarded Saudi children, age ranging between 4 and 13 years, was subjected to an intraoral examination for some selected oral and dental anomalies. Out of the 200 children, 84 had Down's syndrome (group I) and 116 had non syndromic mental retardation (group II). The findings were determined and compared to those of two hundreds healthy children (group III) using the appropriate statistical descriptive analysis.

Results: All the mentally retarded children had at least one of the selected oral and dental anomalies. The prevalence of the selected oral and dental anomalies was 100%, 42% and 1% in group I, II, III respectively. Narrow high arched palate was the most prevalent anomaly in group I and III while microdontia was the most prevalent anomaly in group II.

Conclusion: The findings of this study showed a high prevalence of oral and dental anomalies among Down's syndrome children when compared to the non syndromic mentally retarded and the healthy children in Makkah community. Since, these anomalies may be the cause of various dental problems, it seems that the precise diagnosis of these anomalies is essential in the prevention of the consequent problems.

Key words: prevalence, mental retardation, oral, dental anomalies, Makkah.

INTRODUCTION

Cognitive disabilities in childhood are a leading public health problem internationally. ⁽¹⁾ Their impacts on the quality of life and productivity are considerable, not only for the affected children but also for the families and the populations as a whole. ⁽²⁾

Mental retardation (MR) is a developmental disability that first appears in children under the age of 18 years. It is defined as an intellectual functioning level (as measured by the standard tests for intelligence quotient) that is well below average and significant limitations in daily living skills. MR can be categorized as syndromic, if associated with dysmorphic

features, or nonsyndromic, if not associated with dysmorphisms or malformations. ⁽³⁾

While oral problems may have a considerable impact on the general health status and quality of life of otherwise healthy children, their effect on those with mental retardation can be much more serious. The quality of life of children with mental, developmental or physical disabilities may be further compromised by dental problems. ⁽⁴⁾

In the World Health Report Petersen, 2003 ⁽⁵⁾ re-emphasized the need for action to improve the oral health of all the population while reducing inequities through strategies that target groups at highest risk.

The study of the prevalence of dental anomalies in the normal population of Saudi Arabian children revealed that congenital dental anomalies were present in 6% of the healthy children. ⁽⁶⁾ Missing teeth were the commonest anomalies. Supernumerary, fused teeth, talon cusps on permanent teeth and peg-shaped lateral incisors were also found. ⁽⁷⁾

In Saudi Arabia, the prevalence and regional distribution of mental retardation among children has been reported as be 8.9 per 1000 children, a rate similar to that reported in other countries. ⁽⁸⁾

The clinical evaluation of dentofacial abnormalities and oral health status of mentally challenged children revealed that all the mentally challenged children had one or more form of dentofacial abnormalities, 56% of the children were affected with dental caries and 60% had fair level of oral hygiene. ⁽⁹⁾

However, little information is available on the oral and dental anomalies of Saudi Arabian children with special health care needs. Therefore, the aim of the present work was to study the prevalence of some selected oral and dental anomalies in mentally retarded children in Makkah community.

MATERIALS AND METHODS

A sample of two hundreds mentally retarded Saudi children, age ranging between 4 and 13 years were selected. Out of the 200 children, 84 had Down's syndrome (group I) and 116 had non syndromic mental retardation (group II). The study was conducted in Al Amal AlManshod rehabilitation center in Makkah to collect this sample. Families were notified and the study was explained to them by the consultant Pedodontist. Those who agreed to participate in the study were included.

The control group (group III) included two hundred Saudi healthy children of both genders with matching age range. The controls were selected from the patients who attended the Faculty of Dentistry, Umm Al Qura University hospital.

Informed consent was obtained from the parents of the children in both groups to participate in the study. The exclusion criteria included children with a history of loss of teeth due to trauma, or extraction, cleft lip and palate, and radiation of the face. The medical records of the mentally retarded children had been reviewed by the pediatric physician.

