Malocclusion and occlusal traits among adolescents in Kashmiri population: An epidemiological study

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Abstract

Introduction: Malocclusion is an occlusion in which there is malrelation between the arches in any three planes of space or in which there are anomalies in tooth position beyond the limits of acceptable norms. Although dental malocclusion is not a life threatening condition, the psychosocial distress, impaired mastication and poor periodontal conditions associated with it, need to explore the prevalence of malocclusion in different ethnic groups. Regarding the fact that till date no data has been recorded, on the prevalence of malocclusion in the valley of Kashmiri.

Material and Methods: This was a cross-sectional epidemiological study conducted on 1800 children aged between 12-18 years. The classification used to record the malocclusion was Ackermann-Prof.

Results: A sample of 1800 subjects was examined out of which 1012(56.22%) were males and 788(43.77%) were females. (81.85%) subjects had class I molar relationship, 290(16.05%) subjects had class II molar relationship and 38(2.1%) subjects had class III molar relationship.

Conclusion: 81.85% subjects had class I molar relationship, 16.05% subjects had class II molar relationship and 2.1% subjects had class III molar relationship.

Keywords: Malocclusion, Kashmiri, alignment, transverse deviation, vertical deviation, anteroposterior deviation

Introduction

Malocclusion is an occlusion in which there is malrelation between the arches in any three planes of space or in which there are anomalies in tooth position beyond the limits of acceptable norms [1]. Malocclusion has a large social and psychological impact on the individual and society [2-3] the appearance of the mouth and the smile [lays a significant role in judgements regarding facial attractiveness [4]. The valley of Kashmiri, is an active agriculture place with people from a similar spectrum of cultural and socioeconomic background. To date there is no available data on status of prevalence of malocclusion in the valley in particular. Significance of any disease in a particular area can be gazed by its prevalence. This becomes even more important for developing country like India in general, where oral health program and preventive measures are far from satisfying. There are several epidemiological study in literature [5-14] that give an insight on the prevalence of different traits of dental malocclusion in different ethnic groups. The prevalence of malocclusion among Indian children has been reported as high as 90% in Delhi and as low as 19.6% in Madras [7].

An understanding of epidemiological status of various traits of malocclusion among particular population is important for planning the need and provision for orthodontic service to enhance quality of life. Since maloccluded dentition can cause disturbances in oral function and cause psychological problems due to impaired dentofacial esthetics [15]. Dental malocclusions exhibit the third highest prevalence among oral pathologies, second only to tooth decay and periodontal disease and therefore rank third among worldwide dental public health priorities. Although dental malocclusion is not a life threatening condition, the psychosocial distress, impaired mastication and poor periodontal conditions associated with it, need to explore the prevalence of malocclusion in different ethnic groups. Regarding the fact that till date no data has been recorded, on the prevalence of malocclusion in the valley of Kashmiri.
Aim and Objectives
The aim of the study is to estimate the prevalence of malocclusion and its objectives is to
1. Determine the priority and need of orthodontic treatment modalities according to the severity of malocclusion and resources available.
2. Estimate the need of treatment in particular population and gain a view for training adequate man power to meet the demands.16
3. Adopt a more detailed and accurate plan for the prevention and treatment of this problem.

Material and Methods
This was a cross-sectional epidemiological study conducted on 1800 children aged between 12-18 years. Informed consent was obtained from the subjects, their parents and from the appropriate school authority. The subjects were divided into 2 groups: group I (males) and group II (females).

Inclusion criteria
1. All permanent teeth must be present irrespective of third molars.
2. No systemic disease.

Exclusion criteria
1. No previous orthodontic treatment,
2. Rampant caries, multiple missing teeth, mutilated malocclusion.
3. Craniofacial anomalies.

Ethical clearance was obtained from the Ethical committee (Govt. Dental College and Hospital Srinagar, J & K). The examination of students was done at their respective schools, using sterile mouth mirror and probe under natural light. The classification used to record the malocclusion was according to Ackermann-Profit17.

A. Alignment
i. Midline
0- Midlines coinciding,
1- < half the lower incisor width,
2- >half the lower incisor width.

ii. Spacing
0- Absent,
1- Midline diastema.
2- Anterior spacing.
3- Generalized spacing.

iii. Crowding
0- Absent.
1- Anterior crowding.
2- Posterior crowding.

