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Comparative Study of Third Molar Tooth Eruption between Tribal and Non- tribal Groups of Bastar Region, Chhattisgarh

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ABSTRACT

This study was carried out in the Tribal and Non-tribal population in eight villages under Bakavand block of Bastar district of Chhattisgarh with the objective of comparing the pattern of third molar eruption status. A total of 409 individuals aged between 18 to 50 years were examined for third molar eruption. The following instruments like dental probe, mouth mirror, torch light, measuring tape and verniar caliper used for all suspected cases followed by genealogy, interview by structured and pre tested schedule, FGDs, and case study etc. Results revealed that there was higher rate of third molar non-eruption in Non-tribal individuals (6.5%) when compared with the Tribal populations (2.9%). It could be demonstrated that third molar non-eruption increasing is more of a problem of Non-tribal than the Tribal. Civilization and change of diet seemed to be responsible for the observed differences in third molar non-eruption in both the groups in Bastar district of Chhattisgarh. This study also revealed that decreasing eruption of lower third molar and vertical eruption of upper third molar was the commonest respectively in both groups.

Key Words: *Change of diet; Civilization; Non-tribal; Third molar, Tribal.*

INTRODUCTION

Modern humans differ from wild great apes in gestation length, weaning age, inter birth interval, sexual maturity and longevity, but evolutionary anthropologists do not know when these distinctive life history conditions evolved. Scholars have proposed new theoretical frameworks for considering variation in life history traits, as well as the impact of evolution, dietary ecology, immune function and energetic on the expression of the genetical traits (Lee, 1996; Godfrey et al., 2001; McDade, 2003; Leigh & Blomquist, 2007; Kramer et al., 2009; Valeggia & Ellison, 2009. Simultaneously development, reduction and eruption of any body part might be the cause of various diseases and unwanted evolution. The eruption of third molar is one of the major factors on present situation.

In humans, there are numerous examples of tooth patterning abnormalities that occur in the absence of skeletal abnormalities. Thus for example hypodontia (missing teeth) can occur in the absence of any obviously abnormal jaw phenotype, mastication, evolutionary changes of food habit and food quality. The ability of developing teeth to adapt genetic pathways that were in place to regulate jaw morphogenesis may have thus represented an important step in the evolution of heterodonty. Since, humans have developed deciduous and permanent teeth and it is the replacement teeth in humans that are almost always aff ected in hypodontia, whereas the deciduous dentition develops normally. This suggests that there are important aspects of the development of permanent teeth that involve different genetic control to deciduous tooth development or jaw skeleton formation.

Phenotypically the most unstable tooth is third molar in the human dentition and the most subject to variation. Third molar is the last of the permanent teeth to mineralize and erupt. The age for eruption of all four varies from 13 years of age in the most precocious individuals to about 25 years in the most delayed (Hassanali, 1985; Garn et al., 1972). The significant variation which can be observed in most of the people is not the occurrence of third molar, this phenomenon is known as congenital variation. The variation has also been observed among populations, more or less some of contemporary people display agenesis of one or more third molars. The affected group, individuals tend to show signs and symptoms such as agenesis of the mandibular second premolar and/or the remaining teeth of maxillary lateral incisor as well as size reduction. While third molar agenesis is relevant to dentistry (Tavajohi-Kermani et al., 2002), it also has important implications not only for anthropology but also other dental sciences.

The important marker of evolutionary trends is human dentition. The most tenacious of the hard tissues of the body are teeth and can be the only mineralized elements that represent different species of hominids for survive millennia. In addition, due to indicative of selective pressures and genetic affiliations, the dental variation taken place among human populations. Particularly, this kind of variation is significant importance in studies of human variation in dental science and dental anthropology as well paleo-anthropology.

The field of forensic anthropology is of interest among difference populations. In this regard age at death is vital for identifying human remains to determining ancestral origin. Certain dental characteristics can aid in determining ancestry, such as shovel-shaped incisors or Carabelli's cusps (Scott and Turner, 1997; Goldstein, 1948; Brothwell at al., 1963). Similarly, valuable clues to age are provided by the dentition. The third molar, though not

ideal, is sometimes the only indicator of age that can be used when considering young adults (Mincer et al., 1993). The third molar can cause problems when hypodontia is concerned. However, case reports have demonstrated that, in some instances, that age can be misestimated because of reliance on the presence of third molars (Nambiar et al., 1996). Definitely, it may affect identification and determination of the fact.