Oral and dental anomalies were determined by clinical examination. Each child was examined while seated on a portable chair under day light using a disposable mirror and tongue depressor. No radiographs were taken.

The assessments were made by the same examiner, a consultant in Pediatric dentistry. Some selected oral and dental anomalies were included in the analysis: microdontia, conical teeth, supernumerary teeth, delayed eruption, fissured tongue, macroglossia and narrow high arched palate. The clinical examination procedure for detecting the anomalies was done in accordance with the WHO (1997) ⁽¹⁰⁾ diagnosis criteria.

The data were entered into a computer and analyzed using SPSS statistical analysis package version 16. The prevalence of the selected oral and dental anomalies in each group was tested using the Chi square test. The level of significance was tested at $p \leq 0.05$.

RESULTS

The study sample consisted of two main groups, mentally retarded (MR) group and control group. Among the 200 mentally retarded, 133(65.5%) were males and 67 (33.5%) were females. Out of the 200 controls, 128 (64%) were males and 72 (36%) were females. In each group the age ranged from 4 to 13 years, the mean age for the mentally retarded children and controls were 8.72 and 9.51 respectively (**Table 1**).

Table 1: The mean age of the groups

	Groups	Mean \pm SD	Minimum	Maximum
Age	MR group	8.72 \pm 2.90	3.00	14.00
	Control group	9.51 \pm 2.88	3.00	14.00

Upon examination of the medical records of the mentally retarded children, it was revealed that 84(42%) children had Down's syndrome (group I) and 116(58%) children had non syndromic mental retardation (**Table 2**).

Table 2: Distribution of the groups regarding medical condition

	Groups	Frequency	Percent
MR group	Group I (Down's syndrome)	84	50
	Group II (Non- syndromic MR)	116	
Control group	Group III	200	50
	Total	400	100

All the mentally retarded children had at least one of the oral and dental anomalies; the distribution of the anomalies among the groups was presented in **Table 3**. The prevalence of selected oral and dental anomalies in each group was presented in **Table 4 & Graph 1**.

Table 3: Distribution of oral and dental anomalies found in each group regarding the number

	One	Two	Three	Four	Five	Six	Seven	Zero	Total
GI	6	16	27	17	12	5	2	0	84
GII	29	22	7	0	0	0	0	58	116
GIII	60	28	8	5	0	0	0	99	200
Total	95	66	42	22	12	5	2	157	

Table 4: Comparison between Group I (Down Syndrome), Group II (Non Syndromic Mental Retardation) and Group III (Control) regarding the prevalence of some Oral and Dental Anomilies