B. Transverse deviation
Crossbite
0-No crossbite,
1-Single tooth crossbite,
2- Two or more teeth crossbite,
3- Anterior teeth crossbite,
4- Posterior Unilateral crossbite,
5- Posterior Bilateral crossbite.

C. Anteroposterior deviation
i. Molar relation
1- Class I,
2- Class II [a] div1 [b] div2 [c]subdivision,
3- Class III [a]sub division.

ii. Overjet
1- Normal overjet [1-3mm]
2- Moderate overjet [3-5mm]
3- Increased overjet (>6mm)
4- Reduced overjet (<1mm)
5- Reverse overjet

D. Vertical deviation
i. Overbite
1- 1/3rd of lower incisor overlap
2- 2/3rd of lower incisor overlap
3- Completely locked lower incisors
4- Edge to edge bite

ii. Open bite
0-Openbite absent
1- Open bite <2mm
2- Open bite >4mm

The measurements were done for both the groups.

Statistical Methods
The recorded data was compiled and entered in a spread sheet (Microsoft excel) and then exported to data editor of SPSS version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean ±SD and categorical variables were expressed as frequencies and percentages.

Results
A sample of 1800 subjects was examined out of which 1012(56.22%) were males and 788(43.77%) were females (Table 1). In case of male subjects 691(68.3%) had no midline discrepancy whereas 254(25.1%) had midline discrepancy of less than half the width of lower incisor and 67(6.6%) had midline discrepancy of greater than half the width of lower incisor. In overall sample 1240(69%) had no midline discrepancy whereas 469(26.2%) had midline discrepancy of less than half the width of lower incisor and 91(4.8%) had midline discrepancy of greater than half the width of lower incisor (Table 2), 1442 (80.1%)subjects had no spacing whereas 138(7.65%) subjects showed midline diastema, 170(9.4%)subjects showed anterior spacing and 50(2.85%) subjects showed posterior spacing (Table 3), 865 (48.05%)subjects had no crowding 806(44.85%)subjects showed anterior crowding and 129(7.1%) subjects showed posterior crowding (Table 4), 1476(81.85%) had no crossbite, 191(10.6%)subjects showed single tooth cross bite, 51(2.9%) showed cross bite of two or more teeth, 47(2.65%) showed anterior cross bite, 24(1.35%)subjects showed posterior unilateral cross bite and 11(0.65%) subjects showed posterior bilateral cross bite (Table 5), 1472(81.85%)subjects had class I molar relationship, 290(16.05%) subjects had class II molar relationship and 38(2.1%) subjects had class III molar relationship (Table 6). In overall sample 1057(58.75%) exhibited normal overjet of 1-3mm 411(22.8%) exhibited overjet of 3-5mm, 118(6.55%) exhibited overjet greater than 6mm, 171(9.5%) exhibited overjet of less than 1mm and 43(2.4%) exhibited reverse overjet (Table 7), 713 (39.65%)
subjects were found to have one third of lower incisor overlap, whereas 696(38.65%) subjects were found to have two third of lower incisor overlap. 247(13.75%) had Completely locked lower incisors and 144(8.0%) showed edge to edge overbite (Table 8).

Table 1: Sample distribution

<table>
<thead>
<tr>
<th>Sample</th>
<th>Number (N)</th>
<th>Percentage (%)</th>
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<tbody>
<tr>
<td>Male</td>
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<tr>
<td>Female</td>
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<td>Total</td>
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Tables 2: (Midline)

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<td>%</td>
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</tr>
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<td>68.3</td>
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<tr>
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<td>254</td>
<td>25.1</td>
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<td>2</td>
<td>67</td>
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<tr>
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<td>788</td>
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Tables 3: (SPACING)

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<td>80.3</td>
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<tr>
<td>1</td>
<td>79</td>
<td>7.9</td>
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<tr>
<td>Total</td>
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Tables 4: (CROWDING)

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Tables 5: Cross Bite

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Tables 6: (Classification)

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<td>N</td>
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<td>100</td>
<td>788</td>
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Tables 7: (Overjet)

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<th>Overall</th>
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<td>%</td>
<td>N</td>
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<tr>
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</tbody>
</table>

Discussion

Although lot of studies have been done on prevalence of malocclusion and its different types. But it is difficult to compare these findings because of the great variation in the methods used. [18, 19] So this study was done using Ackermann-Profit [17] system of classification of malocclusions. This system records malocclusion in all the three planes (i.e., sagittal, transverse and vertical planes). The present study included 1800 subjects in the age group between 12-18 years. The subjects were divided into two groups: group I [males, N=1012(56.22%)] and group II [females, N=788(43.77%)]. In overall sample 69% had no midline discrepancy whereas 26.2% had midline discrepancy of less than half the width of lower incisor and 4.8% had midline discrepancy of greater than half the width of lower incisor and there was no significant different in between males and females in midline discrepancy. These results were similar to results of previous study [20].