Impaction of third molars is caused by either insufficient maxillofacial skeletal development or a low correlation between maxillofacial skeletal development and third molar maturation leading to a lack of space between the second molar and the ramus (Obimakinde, 2009). Tooth impaction is presently being diagnosed more often than the past fifteen years. When compared with the primitive races, the modern man seems to have a higher incidence of third molar impaction. Theories on the aetiology of impacted third molars are many and varied but there seems to be a consensus on the association between a modern civilised diet and the occurrence of impactions (Olasoji and Odusanya, 2000).

Third molar teeth are the last to erupt and have a relatively high chance of becoming impacted (Hassan, 2010). Impacted third molar teeth are believed to be mainly due to space deficiency which is attributed to many factors such as soft diet, insufficient eruption forces and hereditary factors. The prevalence rates of mandibular third molar teeth varies from one population to another and several authors have reported prevalence rates ranging from 9.5% to 50%, higher in the western region (Obimakinde, 2009). Studies done in Nigerian population reported a prevalence rate of impacted mandibular third molar teeth as 1.9% to 15.1% for rural and urban populations respectively (Obiechina, et al., 2001). A study done in Kenya reported a prevalence rate of impacted mandibular third molar teeth as 15.8/1000 (1.6%) (Mwaniki and Guthua, 1992).

In addition, to ethnographic studies of traditional human societies and comparative studies of Tribal and Non-Tribal population, teeth yield the primary evidence for testing evolutionary theories, life style, genetical factors and its associate problems.

Objectives

The objective of the present study is to deals with cusp patterns, tooth shapes, status of third molar and their arrangement in a dental pattern for analysis of the development and eruption of third molar.

MATERIAL AND METHOD

This cross-sectional study was conducted in the Tribal and Non-tribal population in eight villages under Bakavand block of Bastar district of Chhattisgarh with the objective of

comparing the pattern of third molar eruption. All information was collected from two difference sources like as primary and secondary source. Primary data were collected in the field by survey, Observation, Personal Interview, Questionnaires, schedules, mechanical devices like cameras, projective techniques- dental probe, mouth mirror, torch light, measuring tape and verniar caliper and group discussions methods that are used. On the other hand, secondary data has been collected from Private and Govt. Dental Hospitals, published research paper, journals, books and internet.

In the sampling frame 409 individuals were comprised in which 201 individuals were from Tribal with special reference to Bhatra communities and rest 208 included from Non-tribal (SC, OBC and General) communities. Out of total 201 belong to Tribal in which 78 males and 123 are females. Similarly in case of Non-tribal, total respondents were 208 individuals. In this case majority 110 were males and 98 females which were covered for the present study.

More than 35 percent of the population belongs to 23-32 years for both males and females and little more than 16 percent populations i.e younger which came in 18-22 years of age group. Around 15 percent population come between 33-37 years and about 13 percent of the sample representatives were between the age group of 38-42 years age group. Only about 7 percent peoples were 48-50 years old in surveyed populations. Though estimation of age is very difficult among Tribals as well as Non-tribals due to lack of authentic records but age has been recorded with the help of events.

The selection of the study areas was depending on stratified sampling while the selections of the objects were chosen by purposive sampling. All data was processed in MS-Excel data sheet and analyzed by using SPSS software package of keeping in view the specific objective of the study.

RESULTS

Prevalence of Eruption Status of Third Molars

Normally eruption of third molars occurs between the age of 18 and 24 years. The prevalence rate of non-erupted third molars widely varies and it is influenced by age, sex and ethnic origin. The failure of third molar eruption is a quite common condition and the extraction of impacted third molar teeth is carried out as routine surgical procedure in dental surgion. Here the present study was aimed to determine the number of third molars per person with their eruption status.

The frequencies of third molar agenesis for sex divisions of the sample under study are given in table 1. The frequencies of agenesis for the Tribal sample are lower than those for the Non-tribal sample. The results are broken down for each group below.

