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Original Research Article

An Analysis of the Orthodontic Awareness and Perceived Needs for Treatment of Two Tribal Populations as Related to the Prevalence of Malocclusion

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Abstract

Background: On the path to progress, Man often experiments with options that are different from those already existing, be it a lifestyle or food habits, or aspects related to luxury or convenience. Nature, on the other hand, tries to allow the survival of certain genetic attributes that are best suited to the changing environment. It is interesting to acknowledge that if one were to consider the simple lifestyle of the tribes as in contrast to that of a city dweller, one must pause to wonder if the multitude of dental problems ranging from decay to malocclusion is a sad consequence of the path taken to progress. However, as true progress is made by introspection and retrospection, it is always possible to retain the best practices and pass these on to future generations. The pattern of maturity and mental growth starts to settle during adolescence period of life. Here, the individual reinforces the habits, beliefs, and opinions based on social interaction with the peer group and external community. The major trend includes the patterns of growth and development, including the alignment of teeth and perceptions of esthetics.

Aim: The main goal of this epidemiological survey was to evaluate the orthodontic malocclusion status and perceived treatment needs of two populations of adolescent trials screened in the Maharashtra District.

Material and Method: The sample chosen for this epidemiological survey comprised a total of 400 higher secondary school students aged 13 to 19 years (200 boys and 200 girls) & a total of 300 higher secondary school students aged 13 to 19 years (150 boys and 150 girls) Maharashtra District none of whom had undergone any prior orthodontic treatment. The occlusion of the students was assessed and classified into the categories of ideal occlusion and Angle's Class I, II & III malocclusions. Other parameters noted were overjet, overbite, crowding, spacing, and midline diastema. The school-going children of standards 8th to 12th in the average age range of 13 to 19 years were selected from the schools after obtaining the necessary permission from the tribal authorities.

Results: Statistical results of Pearson's chi-square test based on the data obtained from the Division showed no significant relationship between the prevalence of malocclusion and gender in the tribal population. During the examination, certain questions were posed to assess orthodontic awareness, self-perceived dental aesthetics, and perceived treatment needs. While 75% were aware of orthodontic treatment, only 25% had a perceived need for treatment. It may be due to the conduction of regular orthodontic awareness camps in the regions of Maharashtra district by which the tribes over there were aware of orthodontic treatment.

Conclusion: There are two essential conclusions from the data gathered in this study about the orthodontic treatment needs of the populations evaluated. On the one hand, there were a

few adolescents with orthodontic awareness on account of knowledge gained from media, schooling, and dental camps who were keen on an orthodontic correction but who expressed a degree of reluctance solely based on factors like duration, number of treatment visits, expense, and remote access to treatment.

Keywords: Malocclusion, Periodontitis, Climatic Zones, Cassidy, Susanne, Carels, Mossey, Vieira & Chakan, Overjet, Overbite, Crowding, Spacing, And Midline Diastema.

Introduction

Among the various undermining factors of human resources of a region, dietary deficiencies are closely followed by health conditions linked to poor oral hygiene or poor dental health. One component of general health that is neglected the most is oral health, as it is most often attributed with the most negligible significance. There is often more inadequate oral hygiene in situations predisposed by malocclusion as the self-cleansing mechanisms function at a compromise. So, it is often seen that a person with malocclusion might also have concomitant periodontal issues or dental caries. [1] Various malocclusions like spacing, crowding, deep bite, or crossbites will cause accumulation of food in between the teeth leading to gingivitis followed by Periodontitis, sometimes accompanied by caries.1 So dental anthropology, a sub-discipline of physical anthropology, examines a range of variables related to tooth (crown) size, number, and any irregularities in alignment and arrangement of teeth in each arch to analyze prevalence patterns of malocclusion.

