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ORIGINAL RESEARCH

Prevalence of Malocclusion among 12 to 15 Years Age Group Orphan Children using Dental Aesthetic Index

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ABSTRACT

Objective: The study was done to determine the prevalence of malocclusion and orthodontic treatment among orphan children.

Materials and methods: The sample consisted of 165 orphan children aged between 12 and 15 years. A clinical examination was used to determine the orthodontic treatment need according to the Dental Aesthetic Index (DAI). The statistical software namely SPSS version 15.0 was used for the analysis different parameters as gender and age.

Results: The prevalence of definite, severe and very severe malocclusion was more among males than females and it increased with age. 16.4% subjects needed orthodontic treatment ranging from slight to mandatory form.

Clinical significance: The prevalence and severity of malocclusion was more among orphan children as they are deprived of healthy lifestyle. So, they should be identified and corrective measures instituted at the earliest to prevent a widespread impact on their psychological development.

Keywords: Malocclusion, Dental aesthetic index, Orphans.

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INTRODUCTION

Children are the future of a nation and the strength of a nation lies in a healthy, protected, educated and well developed child population as these will grow up to be productive citizens of the country.[1]

Increased concern for dental appearance during childhood and adolescents to early adulthood has been observed. The social interactions that have a negative effect on self-concept, career advancement and peer group acceptance have been associated with unacceptable dental appearance. In general, societal forces define the norms for acceptable, normal and attractive physical appearance.[2] As orphan children comprises of a deprived and isolated population, this is where malocclusion comes into picture. The word malocclusion literally means badbite and hence deserving special attention to become physically fit, mentally alert and morally healthy, endowed with the skills and motivation needed by society.[3] Malocclusion is 'any deviation from normal occlusion of teeth. The teeth are in abnormal position in relationship to the basal bone of the alveolar process to the adjacent teeth and/or to the opposing teeth.[4]

Malocclusions feature the third highest prevalence among oral pathologies, second only to tooth decay and periodontal disease.[5]

Orthodontic anomalies have been associated with poor periodontal condition and impaired masticatory function. While there are evidence that certain features such as stress, traumatic deep overbite, unprotected incisors and impacted teeth may adversely affect the longevity of the dentition.[6]

As orphans are often denied from oral health information due to number of reasons, for example—in-accessibility, nature of the disadvantage that may necessitate participation of specialized professionals.[7] The various epidemiological studies stated prevalence of malocclusion varies from country to country and among different age and sex group. The prevalence of malocclusion in India varies from 20 to 43% but little attention has been paid to orphan children in India.[8] Hence, the present study was undertaken to assess the prevalence of malocclusion and orthodontic treatment needs at the age of 12 to 15 years orphan children in India.

MATERIALS AND METHODS

An epidemiological cross-sectional study was conducted to assess the prevalence of malocclusion and orthodontic

treatment needs among orphan children in India from March to August 2012. All the orphans were examined and a final sample of 165 subjects (103 males, 62 females) aged 12 to 15 years was obtained.

Inclusion and Exclusion Criteria

Orphan children between the age group of 12 to 15 years who were free of any serious illness and who had no history of trauma or surgery that could affect occlusion were included. Children who were uncooperative and having primary teeth were excluded.

Prior to data collection, a pilot study was conducted among a group of 10 orphan children in order to ensure the level of validity and degree of repeatability (Cronbach alpha = 0.78).

Ethical Issue

All orphans were informed about the purpose of the study and informed consent was obtained. The ethical clearance was obtained from ethical committee of orphanage.

Examination

A specially designed survey proforma was prepared with the help of WHO Oral Health Assessment Form (1997). A full clinical examination was carried out in the orphan's residence using mouth mirror, probe and William's graded probe. William's probe was used to determine the overjet and overbite. For ease of examination all the parameters of dental aesthetic index (DAI) were included. The 10 DAI components are: Missing visible mandibular and maxillary incisor, canine and premolar teeth (number of teeth); crowding in the incisal segment (number of crowded segments 0, 1 or 2); spacing in the incisal segment (number of spaced segments 0, 1 or 2); maxillary diastema (mm); largest maxillary anterior irregularity (mm); largest mandibular anterior irregularity (mm); anterior maxillary overjet (mm); anterior mandibular overjet (mm); vertical anterior open bite (mm); and antero-posterior molar relation (0 = normal, 1 = half cusp, 2 = full cusp).

The scores of DAI parameters were subjected to a DAI regression equation and the points obtained from the regression equation were tabulated to a score for assessing the severity of malocclusion.[9]

Statistical Analysis

A master chart was created in Microsoft Excel (2007) for the purpose of data analysis. The statistical software namely SPSS version 15.0 was used for the analysis of the data. The Chi-square test was used for comparison of severity of malocclusion. The mean DAI scores between males and females, between different age groups were compared using independent student t-test and ANOVA test respectively. The level of significance used was 5% level.

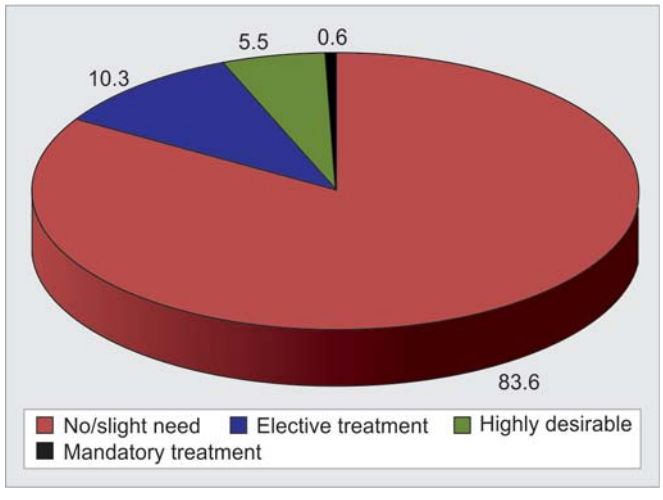
RESULTS

The study population consisted of 165 orphan children aged 12 to 15 years. Out of which 104 (63.1%) were males and 61 (36.9%) were females. For convenience, age was divided into four groups. The total number of children examined among 12 years age group were 53 (32.2%); among 13 years were 30 (18.2%); 14 years were 49 (29.6%) and among 15 years were 33 (20.%).