Distribution of Absent of Third Molars

Tribal Male and Female

The total Tribal males consisted of 78 individuals between the ages of 18 and 50 years. There was no predilection for side, as the right and left sides of the dentition each had 5 third molars missing. Four of the individuals were missing only one third molar, each a different one. One individual was missing both maxillary third molars, and one showed agenesis of all four third molars. Interestingly, 2 of the Tribal males had supernumerary molars. One boy, aged 16, had an extra molar behind the left maxillary third molar, while the other, aged 15, had a fourth molar behind the right mandibular third molar. No teeth were congenitally absent in these 2 individuals.

Among females age ranged from 18 to 50 years. There were 7 third molars missing from the right side of the dentition, and 6 from the left. 3 individuals were missing only one third molar, each a different one. 2 of the females were missing 2 third molars, and 2 individuals were missing 3 third molars. One of the girls missing 3 third molars was also missing both mandibular second premolars. None of the Tribal females displayed agenesis of all 4 third molars. In contrast, one of the Tribal females had 4 supernumerary molars, giving her a total of 36 teeth. No other case of supernumerary teeth occurred in the Tribal female sample. However, 2 other individuals had congenitally absent teeth. One girl was missing both mandibular first molars, while the other lacked only the left mandibular first molar. Both of these patients had all of their third molars.

Non-tribal Male and Female

A total of 110 Non-tribal males were in the sample, ranging in age from 18 to 50 years. There was no significant difference between sides, with 19 missing from the right and 18 from the left. Six males were missing only one third molar, with none missing the left mandibular third molar. Eight were missing 2 third molars. Of these, one boy had extensive hypodontia. Besides the two mandibular third molars, he was also missing his four maxillary premolars, his mandibular second premolars, and his right maxillary lateral incisor. Only 1 individual was missing 3 third molars. Three Non-tribal males showed agenesis of all four third molars. Of these, one was markedly behind in terms of dental development, and had still not exfoliated his deciduous second molars at age 15. At age 20 his second permanent molars

were erupting. There was no supernumerary tooth noted in any person in the sample of Non-tribal male.

The Non-tribal female sample consisted of 98 individuals between the ages of 18 and 50 years of age. 10 third molars were missing from the right side of the dentition compared to 8 from the left side. 9 of the girls were missing only one third molar, with a majority of 7 third molars missing from the mandible. One girl who was missing her left maxillary third molar was also congenitally missing her right maxillary second premolar. 3 girls were missing two third molars. One of these had a complete unilateral cleft of the lip and palate and also lacked her mandibular second premolars and her maxillary right lateral incisor. One girl was missing 3 third molars, and none was congenitally missing all 4 third molars. One of the females had an absent left second mandibular molar, but had all 4 third molars. None of the Non-tribal females had supernumerary teeth.

Table 1: Community-wise Distribution of Absent of Third Molars among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Variables	**Tribal**				**Non-Tribal**			
	Male (n=78)		**Female (n=123)**		**Male (n=110)**		**Female (n=98)**	
	Maxilla (n=156)	***Mandible (n=156)***	***Maxilla (n=246)***	***Mandible (n=246)***	***Maxilla (n=220)***	***Mandible (n=220)***	***Maxilla (n=196)***	***Mandible (n=196)***
Number of Absent Teeth	6	4	8	5	18	19	6	12
Total Tooth (%)	3.85	2.56	3.25	2.03	8.18	8.63	3.06	6.12
	3.21		2.64		8.41		4.59	
	2.92				6.50			
No.of Individuals	6		7		18		13	
Individual Frequency (%)	7.69		5.69		16.36		13.26	
	6.69				14.81			

Altogether Total Number of Missing Third Molars

The four groups in the sample show significantly different results, considered separately. When placed together, however, several patterns become apparent. Most interesting is that in each case where only 2 third molars were missing, these molars were from either the maxilla or the mandible. They never segregated by side. There were an equal number of these cases for both the mandible and maxilla at 7 each. Likewise, a nearly equal number of each third molar was missing for the entire sample (table 2).

Table 2: Community-wise Total Number of Missing Third Molars among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Community	**Sex**	**Third Molar**				**Total**
		Maxilla		**Mandible**		
		Right	***Left***	***Right***	***Left***	
Tribal	*Male*	3	3	2	2	**10**
	Female	4	4	3	2	**13**
Non-tribal	*Male*	9	9	10	9	**37**
	Female	3	3	7	5	**18**
Total		**19**	**19**	**22**	**18**	**78**

Number of Third Molars Missing Per Individual

Table 3 reveals that a total of 44 individuals displayed third molar agenesis to some extent, a frequency of 10.2% for the entire sample. Most of the affected individuals had either 1 or 2 third molars congenitally missing, while much fewer had either 3 or all of the third molars absent.