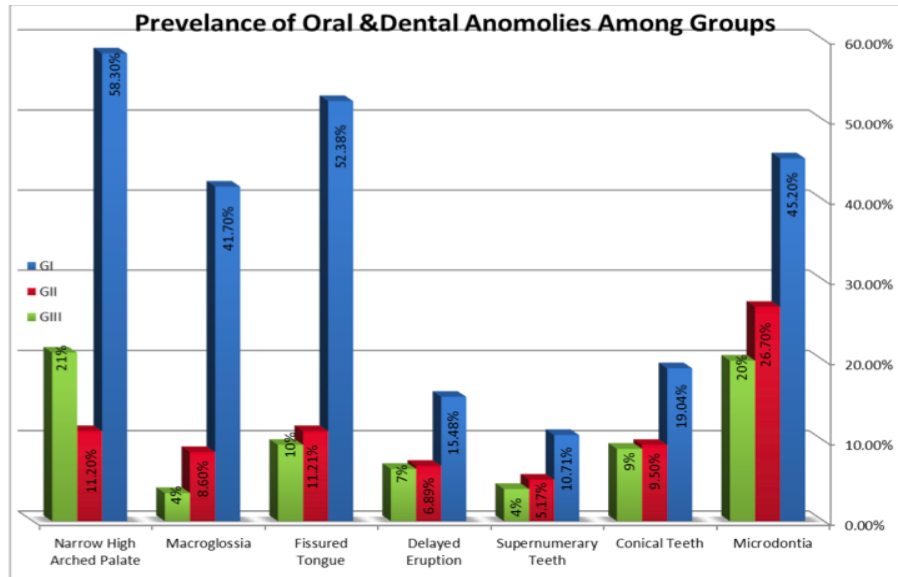
Item	Status	Group I	Group II	Group III	χ^2	P	Sig.
Microdontia	Present	38 (45.2%)	31 (26.7%)	40 (20%)	19.03	<0.001	***
	Absent	46 (54.8%)	85 (73.3%)	160 (80%)			
Conical Teeth	Present	16 (19.04%)	11 (9.5%)	18 (9%)	6.49	<0.05	*
	Absent	68 (80.95%)	105 (90.5%)	182 (91%)			
Supernumerary Teeth	Present	9 (10.71%)	6 (5.17%)	8 (4%)	5.02	<0.05	*
	Absent	75 (89.29%)	110 (94.83%)	192 (96%)			
Delayed Eruption	Present	13 (15.48%)	8 (6.89%)	13 (6.50%)	6.67	<0.05	*
	Absent	71 (84.52%)	108 (93.10%)	187 (93.50%)			
Fissured tongue	Present	44 (52.38%)	13(11.21%)	19 (9.5%)	77.13	<0.001	***
	Absent	40 (47.61%)	103 (88.79%)	181 (90.5%)			
Macroglossia	Present	35 (41.7%)	10 (8.6%)	7 (3.5%)	78.96	<0.001	***
	Absent	49 (58.3%)	106 (91.4%)	193 (96.5%)			
Narrow high arched palate	Present	49 (58.3%)	13 (11.2%)	42 (21%)	61.44	<0.001	***
	Absent	35 (41.67%)	103 (88.79%)	158 (79%)			

χ^2 : Chi Square Distribution, **: highly significant if $p \leq 0.01$, ***: Very highly significant at $p \leq 0.001$,*: significant if $p \leq 0.05$

In group I (n=84), the prevalence of the anomalies was as follows: macroglossia 41.7%, fissured tongue 52.38%, narrow high

arched palate 58.3 %,delayed eruption 15.48 %, microdontia 45.2 % , conical teeth 19.04 %, supernumerary teeth 10.71 %, The most

prevalent anomaly was narrow high arched palate.



Graph 1: The prevalence of selected oral and dental anomalies among groups.

In group II (n= 116), the prevalence of the anomalies was as follow: macroglossia 8.6%,fissured tongue 11.21%, narrow high arched palate 11.2 % delayed eruption 6.89 % , microdontia 26.7 % , conical teeth 9.5 % , supernumerary teeth 5.17 % . The most prevalent anomaly was microdontia.

In group III (n=200), the prevalence of the anomalies was as follow: macroglossia3.5%,fissured tongue 9.5%, narrow high arched palate 21 % , delayed eruption 6.5%, microdontia 20 % , conical teeth 9%, supernumerary teeth 4 % . The most prevalent anomaly was high arched palate.

DISCUSSION

While the prevalence of the oral and dental abnormalities is quite low in normal populations, they occur in the mentally retarded subjects in an incidence five times greater than in the normal population. (11) As compared to other common oral and dental disorders such as dental caries and

periodontal disease, the anomalies present a challenge to the practitioner as they may complicate the treatment of the common dental diseases like caries.

The results of the present work revealed that the prevalence of the selected oral and dental anomalies was high in the Down's syndrome group as compared to the other groups. This is consistent with the clinical study by Rani *et al.*, 2011 (12) who stated that the dentofacial anomalies were more frequent in the Down's syndrome group than in the group of cerebral palsy. Moreover, Krauset *al.*, 1968 (13) made a detailed examination of tooth crowns in 89 mongoloids, 10 non-mongoloid mental defectives and 260 normal individuals. Ages ranged between 6 and 21 years. Their most striking finding was the relatively high frequency of abnormalities in the Down's syndrome subjects compared with the other groups.

