

Prevalence of Occlusal Traits in the Deciduous Dentition of Children of Kaski District, Nepal

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ABSTRACT

Introduction: The prevalence of occlusal traits varies among various populations. Ethnic, genetic and environmental factors are the major contributors, with a role in the specific cause of malocclusion. The aim of this epidemiological study was to assess the prevalence of occlusal traits in the deciduous dentition of children of Kaski District, Nepal.

Methods: A total of 506 children (251 girls, 255 boys), aged 3-5 years, were assessed. The occlusion examination was carried out by three examiners, in the school camps, community dental care centre and general health camps, utilizing a mouth mirror and probe. Intra investigator error was calculated using kappa statistics. The data were analyzed by the statistical program SPSS version 17 using the Chi-square test.

Results: The present study studied occlusal traits of 506 children (251 girls, 255 boys), aged 3-5 years. The study result showed that bilateral mesial step seen in 40.3%, bilateral flush terminal plane in 33.5%, bilateral distal steps in 8.5%, mesial step one side and flush terminal other side in 12.7%, mesial step one side and distal step other side in 2.6%, flush terminal one side and distal step other side in 2.4%, anterior crossbite in 3%, posterior crossbite in 0.4% and non-spaced dentition in 20% children.

Conclusions: Mesial step was the most prevalent followed by straight terminal plane and the distal terminal plane showed least prevalence. There were diverse traits for malocclusion. There was no significant difference ($p>0.05$) in occlusal traits between male and female children.

Keywords: crossbite; distal step; flush terminal plane; mesial step; occlusion.

INTRODUCTION

Occlusion is defined as an proper relationship between teeth of the maxillary and mandibular jaws.^{1,2}

The prevalence of occlusal traits varies in different parts of the world among various populations. Ethnic, genetic and environmental factors are the major contributors, with a role in the specific cause of malocclusion. Knowledge about the distribution of different occlusions may help orthodontic practitioners better understand the existent problem in a geographic location and help them

in the proper orientation and management of treatment possibilities.³⁻¹⁰ The need for information regarding the prevalence of occlusion in males and females and in different age and ethnic groups has provoked many studies in this respect.¹¹⁻¹⁵

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It is possible to find differing prevalence rates of malocclusion in different age groups in the same population.^{16,17}

This study was undertaken to determine the prevalence of occlusion types in 3-5 year old children of kaski district,Nepal.

METHODS

It is a cross-sectional study. Simple random sampling method was adopted for the study. A total of 506 children (251 girls, 255 boys), aged 3-5 years, were assessed. The occlusion examination was carried out by three examiners, in the school camps, community dental care centre and general health camps, utilizing a mouth mirror and probe. Intra investigator error was calculated using kappa statistics. There was no intra investigator error at all. The deciduous second molar relations i.e. Mesial, Flush and Distal terminal planes were recorded both on right and left side. Any malocclusion like, cross bite, no spacing, missing teeth, crowding, if present, were noted down. However self correcting anomalies of deciduous dentition like deep bite, spacing, etc were not considered in the study. The children with proximal caries in teeth with destruction of proximal surfaces of teeth were excluded from study. The data were analyzed by the statistical program SPSS version 17. Descriptive statistics for prevalence percentage were calculated. Chi square test was applied to test the significant difference of proportion of occlusal traits between male and female children.

RESULTS

A total of 506 children (251 girls, 255 boys), aged 3-5 years, were assessed. The occlusion examination was carried and prevalence percentage were calculated. There was no significant difference($p>0.05$) in occlusal traits between male and female children. Thus prevalence percentage for various types of occlusion in overall children population has been presented in the Table 1.

| | | |
|----|--|------|
| 5. | Mesial step one side and distal step other side | 2.6 |
| 6. | Flush terminal one side and distal step other side | 2.4 |
| 7. | Class I Canine relation | 91.2 |
| 8. | Class II Canine relation | 8.8 |
| 7. | Anterior cross-bite | 3 |
| 8. | Posterior cross-bite | 0.4 |
| 9. | Non spaced dentition (anterior) | 20 |

DISCUSSION

The present study studied occlusal traits of 506 children (251 girls, 255 boys), aged 3-5 years. The occlusion examination was carried and prevalence percentage were calculated. There was no significant difference($p>0.05$) in occlusal traits between male and female children. The present study result showed that bilateral mesial step seen in 40.3%, bilateral flush terminal plane in 33.5%, bilateral distal steps in 8.5%, mesial step one side and flush terminal other side in 12.7%, mesial step one side and distal step other side in 2.6%, flush terminal one side and distal step other side in 2.4%, anterior crossbite in 3%, posterior crossbite in 0.4% and non-spaced dentition in 20% children.