Table 3: Community Wise Number of Third Molars Missing Per Individual among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Community	**Sex**	**Number of Third Molars Missing**				**Total**
		1	***2***	***3***	***4***	
Tribal	*Male*	4	1	0	1	**6**
	Female	3	2	2	0	**7**
Non-tribal	*Male*	6	8	1	3	**18**
	Female	9	3	1	0	**13**
Total		**22**	**14**	**4**	**4**	**44**

Odds Ratio by Sex in All Third Molars

From the table 4, when subjected to statistical analysis, the data revealed a number of associations. There was a significant association between ancestry and congenital absence of a third molar, with Fisher's exact test producing a value of $p<0.001$. Interestingly, the results were divided when sex was introduced along with ancestry in the odds ratio analysis.

In this case males the p-value was 0.00051 while for the females it was 0.1220. So there was highly significant in male in all third molars as p-value is 0.00051. But females it is insignificant as p-value is 0.1220.

Table 4: Odds Ratio by Sex in All Third Molars among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Variables	**Limit**	**Sex**	
		Male	**Female**
		Odds Ratio for (Tribal / Non-tribal)	***Odds Ratio for (Tribal / Non-tribal)***
Value		2.77	1.7733
95% Confidence Interval	*Lower*	1.36	0.8579
	Upper	5.66	3.6655
P-Value		0.00051	0.1220

Odds Ratio by Sex in Maxilla

Table 5 shows that for males the p-value was 0.0976, while for females it was 0.9094. There was no significant difference for the maxilla, with p=0.0976 for the males and 0.9094 for the females.

Table 5: Odds Ratio by Sex in Maxilla among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Variables	**Limit**	**Sex**	
		Male	**Female**
		Odds Ratio for (Tribal / Non-tribal)	***Odds Ratio for (Tribal / Non-tribal)***
Value		2.23	0.9395
95% Confidence Interval	*Lower*	0.86	0.3205
	Upper	5.75	2.7542
P-Value		0.0976	0.9094

Odds Ratio by Sex – Mandible

Ancestry was also important when considering each dental arcade. Both Non-tribal males and females were significantly more likely to have third molars absent in the mandible than their Tribal counterparts. While there was a statistically significant difference between the Tribal males and the Non-tribal males (p=0.0225), there was no difference by ancestry between the females (p=0.0343) (table 6).

Table 6: Odds Ratio by Sex – Mandible among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Variables	**Limit**	**Sex**	
		Male	**Female**
		Odds Ratio for (Tribal /	***Odds Ratio for (Tribal /***

		Non-tribal)	*Non-tribal)*
Value		3.59	3.1435
95% Confidence Interval	*Lower*	1.2	1.0882
	Upper	10.78	9.0804
P-Value		0.0225	0.0343

When each sex was considered, there was no statistically significant association for the total number of absent teeth, mandible nor maxilla. This held true both for the Tribal sample and the Non-tribal sample. There was no significant predilection foreside either by sex or ancestry.

Size of Jaw

Table 7 shows the size of Jaw among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District. It has been found that out of total 409 individuals, 42.54 percent individuals jaw sizw 10-10.9 Cm followed by 35.45 percent are 9-9.9 Cm. Where as only 2 individuals are 14-14.9 Cm. The similar trend it also observed among Tribal and Non-tribal individuals. But here is to be mentioned that the size of Jaw or mandible are quite large in size in comparison to Non-tribal groups.

Table 7: Size of Jaw among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Size of Jaw (Cm)	**Tribal**		**Non-Tribal**		**Total**	
	Number	***%***	***Number***	***%***	***Number***	***%***
8- 8.9	5	2.49	16	7.69	21	5.13
9- 9.9	70	34.83	75	36.06	145	35.45
10- 10.9	86	42.79	88	42.31	174	42.54
11- 11.9	18	8.96	14	6.73	32	7.82
12- 12.9	13	6.47	11	5.29	24	5.87
13- 13.9	7	3.48	4	1.92	11	2.69
14- 14.9	2	1.00	0	0.00	2	0.49
Total	**201**	**100.00**	**208**	**100.00**	**409**	**100.00**

Size of Ramous

Table 8 reveals that out of total 409 sample of both Tribal and Non-tribal groups in Bastar district of Chhattisgarh, 88.51 percent individuals ramus size 6- 8.9 Cm followed by 8.31 percent individuals have 5-5.9 Cm and rest 3.18 percent individuals have 9-10.9 Cm. The similar trend has been observed both the Tribal and Non-tribal groups, where difference only shorter size of ramus has been found among Non-tribal groups.