India is an abode to many tribes having exciting and diversified origins, socioeconomic traditions, an assortment of occupations, and a unique linguistic heritage. [2] One-fourth of the global Adivasi population, which stands at 104,281,034 (census of 2011), resides in India. These tribal populations are spread across 15% of India's geographical area. [3] There are 63 Indian tribal communities whose population is less than 500 individuals. Most tribal communities reside in hilly regions and inhabit climatic zones. The South Indian tribes have their origins from the Ancestral South Indians and, in turn, from the Ancient Ancestral South Indians and the Indus Valley Civilization. [4-8]

Most of these tribes practice endogamy, with their culture dictating marriages within the same community. There has thus been both cultural isolation and the preservation of certain genetically determined clinical phenotypes. [9] The genetically determined clinical phenotype is often subjected to environmental modifiers like nutrition and diet, which are coarse, as mentioned in literature by Cassidy, Susanne, Carels, Mossey, Vieira & Chakan. [10-11] As early as 1841, Lefoulon put forward, amongst various etiological factors of malocclusion, the role of body constitutional differences resulting from geographic or socioeconomic status. [12] Numerous studies on twins based on the concept referred to as 'nature vs. nurture have highlighted the influence of environment and dietary influences on the clinical presentation of malocclusion. [13-14] Researchers like Begg, Proffit, Hunter have indicated that malocclusion is often less common in populations that consume a coarse diet. This might be attributed to accommodation brought on by attritional changes to the mesiodistal dimension. Enlow and Solow have suggested the role

of various aspects of mandibular growth as an accommodative phenomenon. [15-16]

The health of a community may be influenced by a multitude of factors such as lifestyle, genetics, environmental factors, and socioeconomic status that might directly influence nutritional aspects. Oral health-related quality of life requires a fully functional dentition as a key parameter to essential oral health. Health-related behavior requires a basic knowledge of maintaining adequate oral health as a prerequisite.

There is insufficient data in the literature on orthodontic awareness among tribal school children in these regions. This study aimed primarily to assess the awareness of children toward orthodontic treatment. Questions were posed to assess their orthodontic awareness, self perceived dental aesthetics, and treatment needs. The main purpose of the screening was to evaluate the malocclusion prevalence and the perceived need for orthodontic treatment among tribal adolescents in Maharashtra. In addition, a correlation was also sought between their coarse diet and the normal pattern of growth and the most prevalent malocclusion

Material and Methods

The sample chosen for this epidemiological survey comprised a total of 400 higher secondary school students aged 13 to 19 years (200 boys and 200 girls) & a total of 300 higher secondary school students aged 13 to 19 years (150 boys and 150 girls) Maharashtra District none of whom had undergone any prior orthodontic treatment. The occlusion of the students was assessed and classified into the categories of ideal occlusion and Angle's Class I, II & III malocclusions. Other parameters noted were overjet, overbite, crowding, spacing, and midline diastema

The school-going children of standards 8th to 12th in the average age range of 13 to 19 years were selected from the schools after obtaining the necessary permission from the tribal authorities and school authorities and the institutional ethical clearance committee. The screening was conducted during school hours. The screening process was possible by utilizing natural daylight and by asking the patients to sit in the portable dental chair. The individuals were examined under natural light but away from direct sunlight. Occlusal characteristics were assessed with the help of ice cream sticks and Moone's probes were used to evaluate various types of malocclusions. A Torchlight was used whenever required.

Before the examination, the children were advised to rinse their oral cavity with chlorhexidine gluconate mouthwash to reduce the number of microorganisms and improve clinical visibility by flushing away any food debris. Then, the clinical examination was performed with all due considerations towards hygiene and infection prevention and control protocol.

Later with the help of pre-sterilized impression trays, alginate impressions were made for children with malocclusion, and casts were poured with dental stone. These casts were analyzed to measure various parameters like overjet, overbite, crowding, spacing, and midline diastema. Crowding and spacing were measured using Carey's/ arch perimeter analysis. The overjet and overbite were calculated using vernier calipers. The examiners were the same throughout the study to avoid inter-examiner errors and to evaluate the various types of malocclusions in these two regions.