The prevalence of macroglossia was41.7%, 8.6 % , 3.5% in group I,II,III respectively. This matches the findings

reported by other studies. ⁽¹⁴⁻¹⁶⁾ However, macroglossia was found in 11.3% of Down's children ⁽¹⁷⁾ which is lower than the prevalence reported in this study. This could be due to the difference in the sample size. Controversy exists between authors regarding whether macroglossia is true or relative. Some authors have speculated that macroglossia is relatively due to the small oral cavity.

Down syndrome patients give the impression of macroglossia. However, this is generally a relative macroglossia as true macroglossia is very rare. The relative macroglossia is attributed to the oral cavity being reduced in size, due to the mid-facial hypoplasia and narrow palate. ⁽¹⁸⁾ The implications of this include difficult accessibility for oral treatment and difficulty with speech and mastication.

The prevalence of the fissured tongue in this study was 52.38%, 11.21 and 9.5% in group I, II, III respectively. This is also a consistent finding to other studies. ^(19,20) These fissures increase by age, leading to food impaction and cause halitosis.

The high arched palate was present in 58.3%, 11.2 % and 21 % in group I,II and III respectively. It was the most prevalent anomaly in group I and III. The cephalometric analysis by Gullikson, 1969 ⁽²¹⁾ revealed that palatal anomalies were present in 64% of the Down individuals. It was speculated that the vault was actually of normal height but the sides of the hard palate were abnormally thick. ⁽²²⁾ However, in those studies as well as the present study this manifestation was evaluated subjectively based on pure clinical observations.

In this study, the presence of the high arched palate in normal population could be explained as the outcome of the thumb sucking habit, mouth breathing or it could be a normal variant which gets better with time. The constricted narrow palate may create

less space in the oral cavity for the tongue, affecting both speech and mastication. ⁽²³⁾ In addition, "V" shaped high vault palates may show soft palate insufficiency and reduce the retention of maxillary prosthesis. ⁽²⁴⁾

The eruption of teeth was delayed in 15.48 % of group I, 6.89 % of group II and 6.5 % of group III. The delay in eruption may take as long as two to three years. In group I (Down's syndrome), the eruption time was clearly delayed in both dentitions with abnormal sequence of teething.

In accordance to our results, delayed eruption of permanent teeth was present in 14.8% with down syndrome as stated by Bhowate *et al.*, 2005. ⁽⁹⁾ Moreover, Aster, 1953 ⁽²⁵⁾ found retarded and abnormal dentition in 93% of his cases. In the present study, this manifestation was evaluated subjectively based on pure clinical observations.

In the present study, the most prevalence anomaly in group II was microdontia. It was present in 45.2 %, 26.7 % and 20 % of group I,II and III respectively. This is in accordance to Desai, 1997, ⁽²⁴⁾ who found that between 35% and 55% of patients with Down syndrome present with microdontia in both the primary and permanent dentition. However, Patel and Boghani, 1985 ⁽²⁶⁾ observed microdontia in 80.3% of the subjects with mental retardation. Therefore, the occurrence of microdontia is quite variable among the studies.

The conic teeth were with a prevalence of 19.04 %, 9.5 % and 9 % in group I, II and III respectively. Our results are in accordance with other studies ^(27,28) which revealed the occurrence of 14 % of conical teeth in individuals with Down syndrome (DS). Moreover, significantly more peg-shaped maxillary lateral incisors ($P < 0.001$) were observed in subjects with DS, compared with non-DS children in Jordan. ⁽²⁹⁾ The reduced tooth size, along

with tongue posture and missing teeth, contributes to interdental spacing in the DS population.

The prevalence of supernumeraries was 10.71 %, 5.17 %, 4% in group I, II,III respectively. The results are in accordance with Liu, 1995 ⁽³⁰⁾ who registered on 152 supernumerary teeth among the 112 patients analyzed, 64.3% had one supernumerary tooth, and 35.7% had two supernumerary teeth.

