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An Assessment Of The Correlation Of Dietary Habits Of 10 Tribal Populations Of The Paderu Revenue Division Of Visakhapatnam District With Their Malocclusion Status And Orthodontic Treatments Needs

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ABSTRACT

The purpose of this study was to evaluate the orthodontic status and perceived orthodontic treatment needs of 2016 tribal adolescents screened in the Paderu Revenue Division of Visakhapatnam District. The sample chosen for this epidemiological survey comprised of a total of 2016 higher secondary schools students aged 13 to 19 years (1157 boys and 859 girls) 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. Results revealed that 32% had normal occlusion. Of the 68% with malocclusion 71% had Angle's Class I malocclusions, 27% had Angle's Class II malocclusions & 2% had Angle's Class III malocclusions. Questions were posed during the examination process to assess orthodontic awareness, self-perceived dental esthetics and perceived treatment needs. While 81% were aware of orthodontic treatment only 16% had a perceived need for treatment. The most prevalent malocclusion amongst the tribal adolescents was Angles's Class I malocclusion with bimaxillary proclination. A chi-square test of independence showed that there was no significant association between gender and the prevalence of malocclusion, $\chi^2 (2, N = 2016) = 5.5, p = .13$.

INTRODUCTION

Tribal populations are usually considered to be a window to the immediate past when compared to their urbanized counterparts. The tribal populations in India are often referred to as Adivasis.¹ Of the four revenue divisions, Paderu Division of Visakhapatnam District (Fig 1.) has 10 subcategories of Adivasis as listed in Table 1.^{2,3} A point of significance to be noted is that individuals belonging to a subcategory only marry within that particular subcategory. In spite of this there were no instances of developmental anomalies or abnormalities in the students screened. The tribals lead a very simple agricultural lifestyle with a diet that is predominantly a coarse diet and display good overall bodily musculo-skeletal growth.⁴ Researchers have shown a correlation between the coarseness of diet and development of the jaws.⁵⁻⁸

Table 1: Tribes of Paderu revenue division, Visakhapatnam district, Andhra Pradesh, India

TRIBES OF PADERU REVENUE DIVISION	
BHAGATHA	KAMMARA
KONDADORA	GADABA
KHOND	KOTIAS
KHONDAKAPU	PORJA
VALMIKI	NOOKADORA

The purpose of the screening was to assess the prevalence of malocclusion and the perceived need for orthodontic treatment, if any, amongst the tribal population. For this it was deemed necessary to first determine what was the most prevalent malocclusion amongst the tribals as this form and shape would be considered normal influencing the perception of esthetics amongst the population with therefore no perceived need for alteration.⁹⁻¹⁴ The presence of normal attrition as influenced by

their diet, coupled with normal musculoskeletal growth due to the active chewing seemed to positively influence the alignment of all teeth with relatively no incidence of

Exclusion Criteria:

1. Rampant caries

Table 2: List of Schools surveyed

School	Location	Date of Screening
Government Tribal Welfare Ashrama High School (GTWAHS)	THALARSING	14/12/2019
Government Tribal Welfare Ashrama High School (GTWAHS)	SRIKRISHNAPURAM	15/12/2019
Government AP Residential Girls School	KANDAMAMIDI	16/12/2019
Government Tribal Welfare Ashrama High School (GTWAHS)	KANDAMAMIDI	07/02/2020
Government Tribal Welfare Ashrama High School (GTWAHS)	LOCHALPUTTU	08/02/2020
Government Tribal Welfare Ashrama High School (GTWAHS)	PEDDALABUDU	09/02/2020

crowding or spacing. There was only an incidence of bimaxillary protusion.

MATERIALS & METHODS

The school going children of standards 8th to 12th in the average age range of 13 to 19 years were selected from the schools listed in Table 2 after obtaining necessary consent and permissions from the tribal authorities and school authorities and the institutional ethical clearance committee. As the screening was conducted during school hours the screening process was possible utilizing natural daylight and was performed with all due considerations towards hygiene and infection prevention and control protocol.

2. Missing teeth
3. Mutilated malocclusion
4. Craniofacial anomalies



Figure 1: The Revenue Divisions of Visakhapatnam District

Inclusion Criteria:

1. Students by default comprising a random sample of tribal individuals in the region
2. Students in the age group of 13 to 19 years with no history of prior orthodontic treatment

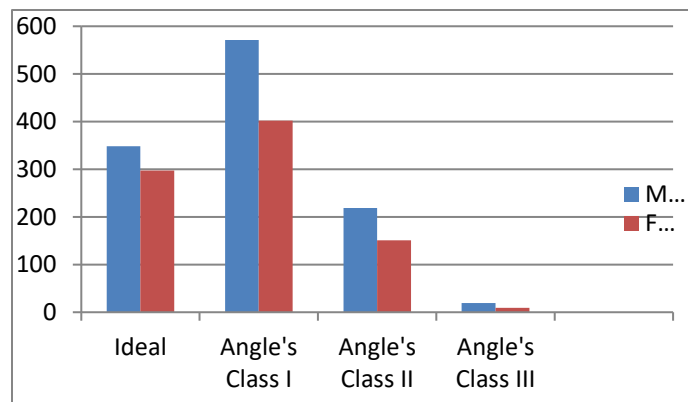


Fig 2. Incidence of malocclusion / The Gender Based Incidence of Malocclusion

The findings were tabulated in Microsoft Excel 2010 and subjected to a gender based percentage distribution (Table 3.4, Fig 2) and a Chi Square statistical analysis . The responses to the questions asked were subjected to a simple percentage calculation(Table 5). The overall prevalence was converted to a piechart. (Fig 3)