Table 8: Size of Ramous among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Ramous Size (Cm)	Tribal		Non-Tribal		Non-Tribal	
	Number	***%***	***Number***	***%***	***Number***	***%***
5- 5.9	15	7.46	19	9.13	34	8.31
6- 6.9	70	34.83	78	37.50	148	36.19
7- 7.9	54	26.87	57	27.40	111	27.14
8- 8.9	54	26.87	49	23.56	103	25.18
9- 9.9	5	2.49	4	1.92	9	2.20
10- 10.9	3	1.49	1	0.48	4	0.98
Total	**201**	**100.00**	**208**	**100.00**	**409**	**100.00**

Skeleton Abnormalities

This study was designed to investigate the characteristic skeletal and dental features of among the Tribal and Non-tribal individuals (table 9). Specific patterns of third molar absence emerged. The cephalometric parameters of the individuals with severe absence differed from the classic norms in bimaxillary retrognathism, chin angle, and maxillary incisor inclination. These individuals in almost all parameters examined. The Tribal and Non-tribal individuals absence of third molar teeth have due to skeletal patterns or abnormility. In this regard, It has been observed that out of total 409 individuals only 4 individuals have skeletal abnormality in which one are from belong to Tribal and 3 persons belong to Non-tribal community.

Table 9: Observation of Skeletal Abnormalities among Tribal and Non- Tribal in Eight Villages of Bakavand Block of Bastar District

Observation	Tribal		Non-Tribal		Non-Tribal	
	Number	***%***	***Number***	***%***	***Number***	***%***
Present	1	0.50	3	1.44	4	0.98
Absent	200	99.50	205	98.56	405	99.02
Total	**201**	**100.00**	**208**	**100.00**	**409**	**100.00**

Number of Cusp in Third Molar

Table 10 reveals that out of total 409 sample of both Tribal and Non-tribal groups in Bastar district of Chhattisgarh, 86.55 percent individuals Cusp 3- 5 in numbers followed by 9.54 percent individuals have no cusp and rest 3.91 percent individuals have 6 in numbers. The similar trend has been observed both the Tribal and Non-tribal groups.

Table 10: Number of Cusp in Third Molar among Tribal and Non-tribal in Eight Villages of Bakavand Block of Bastar District

Cusp (in Number)	Tribal		Non-Tribal		Total	
	Number	***%***	***Number***	***%***	***Number***	***%***
No Cusp	23	11.44	16	7.69	39	9.54
3 Cusp	2	1.00	5	2.40	7	1.71
4 Cusp	111	55.22	115	55.29	226	55.26
5 Cusp	58	28.86	63	30.29	121	29.58
6 Cusp	7	3.48	9	4.33	16	3.91
Total	**201**	**100.00**	**208**	**100.00**	**409**	**100.00**

DISCUSSION

These results are comparable with those of others. The combined frequency of 14.81% third molar agenesis in the Non-Tribal sample is close to Garn's (1963) study. Both of these fall within the lower range of frequencies reported for Non-tribal samples. However, while Garn found that females had a greater frequency of third molar agenesis, the reverse is found in the present study. In fact, none of the previous studies cited found a higher frequency of third molar agenesis in the males. In this study the difference was not statistically significant. It could be that the relatively small sample size of 208 exaggerated the difference between the males and females. In a larger sample the results might be different.

The frequencies of third molar agenesis found in the Tribal sample are similar to those found in study samples (Chagula, 1960). The frequency for the Tribal males, using the total tooth count method, was 3.21%, which is only slightly higher than study sample (Chagula, 1960). However, the individual count method yielded a frequency of 6.69%, which is almost twice as high as the frequency reported by Brothwell and Coworkers (1963) study sample. However, the present results are only about half as high as the frequency of third molar agenesis found by Hellman (1928) in his study.

