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Original Research Article

Prevalence of Cross-Bite among School Children in Riyadh City; An Epidemiological Study Conducted in the Schools of Riyadh

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Introduction: Cross-bites involving single tooth may be treated using fixed, as well as removable orthodontic appliances. Removable appliance may result in failure in patients who are not cooperative. Materials and methods: A total of 223 school children were utilized and were divided into two age groups; 6-9 and 9-12 years. Different types of cross-bites were being looked for among the study groups, which included anterior cross-bite, unilateral posterior cross-bite, and bilateral posterior cross-bite. Results: As far as comparison between groups was concerned, the prevalence of anterior cross-bite (30%) and posterior unilateral cross-bite (10%) were found to be higher among 9 - 12 years old children. On the other hand, posterior bilateral cross-bite (15%) and cases having no cross-bite (54%) were found to be higher among 6 – 9 years age group. Conclusion: Anterior cross-bite is highly prevalent among children as compared to posterior cross-bite.

Keywords: Cross-bite, School children, Orthodontics, Appliances.

INTRODUCTION

Cross-bite is a major orthodontic discrepancy affecting many children throughout the world. It develops during the growing stage of the child, which results in functional limitations as well as compromised esthetics in some cases. It is essential to rectify this problem as early as possible, in order to prevent the child from suffering permanent facial asymmetry. Interceptive orthodontic treatment is one of the highly desirable options in rectifying this problem (Kumar et al, 2016). Speaking of treatment, cross-bites involving single tooth may be treated using fixed as well as removable orthodontic appliances. Removable appliance may result in failure in patients who are not cooperative. However, this barrier can be overcome using fixed appliances, which do not depend on patients' cooperation. Examples of these appliances include acrylic inclined planes, bonded resin-composite slopes etc (Prakash & Durgesh, 2011).

Cross-bite is found to be prevalent in studies conducted in many countries. An investigation was carried out in Sao Paulo, Brazil, which aimed to measure the epidemiology of various types of cross-bites among school children. It was revealed that the unilateral posterior cross-bite was seen in majority of the participants. Whereas, the least common type of cross bit was found to be full cross-bite (Da Silva Filho, Santamaria & Capelozza Filho, 2007).Posterior-cross-bite has been increasing in prevalence. A study took place in Turkey to determine the prevalence of posterior cross-bite in adolescents. It was disclosed that the most common type of malocclusion was bilateral cross-bite (Gungor, Taner & Kaygisiz, 2016).

The most common cause of cross-bite is the use of pacifiers or thumb-sucking in children. Another Brazilian study aimed to determine the number of cases with cross-bite especially with the history of pacifier use. The results demonstrated that the unilateral cross-bite was more commonly found in children as compared with bilateral cross-bite (Scavone Jr. et al, 2007). Another investigation conducted in Lahore, Pakistan looked to investigate the prevalence of cross-bite among male and female children. It was revealed that the females had a significantly higher number of cross-bite as compared to the males (Tariq & Tariq, 2015).

AIMS OF THE STUDY

- To determine the prevalence of different types of cross-bites in school children.
- To compare between different age groups of school children.

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MATERIALS AND METHODS

This is a cross-sectional study, which required an examination of school children in Riyadh city. A total of 223 school children were utilized and were divided into two age groups; 6-9 and 9-12 years. Different types of cross-bites were being looked for among the study groups, which included anterior cross-bite, unilateral posterior cross-bite, and bilateral posterior cross-bite. The collected data was analyzed using SPSS version 21. Descriptive statistics including frequencies and Chi-square test were done and results were presented in the form of cross-tabulation.

Clinical Examination

Each dental student examined 55±1 school children using a mouth mirror, tongue retractors, and disposable gloves. We included children from ages 6-12 years, whereas all other age groups were excluded from the study. IRB approval was achieved along with the permissions from selected schools in Riyadh.

RESULTS

We divided the school children in two groups; 6-9 and 9-12 years. The percentages of these participants were 21% and 70% respectively. On the other hand, various types of cross-bites were observed upon clinical examination of these children. It was noted that 30% anterior cross-bite, 9% posterior unilateral and 10% posterior bilateral cross-bites were found to be existing among the children. However, 51% children did not have any kind of cross-bite.

As far as comparison between groups was concerned, the prevalence of anterior cross-bite (30%) and posterior unilateral cross-bite (10%) were found to be higher among 9 - 12 years old children. On the other hand, posterior bilateral cross-bite (15%) and cases having no cross-bite (54%) were found to be higher among 6 – 9 years age group. However, these comparisons were found to be statistically insignificant (p-value: 0.258).