Summing up, the present study revealed a high prevalence of the selected dental anomalies in the Saudi mentally retarded children as compared to the normal controls. This is in accordance with other studies in KSA which revealed a significantly high prevalence of facial and cranial characteristics among Saudi mentally retarded patients when compared to normal controls of the same population. ^(31,32) Moreover, the frequencies of the different oro-dental anomalies observed in this study when correlated with other studies were found to lie within the reported international figures. ^(12,14,15,28)

The most important aim of dental care for mentally retarded children is to prevent dental disease, thus avoiding the problems associated with the disease and the need for operative treatment. It is necessary to educate the parent so that they understand the importance of dental health for their child and its relationship to his medical condition.

CONCLUSIONS

The presence of the oral and dental anomalies in the mentally retarded children was quite pronounced with the highest prevalence in Down's children. The most prevalent anomaly in Down's children and controls was narrow high arched palate, while in the non-syndromic mentally retarded was microdontia.

Recommendations

It is important that the mentally retarded children should be provided with dental care as soon as their medical condition has been diagnosed and pediatricians should be encouraged to make the appropriate referral and advice the parents on the importance of dental health.

Further studies on the evaluation of the oral health in a larger population of the children with special care are required to fully appreciate the magnitude of the problem.

ACKNOWLEDGEMENT

This work was supported by Institution of Scientific Research and Revival of Islamic, Umm Al Qura University, Makkah, KSA. The authors are grateful to Dr/ AblaArafa, Consultant Pedodontist for her valuable contribution in the field work.

REFERENCES

1. Committee on Nervous System Disorders in Developing Countries. Neurological, psychiatric, and developmental disorders: meeting the challenge in developing countries. Washington, DC: National Academy Press 2000 .
2. Jain M, Mathur A, Sawla L, Choudhary G, Kabra K, Duraiswamy P and Kulkarni S. Oral health status of mentally disabled subjects in India. Journal Oral Science. 2009; 3:333-340.
3. American Association on Mental Retardation. Mental Retardation: Definition, Classification, and Systems of Supports. 10th ed. Washington, DC 2002.
4. American Academy of Paediatric Dentistry. Clinical guideline on management of persons with special health care needs. Paediatric dentistry. 2004; 26(7):77-80 .
5. Petersen PE. World Health Organization global policy for improvement of oral health-World Health Assembly 2007.