It is to be noted here that admixture may be important. The extended family histories of the blacks included in the present study are unknown. No genetic study was conducted on sample. Moreover, it is not yet known how the genes possibly responsible for third molar agenesis, Msx1 and Pax9 (Vieira, 2003), might segregate in admixed populations. Therefore, no conclusions about the effects of admixture in this study can be reached. It can only be suggested that the individual count frequency of third molar agenesis for the present study is higher than that due to moderate admixture with Non-tribals. Hellman's (1928) results may indicate a higher level of admixture in the region from which his sample was taken. Studies of the influence of genetic admixture on frequencies of third molar agenesis in Tribals must be conducted before firmer conclusions can be made.

In comparing the Tribal and Non-tribal samples, one of the significant differences was in the frequency of third molar agenesis in each dental arcade. There was a greater frequency of congenital absence of the third molar in the mandible for the Non-tribal sample. This is consistent with most other studies (Goldstein, 1948; Nanda, 1954; Garn et al., 1963; Haaviko, 1971). The insignificant difference between the frequencies of third molar agenesis in the dental arches in the Tribal sample is comparable to the results of Lavelle and Moore's (1973) study. They also found that there was a similar frequency for each arch. However, since the overall results of Lavelle and Moore's (1973) study are unusual, it is unclear whether their estimations of frequency of third molar agenesis in the arches are representative. The present study did find that there was a slightly higher predilection for congenital absence of the third molars in the maxillae of the Tribal sample, but this difference was not significant. Likewise, the insignificant difference in frequencies of third molar agenesis for each side of the dentition in both Tribals and Non-tribals is supported by other studies (Garn et al., 1963; Bermudez de Castro, 1989).

Though the general findings for the samples in the present study are indicative of the variation in the frequency of third molar agenesis, some of the individual cases are also telling. One example is that of the Non-tribal female with a cleft lip and palate. Among her congenitally missing teeth were her right maxillary lateral incisor and mandibular second premolars. This hypodontia is consistent with other studies of facial clefting. While hypodontia is greatest in the area of the cleft, the tendency for teeth of all classes to be congenitally absent is generally higher (Harris, 2002). Perhaps this is why her mandibular third molars, which are far from the area of clefting, were also congenitally absent in this case. This possibility is supported by the studies of Vieira (2003), who found that oral clefts

and associated dental agenesis, including third molar agenesis, are both linked to a mutation on the Msx1 gene.

The familial inheritance may also be demonstrated in the case of the Non-tribal male with extensive hypodontia. It was noted in his dental record that both his father and grandfather had also exhibited significant hypodontia. This individual was missing all 4 of his maxillary premolars and both of his second mandibular premolars, in addition to his mandibular third molars. The lack of second premolars and third molars is cited as one of the signs of Msx1 mutation (Vastardis et al., 1996). Of course, since genetic tests were not carried out on this boy or his kin, it cannot be established whether an Msx1 mutation played a part in his family's hypodontia.

The genetic component of third molar agenesis is apparent. However, in the case of the Non-tribal male with delayed eruption, the developmental hypothesis for third molar agenesis is also supported. The dental records noted that this boy had retained his deciduous molars through age 15, and at age 20 still did not have completely erupted permanent second molars. All 4 of his third molars were congenitally absent. Tavajohi-Kermani and colleagues (2002) noted that dental agenesis is associated with delayed tooth formation, retention of deciduous teeth and prolonged exfoliation of the deciduous teeth. This supports Garn and Coworkers' (1963) theory that there is a critical point for the development of teeth: if a tooth has not formed by a certain point in the individual's dental development, it will not form at all. The third molar is the last tooth to develop and it may be susceptible to agenesis during a delay in dental development. Developmental delay may have been a causal factor in the congenital absence of third molars in this case.

These several cases are illustrative of some of the explanations for third molar agenesis that have been offered by a variety of scholars. In the majority of the cases of third molar agenesis in this study, however, it was not clear why agenesis occurred or did not occur. While measurements were not taken, in the majority of the affected cases it seemed that there was sufficient room in the dental arch for third molars to develop. Therefore, in this case as in others, the idea that agenesis is due to constricted room in the dental arch seems unsupportable. Beyond this, conclusions about the etiology of third molar agenesis in this sample cannot be reached. Since third molar agenesis is not uncommon, its occurrence was usually not recorded in the clinical notes associated with each individual in the sample. The dentitions in most of the affected cases seemed normal on the panoramic radiographs, except for the absent third molars. More studies on the genetics of third molar agenesis and its

frequency in temporally and geographically varied human populations should be conducted to learn more about the causes of this trait.