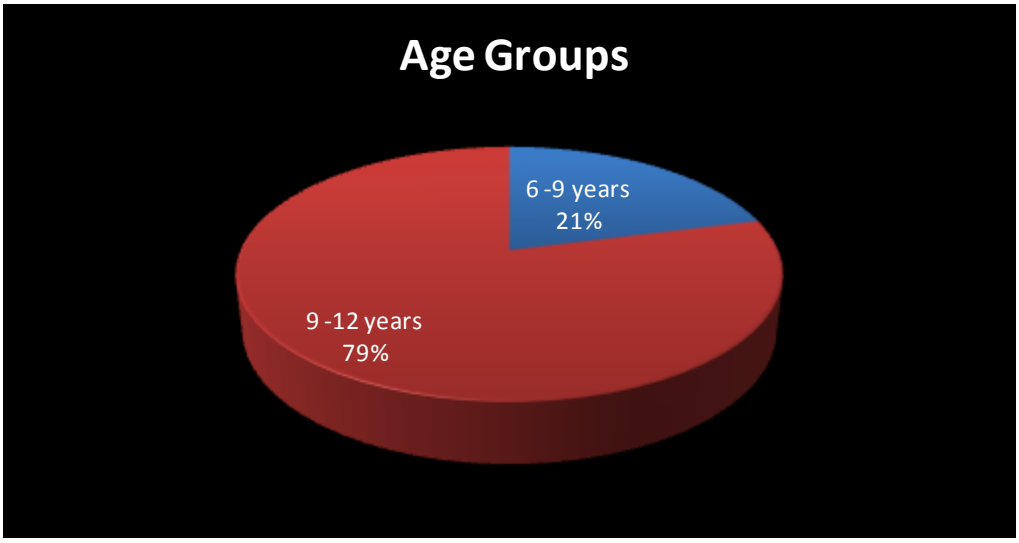

Figure 1: Age group distribution of study subjects

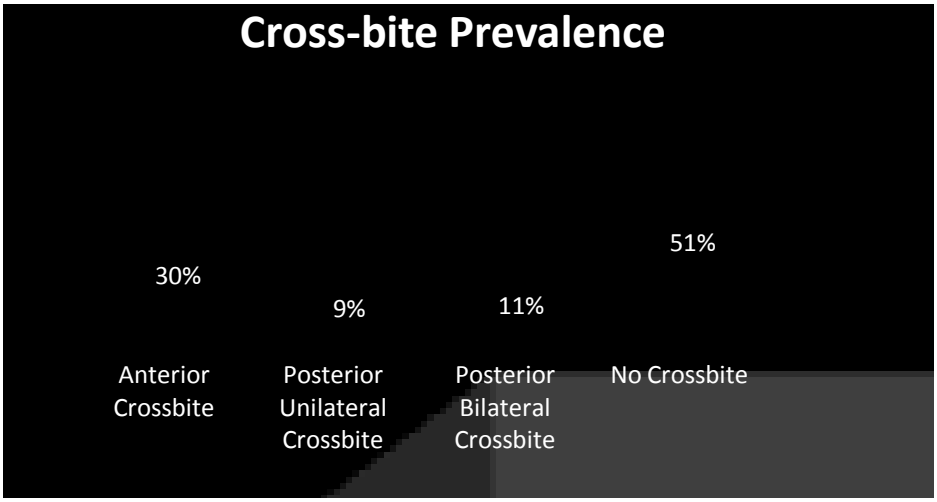

Figure 2: Prevalence of different types of cross-bites among the children

Table 1: Types of cross-bites among different age groups of children

	Type of Cross-bite				
Age groups	**Anterior Cross-bite**	**Posterior Unilateral Cross-bite**	**Posterior Bilateral Cross-bite**	**No Cross-bite**	**P-value**
6 – 9 years	28%	2%	15%	54%	0.258
9 – 12 years	30%	10%	10%	49%	
Total	29%	6%	13%	52%	

DISCUSSION

Cross-bite and its various types can be caused due to habitual reasons among children at a very young age. Factors such as thumb sucking and genetics play an important role in this regard. Cross-bite can occur in children as early as 18 months (Macena, Katz and Rosenblatt, 2009).This study was conducted to determine the prevalence of various types of cross-bites among the school children of Riyadh. Male students were included in this study, which belonged to two age groups as mentioned above.

A study conducted in South India by Kaur, Pavithra and Abraham (2013) revealed the prevalence of different types of malocclusions in adolescent children. Anterior cross-bite was observed in 8% of the total sample, whereas merely 1% of the participants showed posterior cross-bite. When compared these findings with our results, there is a distinct difference as our study revealed a higher prevalence for both types of cross-bites. However, there is a huge difference in the sample sizes of both studies and that could be an important factor affecting the findings.

In majority of the related studies, it was observed that the most common type of cross-bite found in children was anterior cross-bite. Vithanaarachichi and Nawarathna (2017) found a high percentage of children with anterior cross-bite (27%), which was almost similar to that of our finding (29%). On the other hand, a Kuwaiti study demonstrated a relatively low prevalence of cross-bite among children. Merely 2% and 1.5% of anterior and posterior cross-bite respectively were observed among the study subjects (Behbehani et al, 2005).

Several studies have explained the possible etiologies of cross-bites as well as the consequent effects on oral health. Sucking habit was seen as the major cause, whereas the effects of cross-bite included TMJ problems, caries and periodontal diseases (Zegan et al, 2015). However, we did not involve these factors in our study, being the limitation of our investigation. We plan to expand the scope of this study by incorporating a larger sample size and including the above-mentioned factors as well.

CONCLUSIONS

- Anterior cross-bite is highly prevalent among children as compared to posterior cross-bite.
- No significant differences in age groups were found as far as the prevalence of various types of cross-bites was concerned.

CONFLICT OF INTEREST

There is no conflict of interest among the authors.

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