There was no spacing in 80.1% subjects whereas 7.65% subjects presented with midline diastema, 9.4% subjects showed anterior spacing and 2.85% subjects showed posterior spacing. There was no difference in males and females with respect to spacing scores. The present findings suggests that anterior spacing is more common than posterior spacing. The above results were similar to previous studies [20, 16].

There was no crowding in 48.05% sample although 44.85% sample size showed anterior crowding and 7.1% sample showed posterior crowding with no significant different between males and female subjects. It shows that anterior crowding is much more common in Kashmiri population than posterior crowding. Thilander et al. [8] had reported 52.1% prevalence of crowding which is almost similar to our study. Similar results were also found by tek et [6] and singh et al. [16].

In the present study it was found that there is no cross bite in 81.85% subjects whereas 10.6% subjects showed single tooth cross bite, 2.9% showed cross bite of two or more teeth, 2.65% showed anterior cross bite, 1.35%showed posterior unilateral cross bite and 0.65% subjects showed posterior bilateral cross bite with no significant different between male and female subjects. The present findings show that single tooth cross bite is more common than multiple teeth cross bite and posterior unilateral cross bite is more frequent than posterior bilateral cross bite. Borzabadi-Farahani et al. (2009) had reported prevalence of anterior cross bite of 8.4% which is concordance to our study whereas few studies have found more prevalence of posterior cross bite than ours [14, 21, 22].

81.85% subjects had class I molar relationship, 16.05% subjects had class II molar relationship and 2.1% subjects had class III molar relationship. The distribution of Class II malocclusion in this study was 16.05%, comparable with study conducted by Lew et al., [23] Lagana G et al. [9] and Jacob and Matthew [20] whereas few studies have found higher frequency of class 2 malocclusion than our study. [13, 14] 2.1% subjects showed class III malocclusion which is in accordance with various studies [9, 14], although few studies showed lower
values for class III malocclusion than our study [12, 21].

Present study showed that about 59% of total sample showed normal overjet (1-3 mm) which were similar to previous studies [16, 20] whereas 22.8% showed an overjet of 3-5 mm similar to above studies [14, 20]. Corruccini et al. [24] found that 8% had more than 5 mm of overjet and we found that 6.5% subjects showed overjet of greater than 6 mm, 9.5% showed overjet of less than 1 mm and 2.4% showed reverse overjet.

Prevalence of normal overbite (1/3 rd of lower incisor overlap) was found in 39.6% subjects which was higher than found by Singh et al.[10], around 39% subjects showed overlap of about 2/3 rd of lower incisor which is similar to previous studies [16, 20]. Complete overbite was seen in about 14% subjects and 8% subjects showed edge to edge bite.

Conclusion

The following conclusions were drawn from the present survey.

1. There was no spacing in 80.1% subjects whereas 7.65% subjects presented with midline diastema, 9.4% subjects showed anterior spacing and 2.85% subjects showed posterior spacing.

2. There was no crowding in 48.05% sample although 44.85% sample size showed anterior crowding and 7.1% sample showed posterior crowding.

3. There is no cross bite in 81.85% subjects whereas 10.6% subjects showed single tooth cross bite, 2.9% showed cross bite of two or more teeth, 2.65% showed anterior cross bite, 1.35% subjects showed posterior unilateral cross bite and 0.65% subjects showed posterior bilateral cross bite.

4. 81.85% subjects had class I molar relationship, 16.05% subjects had class II molar relationship and 2.1% subjects had class III molar relationship.

5. 59% of total sample showed normal overjet (1-3 mm), 22.8% showed an overjet of 3-5 mm, 8% had more than 5 mm of overjet and we found that 6.5% subjects showed overjet of greater than 6 mm, 9.5% showed overjet of less than 1 mm and 2.4% showed reverse overjet.

6. Normal overbite (1/3 rd of lower incisor overlap) was found in 39.6% subjects, around 39% subjects showed overlap of about 2/3 rd of lower incisor. Complete overbite was seen in about 14% subjects and 8% subjects showed edge to edge bite.

References


