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ASSESSMENT OF AGE BY THIRD MOLAR ERUPTION AMONG FEMALES IN SOUTH TAMILNADU

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ABSTRACT: BACKGROUND: The judicial system requires the estimation of age by forensic medicine experts in most instances. The eruption of third molar for age assessment may help to know whether an individual is a juvenile or an adult. **AIM:** In this study, estimation of the age of females by eruption of the third molar was attempted. **MATERIALS AND METHODS:** 207 female students between the age group of 15 and 27 years were selected for this study based on the availability of their birth certificates. Their oral cavity was examined for eruption of the third molar. **RESULTS:** It was observed that the estimated age of eruption of third molar among the females was 23 years. **CONCLUSION:** The age estimation is more useful for Forensic experts to face the queries which are usually raised by legal proceedings.
KEYWORDS: Third molar eruption, Age assessment.

INTRODUCTION: Estimation of the age of an individual is usually done by studying the following: 1. Physical development, 2. Teeth, 3. Appearance and fusion of ossification centres, 4. Age related changes.[1] Out of all these, teeth are the best parameters because the age of eruption of the teeth is pretty constant in most individuals and remains in the narrow range.[2] In addition, the dental age predictors are minimally influenced by the nutritional, environmental, medical and living conditions.[3] Various methods are utilized for determination of age from dentition. They may be described under four categories namely, clinical, radiographic, histological, physical and chemical analysis.[4] Of these, the clinical examination of visualizing the tooth eruption in the oral cavity is more suitable method since it does not require any special equipment, expert opinion; noninvasive and more economical.[5] After 14 years, age estimation by the third molar eruption is the method of choice.[6] Eruption of the third molar usually occurs between the age group of 17 and 25 years.[7] And this eruption in females may be one year before that of males.[8] It is presumed that, the reason for the wide range of age for eruption of the third molar is the earlier appearance of the tooth in females. To minimize the range, it is realized that an individual age assessment should be done for both sexes separately. In this present study such attempt was made to assess the age of females by third molar eruption and also the preference of the quadrant in which the third molar tooth erupts first was verified.

MATERIALS AND METHODS: A total of 207 female subjects from the ages 15 – 27 years were included based on the availability of their birth certificates and their oral consent. The female subjects from students of Tirunelveli Medical College, Diploma in Medical Laboratory Technology students in Tirunelveli Medical College Hospital and students of Gandhimathy Higher Secondary School in Tirunelveli were taken for study, during the period of August and September 2013 after due approval from the Institutional Ethics Committee of Tirunelveli Medical College and Hospital. The subjects were asked to open the mouth. The teeth were examined either in good light or using torch. The third molar tooth eruption was confirmed if it had pierced the gum and visible in the oral cavity.

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STATISTICAL ANALYSIS: The data were analyzed by the statistical software namely SPSS IBM statistics 20. The p values less than 0.05 were considered as statistically significant (P<0.05)

RESULTS: The mean and median ages of the study subjects were 20.5±3.3 years and 20 years respectively with range of 15-27 years. The mean ages of eruption and non-eruption of third molar were 21.8±3.0 and 18.5±2.8 years respectively. The difference between the mean ages of eruption and non-eruption were statistically very highly significant (P,0.001).

Estimation of Age at Eruption:

Age	Erupted		Not erupted		Total		Significance
	No.	**Proportion**	**No.**	**Proportion**	**No.**	**Proportion**	
15	0	0.0	12	14.8	12	5.8	P<0.05
16	4	3.2	11	13.6	15	7.2	P<0.05
17	4	3.2	15	18.5	19	9.2	P<0.05
18	11	8.7	7	8.6	16	8.7	P>0.05
19	14	11.1	6	7.4	20	9.7	P>0.05
20	12	9.5	12	14.8	24	11.6	P>0.05
21	16	12.7	4	4.9	20	9.7	P>0.05
22	17	13.5	9	11.1	26	12.6	P>0.05
23	13	10.3	1	1.2	14	6.8	P<0.05
24	9	7.1	0	0.0	9	4.3	P<0.05
25	5	4.0	2	2.5	7	3.4	P>0.05
26	10	7.9	1	1.2	11	5.3	P<0.05
27	11	8.7	1	1.2	12	5.8	P<0.05
Total	**126**	**100.0**	**81**	**100**	**207**	**100**	
Table 1: Estimation of age at eruption of third molar among the females							

The above table -1 estimates the age at which the wisdom tooth of a girl was erupted. In the ages of 15, 16 and 17 the non-eruption of teeth was statistically significantly more than that of the eruption of Third molar tooth (P<0.05). But the eruption and non-eruption in the ages of 18,19,20,21 and 22 were not statistically differed significantly (P>0.05). At the age of 23 and onwards except the age 25 the eruptions of third molar tooth was statistically significant (P<0.05).

Association between Age and Eruption of Third Molar Tooth: The median age of the study subjects was 20 years. They were classified into two groups according to the median and tabulated as follows.

Age Group	Eruption		Total	χ^2 (df)	Significance	Odds Ratio	Confidence Interval @ 95%	
	Yes	**No**					**Lower**	**Upper**
≥20	93	30	123	26.146 (1)	P<,0.001	4.791	2.627	8.737
< 20	33	51	84					
Total	126	81	207					
Table 2: Association between age and eruption								

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The above table -2 shows the association between age and eruption of IIIrd molar eruption. The eruption of third molar tooth is strongly associated with ≥ 20 years (P<0.001) The odds ratio explains the eruption of third molar tooth in the ages of ≥20 years was nearly 4.8 times greater than the <20 years and the same will be in the population in between 2.6 to 8.7 times @ 95% C I.

DISCUSSION: Estimation of age by assessing the development of teeth has been used over a long period of time. This can be an accurate measure since it is independent of external influences like malnutrition or infections. This has a drawback especially during adolescence when the third molar is the only left out variable indicator. Also a great difference in morphology, position and time of formation can occur. Other important drawbacks can be difference among populations, methodology and observers.

Inspire of the drawbacks the reason to reply on this third molar eruption to estimate age is because they are only very few alternative methods during mid-teens and early 20's for age estimation. In the present study, a significant difference was observed in age of third molar eruption. The mean age of eruption was found to be 21.8±3.0. The difference between the mean ages of eruption and non-eruption were statistically highly significant (P, 0.001). Also eruption of third molar is strongly associated with the age of ≥20 years (P < 0.001), with the odds ratio it was also found that eruption of 3rd molar at ≥20 years was 4.8 times greater when compared to 3rd molar eruption at ≤20 years. These findings were similar to the previous study by H.Mincer et al.[9] But in another study by Jashwant A Dorji there was no significant difference in age at various developmental stages in left and right third molar in both arches.[10]

SUMMARY AND CONCLUSION: The present study was aimed at the assessment of age by examining the eruption of third molar tooth among females between 15-27 years in a hospital in South Tamilnadu.

Medico legal questions on many instances involve whether the individual is a juvenile or an adult i.e. younger or older than 18 years. Since 3rd Molar eruption mainly happens in the age range of 21.8+ 3.0. Hence assessment of 3rd molar eruption can be used as an important tool in chronological age estimation. In overview the development of third molar can be the only quantitative variable for estimating the age of a person in her late teens or early 20's and this can be used in the absence of other better parameters for age estimation.

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