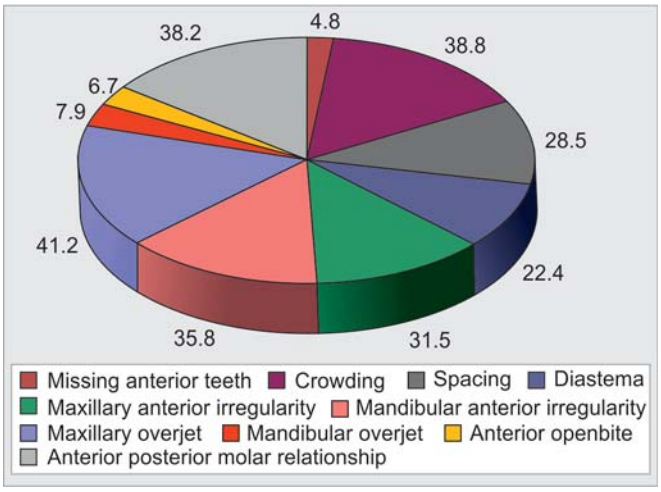
In the present study, overall most of the subjects (95.2) had no missing teeth as mentioned. Crowding was observed among 38.8% orphans. For incisal segment spacing a total of 28.5% had spacing between anteriors and similarly diastema was seen among 22.4% subjects. Among all the values for maxillary and mandibular anterior teeth irregularity were 31.5 and 35.8% respectively. Anterior maxillary overjet was a common finding where as mandibular overjet was rarely seen. Out of the whole sample 93.3% had no anterior open bite and more than 60% had normal molar relation as mentioned in Graph 2.

Graph 1 shows dental esthetic index cut-offs, normal or minor malocclusion with no or slight treatment need (DAI 13-25 years) was found in 83.6% of the sample, definite malocclusion with treatment elective (DAI 26-30 years) in 10.3%, severe malocclusion with treatment highly desirable (DAI 31-35 years) in 5.5% and very severe (handicapping) malocclusion with treatment mandatory (DAI ≥ 36 years) in 0.6%.

This difference in the distribution of DAI across the gender was statistically significant with males having higher



Graph 1: Prevalence of orthodontic treatment needs of study population using Chi-square test (p = 0.000)



Graph 2: Prevalence of orthodontic treatment needs of study population using Chi-square test (p = 0.001)

scores (p = 0.035) (Table 1). According to age wise, the lowest DAI score registered in this study was with 12 years age group and it significantly increased with increasing age (p = 0.028) as shown in Table 2.

DISCUSSION

In this study the DAI was used to assess the prevalence and orthodontic treatment needs among 12 to 15 years old orphan children. The DAI provides a single score linking the public's perception for dental esthetics with objective measurements associated with malocclusion. It has been adopted by the WHO, making it a universally accepted index and it has decision points differentiating treatment priority.[10]

In the present study only 4.8% had missing teeth which is much higher than study conducted by Ajayi EO.[11] In this study around 40% subjects had increased overjet. A similar frequency was also reported in a study conducted by Isiekwe in Nigerians.[12] Crowding, spacing and mid line diastema among all the subjects was higher than results of Ajayi EO study.[11] In the current study prevalence of maxillary and mandibular in anterior irregularity is 31.5 and 35.8% respectively which is similar to Johnson M and Harkness M (2000).[13] The results of the present study in vertical anterior openbite and mandibular overjet was similar to Phaphe et al study among school children in 2012[14] while higher than the findings of Hill PA (1992)[15] showed 5.9% of the children among 12 years and 5.4% of the children among 15 years. This could be attributed to genetic predisposition, variation in growth and disproportion in the dentoalveolar width. Similarly, present study showed higher results of half and full cusp deviation compared to Onyeaso CO (2004).[16]

While comparing according to DAI scores, the results of the current study are in correlation with Nelson S et al (2004).[17] A higher mean DAI score was noticed among males than females. The higher prevalence of malocclusion among males may be attributed to the differences in the adverse habits such as mouth breathing, nail biting, tongue thrusting and thumb sucking, etc. Where as the findings of present study was in contrast with results of previous studies.[18-20]

Table 1: DAI scores according to gender using student t-test

Gender	*No.*	*Mean*	*Std. deviation*	*p-value*
Male	104	19.22	5.225	0.035
Female	61	16.61	4.224	—

Table 2: DAI scores according to different age groups using ANOVA test

Age groups	*No.*	*Mean*	*Std. deviation*	*p-value*
12 years	53	16.62	5.100	0.028
13 years	30	17.57	5.488	—
14 years	49	19.27	4.920	—
15 years	33	19.86	3.907	—
Total	165	17.99	4.875	

CONCLUSION

The prevalence and severity of malocclusion was more in males and it increased with age. Around 16% had malocclusion ranging from definite malocclusion to mandatory type of orthodontic treatment. The neglect of oral health of this socially deprived class of children as evident by the present study further strengthens the idea of impact of social deprivation on the health of an individual. Promotion of appropriate diet for healthy life through well planned health education in school system will go a long way in the promotion of health and dental health in this population. Children having malocclusion should be identified and corrective measures instituted at the earliest to prevent a widespread impact on their psychological development.

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