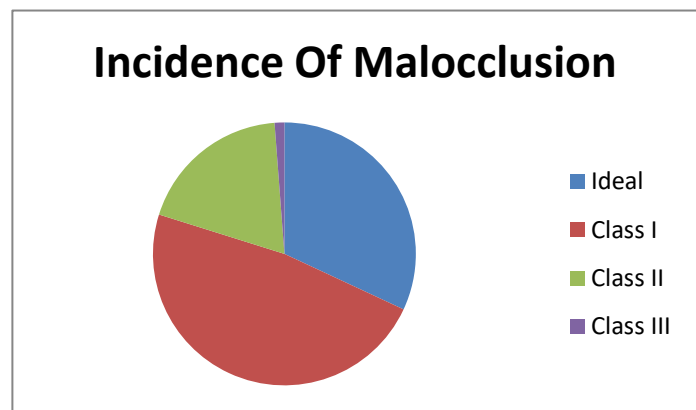


Figure 3: Overall Prevalence of Malocclusion

Table 3: Gender based distribution of malocclusion

PADERU REVENUE DIVISION n=2016				
Gender	MALES (1157)	% Male	FEMALES (859)	% Female
Ideal occlusion (31.99%) 645	348	53.95%	297	46.04%
Malocclusion (68.00%) 1371	809	59.00%	562	40.99%
Distribution of Malocclusion (1371)				
Malocclusion	Male & % Male	% Prevalence Total Male	Female & % Female	% Prevalence Total Female
Angle's Class I (70.97%) 973	571 (58.68%)	571/809 70.58%	402 (41.31%)	402/562 71.53%
Class II (26.98%) 370	219 (59.18%)	219/809 27.07%	151 (40.81%)	151/562 26.86%
Class III (2.04%) 28	19 (67.85)	19/809 2.34%	9 (32.14%)	9/562 1.60%

Results. A chi-square test of independence showed that there was no significant association between gender and the prevalence of malocclusion, $X^2 (2, N = 2016) = 5.5, p = .13$. Questions posed during the examination process to assess orthodontic awareness, self-perceived dental esthetics and perceived treatment need revealed that while 81% were aware of orthodontic treatment only 16% had a perceived need for treatment.

The following conclusions were drawn from the results:

- The tribal adolescents revealed a predominant class I type of malocclusion with no gender bias
- The overall prevalence of malocclusion was 68% with the subgroup percentages as follows: Class I malocclusion as the most prevalent (71%), followed by class II malocclusion (27%), and class III malocclusion (2%).
- The prevalence of excessive overjet and overbite was 15% and 14% respectively
- The prevalence of midline diastema was 8%.
- The prevalence of Bimaxillary Protrusion was 67%
- The prevalence of crowding was 18%

Fig 2. Incidence of malocclusion / The Gender Based Incidence of Malocclusion.

DISCUSSION

The tribal population of Paderu Revenue Division, Visakhapatnam District in the state of Andhra Pradesh displayed very good growth patterns of their jaws. The average individual displayed an athletic built and an overall well-being. Intra oral examination revealed that most individuals had an Angle's Class I type of malocclusion with little need for any form of orthodontic correction. There was

no incidence of crowding or spacing and only a slight prevalence of bimaxillary protrusion.

On further interaction and enquiry with the tribals it was revealed that as part of the traditional culture children solely rely upon their mother's milk until weaned naturally and there was almost no use of feeding bottles nor any subsequent development of detrimental habits. The active lifestyle allows for enough mental and physical exertion to ensure that both young and old alike adopt a pattern of waking early in the morning and of retiring early to bed at night to a sound sleep. The absence of detrimental habits coupled with coarse diet allows for adequate normal functioning of the jaws and musculature to facilitate a normal sequence of exfoliation of deciduous dentition and normal sequence of eruption of the permanent dentition along with a sufficient stimulus for growth.⁵⁻⁸ A diet relatively free of processed food promotes good oral health on one hand but does cause a certain degree of visible attrition on the other.

Most epidemiological studies on tribal populations have focussed on the incidence of malocclusion and the index of treatment needs and the oral health status.¹⁵⁻²² This study aimed at analysing the incidence of malocclusion and evaluating the orthodontic awareness and self-perceived standards of dental esthetics as correlated with a self-perceived need for orthodontic treatment as an indication that esthetic perception is a learned process deeply influenced by cultural variations and the community.⁹⁻¹⁴

Table 4: Other Findings

Condition	Present %	Absent %
Midline Diastema	8	92
Crowding	18	82
Excessive Overjet	15	85
Excessive Overbite	14	86
Bimaxillary Protrusion	67	33

Table 5: Responses to questions posed to analyse self-perceived need for orthodontic treatment.

S.No	Brief Verbal Questions Y/N	Y %	N%
1.	Are you aware of braces to make teeth regular	81	19
2.	Do you feel your smile is attractive	83	17
3.	Would you like to wear clips to make your teeth more regular and attractive	16	84

CONCLUSION

On the path to progress Man often experiments with options that are different from the ones already existing be it a lifestyle or food habits and even just for convenience. Nature on the other hand tries allowing the survival of certain genetic attributes that are best suited to the changing environment. It is interesting to note that if one were to consider the simple and straightforward 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 are a sad consequence of the progress made. As true progress is made by introspection and retrospection it is always possible to retain the best practices and to pass these on to future generations.

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