- International Dental Journal. 2008; 58: 115-121.
6. Osuji O and Hardie J. Dental anomalies in a population of Saudi Arabian children in Tabuk . Saudi Dent J. 2002; 14(1):11-14.
 7. Salem G. Prevalence of selected dental anomalies in Saudi children from Gizan region. Community dentistry and oral epidemiology. 2006; 17(3):162-163.
 8. El-Hazmi MA, Al-Swailem AA, Al-Mosa NA and Al-Jarallah AA. Prevalence of mental retardation among children in Saudi Arabia. East Mediterr Health J. 2003; 9(1-2):6-11.
 9. Bhowate R and Dubey A. dentofacial and oral health status in mentally challenged children. J Indian SocPedodPrev Dent. 2005; 23: 71-73.
 10. WHO. Oral Health Surveys Basic Methods. 4th ed. World Health Organization. Geneva, Switzerland ;1997.
 11. Kumasawa S, Miyagi A, Nobuaki S, Shindo J and kashima I. Oligodontia: a radiographic comparison of subjects with Down syndrome and normal subjects. SCD Special Care in Dentistry. 1997; 17: 137-141.
 12. Rani S, Sunil MK, Shipra J, Jaskirat K. Dentofacial Anomalies and Oral Hygiene Status in **Mentally Challenged Children**: A Survey. Journal of Indian Academy of Oral Medicine & Radiology. 2011; 23 (1):51-53.
 13. Kraus B S, Clark G R and Oka S W. Mental retardation and abnormalities of the dentition. Amer J MentDefic. 1968; 72: 905-917.
 14. Asokan S , Muthu MS and Sivakumar N. Oral findings of Down syndrome children in Chennai city, India. Indian J Dent Res. 2008; 19 (3): 230-235.
 15. Hennequin M, Allison PJ, Veyrune JL. Prevalence of Oral health problems in a group of individuals with Down syndrome in France. Dev Med Child Neurol. 2000;42:691-8.
 16. Smith GF, Maurice B and Penrose LS. Down's Anomaly. 2nd ed. Churchill Livingstone, Edinburgh; 1976.
 17. Cohen MM and Winer RA. Dental and facial characteristics in Down's syndrome (mongolism). J Dent Res. 1965; 44 (Suppl.): 197-208.
 18. Bittles AH, Bower C, Hussain R and Glasson EG). The four ages of Down syndrome. Eur J Public Health. 2007; 17(2):221-225.
 19. Cohen MM and Cohen MM. The oral manifestations of trisomy G (Down's syndrome). Birth Defects .1971; 7: 241-51.
 20. Ardran GM, Harker P and Kemp FH. Tongue size in Down's syndrome. J MentDefic Res. 1966; 16:160-6.
 21. Gullikson J. Oral status of mentally retarded children. J Dent Child. 1969; 36:133-6.
 22. Horbelt CV. Down syndrome: a review of common physical and oral characteristics. Gen Dent. 2007; 55 (5): 399-402.
 23. Pilcher E. Dental care for the patient with Down syndrome. Down Syndr Res Pract. 1998; 5 (3): 111-116.
 24. Desai SS. Down syndrome: a review of the literature .Oral Surg Oral Med Oral Pathol Oral Radiol Endo. 1997; 84 (3): 279-285.
 25. Aster RJ. Mongolism. Danish Science Press, Ltd. Copenhagen, Denmark; 1953.
 26. Patel AK and Boghani CO. Dental manifestation of Down's syndrome. J Indian Dent Asso. 1985; 57:97-9.
 27. Moraes MEL, Moraes LC, Dotto GN, Dotto PP, Santos LRA. Dental anomalies in patients with Down syndrome. Braz Dental J. 2007; 18: 346-350.
 28. Oredugba FA. "Oral health condition and treatment needs of a group of Nigerian individuals with Down Syndrome," Down's syndrome, Research and Practice. 2007; 12(1): 72-76.

29. Al Habashneh R, Al-Jundi S, Khader Y and Nofel N. Oral health status and reasons for not attending dental care among 12- to 16-year-old children with Down syndrome in special needs centres in Jordan. *International Journal Dental Hygiene*. 2012; 10(4): 259-264.
30. Liu JF. Characteristics of premaxillary supernumerary teeth: a retrospective survey of 112 cases. *J Dent Child*. 1995; 62(4):262-265.
31. Al Shawaf R and Al Faleh W. Craniofacial characteristics in Saudi Down's syndrome. *King Saud University Journal of dental sciences* 2011; 2(1-2): 17-22.
32. Otolaryngological Issues in Down Syndrome Patients from Western Region of Saudi Arabia. *Jumana Y. Al-Aam, Hisham Alem, Ashraf A. El-Harouni. Life Science Journal* 2014; 11(1):122-126.

How to cite this article: Lamfon H, Fansa H, Beyari M et. al. The prevalence of oral and dental anomalies in mentally-retarded children in holy Makkah community. *Int J Health Sci Res*. 2015; 5(6):317-324.

International Journal of Health Sciences & Research (IJHSR)

Publish your work in this journal

The International Journal of Health Sciences & Research is a multidisciplinary indexed open access double-blind peer-reviewed international journal that publishes original research articles from all areas of health sciences and allied branches. This monthly journal is characterised by rapid publication of reviews, original research and case reports across all the fields of health sciences. The details of journal are available on its official website (www.ijhsr.org).

Submit your manuscript by email: editor.ijhsr@gmail.com OR editor.ijhsr@yahoo.com