Inclusion Criteria:

- ✓ Students by default comprising a random sample of tribal individuals in the region
- ✓ Students in the age group of 13 to 19 years with no history of prior orthodontic treatment
- ✓ Secondary dentition present with no remaining deciduous teeth

- ✓ Presence of intact first permanent molars.

Exclusion Criteria

- ➢ Rampant caries
- ➢ Missing teeth
- ➢ Mutilated malocclusion
- ➢ Craniofacial anomalies
- ➢ Teeth with developmental abnormalities
- ➢ Children with clefts and systemic diseases were also not included

The community mostly influences and thus populations with remote access might very naturally decide against orthodontic treatment for the simple reason of nonavailability in addition to the social conditioning by way of the perceived psychosomatic norm. This study aimed to ascertain the treatment need of adolescents if obstacles of expense and remote access could be overcome and based on the response of the participants, these points could be responsible for tipping the scales towards a much higher treatment acceptance if treatment could be provided within reach and at an affordable price." As in routine marketing, the capture of a market is in a successful initial launch of a product. Similarly, once inroads have been made into such communities, orthodontic treatment can take a firm footing, thus enhancing the oral health-related quality of life and overall human resource on the whole.

The essential objective of this study was to ascertain the basic orthodontic treatment need rationale of a population with sufficient awareness but with no ready access to orthodontic treatments and of a socio-economic status that might require treatment expenses to be sponsored or subsidized. Furthermore, with esthetic perceptions driven by a communal phenotype in these endogamous populations, it was expected to mainly come across borderline derangements of occlusion with a higher percentage of ideal occlusion and Angle's class I Malocclusion. In such a scenario and in the absence of periodontal disease or gross decay, it would require keen interest or a degree of poor self-esteem to solicit orthodontic treatment.

Result

Statistical results of Pearson's chi-square test based on the data obtained from the Division showed no significant relationship between the prevalence of malocclusion and gender in the tribal population. During the examination, certain questions were posed to assess orthodontic awareness, self-perceived dental aesthetics, and perceived treatment needs. While 75% were aware of orthodontic treatment, only 25% had a perceived need for treatment. It may be due to the conduction of regular orthodontic awareness camps in the regions of Maharashtra district by which the tribes over there were aware of orthodontic treatment.

Table 1: Shows the other findings of malocclusion.

Condition	Present %	Absent %
Midline Diastema	5	95
Crowding	15	85
Excessive Overjet	18	82
Excessive Overbite	16	84
Bimaxillary Protrusion	65	35

Table 2: Shows the prevalence of malocclusion

Revenue Division= 300				
Gender	**Males (50%) 150**	**Male**	**Females (50%) 150**	**Female**
Ideal occlusion (5.95%) 50	25	50%	25	50%
Malocclusion (94.04%) 100	65	70%	35	30%
Malocclusion Distribution				
Category	Male	% Of Total Male	Female	% of Total Female
Angle's Class I (72.04%) 100	(50%) 50	30/65 60.16%	(50%) 50	25/35 65.17%
Angle's Class II (25.98%) 35	(55.16%) 25	25/65 22.52%	(30.83%) 15	15/35 19.42%
Angle's Class III (2%) 15	(73.33%) 11	11/65 2.31 %	(26.66%) 4	4/35 1.39%

Discussion

Epidemiological studies related to occlusion and malocclusion help ascertain the etiology of malocclusion. They also play a role in orthodontic treatment planning. Angle, who examined 1000 schoolchildren of St. Louis, Missouri in one of the first recorded studies on the prevalence of malocclusion, observed that 69% had Class I malocclusion, 19% Class II, 3.4% Class III, and asymmetric occlusion was found in 4.6% of the Caucasian's understudy. In his study at Himachal Pradesh, Chauhan D et al.1993 observed severe malocclusion in 3.1% of children. Elective orthodontic treatment was recommended in 8% of the children who showed some form of malocclusion. Mandatory orthodontic treatment was recommended in 1.3% of children who presented with handicapping malocclusion. [17]