A study of five hundreds and twenty five of 3-4-year-old children in nursery schools and day-care centres was carried out by Otuyemi et.al to assess occlusal relationships and the presence of spacing or crowding of teeth. No significant differences in occlusal relationships were found between boys and girls ($P > 0.05$). Bilateral straight terminal planes of molars and class 1 canine relationship were the most prevalent features (74.5% and 73.3% respectively). Most of the children had 'normal' vertical and transverse occlusal relationships. The most common sites of spacing were mesial to maxillary canines and distal to mandibular canines. 32% of the children were found to have generalized anterior segment spacing, 4% showed exclusively anthropoid spaces, and 18% had either contact between all the teeth or crowding in the anterior region.¹⁸

Ferreira et.al also carried out a research on prevalence of normal occlusal traits on deciduous dentition. The aim of this research was to study the normal occlusal patterns of deciduous dentition in Brazilian preschool children. The sample consisted of 356 preschool children, of both genders, aged 3-5 1/2 years from the urban zone of Salvador, Bahia. The occlusion exam was carried out by two examiners, in the classroom, utilizing a wooden spatula. The data were analyzed by the statistical program EPI-INFO 6.02 using the Chi-squared test. The frequency of the type I arch was 43.3% for the upper

| Table 1. Distribution of different types of occlusal traits. | | |
|--|--|-----------------------|
| SN | Occlusal traits | Prevalence Percentage |
| 1. | Bilateral mesial step | 40.3 |
| 2. | Bilateral flush terminal plane | 33.5 |
| 3. | Bilateral distal step | 8.5 |
| 4. | Mesial step one side and flush terminal other side | 12.7 |

and 46.3% for the lower arch. The frequency of the type II arch was 56.7% for the upper and 53.75 for the lower arch, however, no difference between genders was noticed. The distribution of primate spaces was: 89.9% for the upper and 67.1% for the lower arch. This prevalence decreased significantly as age increased ($p < 0.01$). Normal canine relationship was found in almost 60% of the children for the right and left sides. Out of 712 evaluated terminal planes, 55.9% presented mesial terminal step for the primary second molars, 37.9% straight terminal plane and 6.2% distal step. The results permitted to conclude that the presence of generalized spacing between incisors, commonly described by other authors, was not the most prevailing condition for both arches in this sample. On the other hand, primate spaces were the most common ones. The most frequent normal occlusal patterns for canine and molar relationships were found to be the Class I patterns.¹⁹

Onveaso Co had done a study in primary dentition of Nigerian children and compares the antero-posterior occlusal pattern and arch spacing in the primary dentition of Nigerian children from the 3 major ethnic groups in the country Ibo, Yoruba and Hausa tribes. This is a cross-sectional epidemiological study involving eight randomly selected pre-primary schools and day-care centers in Ibadan and Lagos cities of Nigeria. Two hundred and sixty-nine 3-5-year-old children consisting of 125 (46.5%) males and 144 (53.6%) females were examined. A two-stage sampling method was adopted. The occlusions of the children were assessed according to the criteria by Foster and Hamilton, under natural

illumination in their schools premises. Chi-square statistic was used to analyse the data. No statistically significant differences were observed in the molar and canine relationships among the ethnic groups ($p > 0.05$). Highly statistically significant differences were noted in relation to spacing of the arches ($p = 0.001$) in both the anterior and posterior segments. Also, statistically significant differences were found in relation to post canine spaces ($p < 0.05$) but not with pre-canine spaces. Spacing was found most in the Ibo ethnic group children. Although no statistically significant ethnic differences were found in the molar relationships of the study sample, very statistically significant differences were revealed in the spacing of the arches in both incisor and molar regions.²⁰

CONCLUSIONS

The present study result showed that bilateral mesial step seen in 40.3%,bilateral flush terminal plane in 33.5%,bilateral distal steps in 8.5%,mesial step one side and flush terminal other side in 12.7%,mesial step one side and distal step other side in 2.6%,flush terminal one side and distal step other side in 2.4%,anterior crossbite in 3%,posterior crossbite in 0.4% and non-spaced dentition in 20% children.

Thus it was concluded that mesial step was the most prevalent followed by straight terminal plane and the distal terminal plane showed least prevalence. There were diverse traits for malocclusion. There was no significant difference($p > 0.05$) in occlusal traits between male and female children.

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