This tendency of more impaction in the mandible is also expressed by the results of Gunter (1942), Stones (1962), Nanda and Chawla (1959) etc. Few possess rudimentary third molars. Moreover there is a considerable correlation between missing, impacted and rudimentary third molars. No fourth molar was found. Absence of second molar was observed in only one case with an enlarged adjacent first molar and missing third molar. This finding is important when reduction of dentition is considered from evolutionary aspect. All these findings may lead one to consider our third molars as 'vestigial' structures. Darwin (1881), Hellman and Gregory (1926) came to the conclusion that third molars are decadent teeth which will eventually be lost from human dentition. However, there are others who observed from different angles. As for instance, Goblirsch (1930) finding low percentage of missing teeth in his study maintained that the third molar was not a decadent tooth, and it would not disappear but would remain probably in a rudimentary condition. Nanda in his study mentions that differences in the incidence of absent third molars are associated with underlying genetic differences which make the individuals differ morphologically from each other. After adequately considering the options of above mentioned authors, the present study supports the claim of Nanda and Chawla (1959) but still favors the speculation that third molars are decadent vestigial teeth. Why then should these teeth become vestigial? This is another controversy as great as the previous one. Most advocate the lack of space as the main factor leading to this vestigial condition. Thoma and Goldman (1963), Salzmann (1957), Archer and Nodine (1961) all believe that refinement of food led to lack of exercise to the jaws and teeth with resultant reduction in size. This disuse might have led to their agenesis. During the eruption, the calcified crowns of mandibular third molar are directed upwards and medially (mesially) and hence if rotation for final position fails to occur, they get impacted. An additional fact is lower third molar is larger than upper. Hence mandibular impactions are more frequent than maxillary. Again mesioangular type must be more common than others in mandibular teeth. The present study confirms all these facts. Maxilla dominated in agenesis and rudimentary teeth but the mandible presented more impaction as expected. Thus in addition to the direct relation between agenesis, impaction and rudimentary condition of third molar, there also exists indirect relation which is irregular in size, site and type.

RECOMMENDATION

Third molar eruption and non eruption is an observable result of a complex interplay of affecting individuals on the biological and epigenetic levels. There is a few vital recommends to improve health indicators amongst Tribals and Non-tribal to control the third molar eruption and non-eruption rate. Logic model of third molar non-eruption prevention programme is a useful tool to reach the goal in the community level prevention. Third Molar Non-eruption prevention and management now a day a big challenging issues in the world.

CONCLUSION

Teeth are the most mineralized and hardest structure in the human body. The study of their origin and the variations is called dental anthropology. This area of study is useful in archaeology, paleontology, physical anthropology and forensic pathology/ dentistry. Its application is also important in clinical dentistry as deep pits and grooves between cusps become the focus for the initiation and progression of caries. In summary of racial characteristics of human teeth, the final tooth form observed in a person's jaw represents the sum total of the effects of inherited genetic control; the developmental process including interaction between neighbouring teeth; and also the prenatal and postnatal environmental influences. Variations can therefore occur during initiation of tooth germs, their growth, organic matrix apposition and subsequent mineralization (Loh, 1980).

Heredity certainly plays a large part in the development of dental characteristics of an individual. Determining the racial affinity from teeth is certainly not an easy matter, but it is often the most useful step in the identification process of an unknown body. Some of these characteristics are judged subjectively while others may have to be expressed in terms of measurements and indices. Caution must be exercised, however, in concluding the racial identity of an individual from teeth as a specific skull may lack certain traits or may exhibit contradictory ones. Furthermore, hybridization between races in a cosmopolitan population has caused much blending or breakdown of these traits causing racial determination from dental characteristics increasingly arduous.

Overall from the discussion regarding the evaluation of human jaws and the teeth it has been concluded that the evolution of human masticatory complex is strongly related to diet, the use of tools and fire, and finally speech, and has a more important part in the evolution of mankind than the dentists know.

In review of third molar teeth, it has been found that the influence of the third molars on the alignment of the anterior dentition is still controversial. There is no conclusive

evidence to indicate the third molars as being the major etiologic factor in the post treatment changes in incisor alignment.

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