In a study done in Jaipur, Rajasthan, the prevalence of malocclusion was 66.7%, with 57.9% presenting with Angle's class I malocclusion, 1.9% of Angle's Class II div 2 & 1.4 % of Angle's Class III. In a similar study, the prevalence of malocclusion was 36.42%, with 29.74% presenting with mild to moderate malocclusion and 6.68% presenting with severe malocclusion.76 In the study performed in Karnataka, the prevalence of Angle's Class I malocclusion was 23.0%, followed by Angle's Class II at 4.5% and Class III at 1.3%. A study in Devangere revealed, 80.1% of school children with little or no malocclusion require no or minimum orthodontic treatment, 15.7% with definite malocclusion require elective treatment, 3.7% with severe malocclusion require prioritized treatment and 0.5% with handicapping malocclusion requiring compulsory orthodontic treatment. [18]

Naga Raja Rao (1980) [19] reported a prevalence of angles Class I 23.0%, Class II 4.5%, Class III 1.3% malocclusion in 511 (at Udupi) subjects ranging from the age 5-15 years. According to other studies from Bangalore conducted on 1001 school children aged 12-15 years, the prevalence of Class I malocclusion was 49.2%, Class II malocclusion was 4.9% and class III was 0.3%. R Muppa et al. 2013 [20] conducted a study in the state of Andhra Pradesh. They observed anterior crowding in 27.37% of subjects, deep bite in 20.5%, Class I in 14.34%, Class II in 9.95%, Class III in 5.33%, anterior spacing in 12.9%, anterior crossbite in 4.98% and open bite in 4.62% subjects.

JN Sharma 2010 [21] according to a study conducted by the prevalence of Class I, II, and III malocclusions was 62.28%, 29.4% and 8.2%, respectively. Out of 350 cases studied for various occlusal traits; absent teeth were 12.6%, supernumerary teeth were 2.9%, ectopic eruptions were 7.1%, midline diastema was 16%, incisor crowding representation of 52.9%, spacing in 30% cases, malformations 3.1%, increased over-jet (>4mm) in 42.3% cases, anterior open bite in 5.1% subjects, deep bite (>4 mm) in 40 % and cleft lip and palate was prevalent in 0.28% subjects in

Aryan and Mongoloid races. Few of these findings are similar to the present study.

According to a study by Mandall et. al. 2001 [22] the authors concluded that ethnicity and social deprivation were not important variables concerning orthodontic aesthetic self-perception. Socially deprived children or those with high aesthetic needs had a more negative perceived aesthetic impact of their malocclusion, but this did not influence their accuracy of perceived treatment needs. Asian females had higher orthodontic treatment needs on dental health grounds than Caucasians and males despite having a lower aesthetic need for treatment.

However, more socially deprived children seem to suffer such disadvantages compared to less deprived children. The perceived aesthetic impact of malocclusion is unlikely to be reliably influenced by the receipt of orthodontic treatment. However, the such perceived aesthetic impact seems important concerning a wish for treatment and, therefore, the potential use of orthodontic services.

The prevailing majority also largely influences the perception of dentofacial esthetics in closed communities. This psychosocial influence on perceiving what is expected has been referred to as the psychosomatic norm by Abdel Kader. It may often play a vital role in case selection or post-treatment patient satisfaction. [23] For example, as most individuals screened had a bimaxillary protrusion, it wouldn't be considered unsightly or abnormal by the community. Diastemas were rare but considered by most tribal adolescents a sign of good luck and prosperity. [24]

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Conclusion

There are two essential conclusions from the data gathered in this study about the orthodontic treatment needs of the populations evaluated. On the one hand, there were a few adolescents with orthodontic awareness on account of knowledge gained from media, schooling, and dental camps who were keen on an orthodontic correction but who expressed a degree of reluctance solely based on factors like duration, number of treatment visits, expense, and remote access to treatment. On the other hand, the majority of adolescents presenting with borderline derangements of occlusion fail to see a need for treatment as the malocclusion isn’t handicapping and no other dental issues exist that might warrant dental attention.

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