DETERMINE THE AGE ESTIMATION FROM SECOND MOLAR BY MODIFIED GLEISER AND HUNT METHOD

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Abstract

Background: Dental age estimation may require its application on dead and the living. Forensic cases at medical examiner/coroner offices or clustering the victims in mass disasters are the most common scenarios, where dental age estimation is applied on the dead ; criminal and immigration cases are the ones where dental age estimation offers a scientific, inexpensive and reasonably fast means of age assessment.

Objective: To determine the age estimation from second molar by modified gleiser and hunt method

Materials and Method: The study sample consisted of 100 OPG's (50 males and 50 females) of age ranging from 10 to 20 years with known date. The present study was conducted in the department of forensic odontology. The samples were collected from the department of oral medicine and radiology ,Saveetha dental college and hospital by using Planmeca software. The collected data was transferred to SPSS software for the result.

Result: Using SPSS, The Standard deviation for Male 37 staging is ± 2.62 years. And, the Standard deviation for Female 37 staging is ± 2.58 years. The combination of Male and female tooth number 37 staging is revealing the good results with the standard deviation of ± 2.55 years

Conclusion: Gleiser and Hunt developed a far more reliable technique of determining the dental and chronological age of a child and adolescent aged 10 to 20 years using a radiological method of permanent mandibular second molars.

Keywords: Gleiser and Hunt, mandibular second molars, age estimation

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1.   Introduction

Forensic age estimation of unidentified corpses and skeletons for the purpose of identification has been a traditional feature of forensic science[1]. Successfully determining the identity of a decedent is of considerable significance from the ethical, legal and criminal perspective[2].It is not only the prerequisite for officially declaring an individual dead, but it is also the basis for investigating crimes, mass disasters or war crimes [3]. The most accurate and widely used way of estimating age is bone age, and the bones of the hand and wrist are frequently employed in this manner[4]. Dentists, on the other side, have turned to calculating dental age because assessing bone age is complicated and time-consuming, and patients must pay more and undergo larger doses of radiation.

The dental age assessments of living individuals are frequently asked to assist legal authorities in making decisions regarding the age of unaccompanied minor asylum applicants[5]. Teeth could be better preserved than all other tissues, including bone, have degraded, however unlike bone, they can be examined directly in living people and so provide a more accurate estimate of age[6]. Developing teeth are used in a variety of disciplines to assess maturity and estimate age, although the accuracy of diverse methods has not been thoroughly explored[7]. It can be used to determine the identity of living or deceased people. Malnutrition and hormonal imbalances have less of an impact on dental development than they do on skeletal growth[8].

Although tooth development is a useful indication for predicting children's ages, its accuracy declines in adolescents and adults whose dental development is essentially complete[7]. To characterise the dental maturation process, several staging systems have been established. Among that Gleiser and Hunt found that the various phases of odontogenesis, which can be analysed on radiographic examinations based on the progressive calcification of the hard tissues of the tooth, were more relevant than the eruptive sequence in determining the age of the patient under considerationThe examination of dental radiographs can be used to simply and non-

invasively stage second molar crown and root mineralization[9].Our team has extensive knowledge and research experience that has translate into high quality publications [10–19].

The aim of this study to determine the age estimation from second molar by modified gleiser and hunt method

2.   Materials and Method

The study sample consisted of 100 OPG's (50 males and 50 females) of age ranging from 10 to 20 years with known date. The present study was conducted in the department of forensic odontology. The samples were collected from the department of oral medicine and radiology, Saveetha dental college and hospital by using Planmeca software. The collected data was transferred to SPSS software for the result.

Assessment of Dental Age Using Gleiser and Hunt Method:
In this method, age estimation is using the developing second molar. The second molar's development was categorised into different stages. Each stage was estimated and translated into a developmental score. This present study Staging was modified and given according to the Gleiser and Hunt method of 17 staging systems in which the labelling nomenclature was given in Roman (stages I to xv).

Statistical Analysis:
The data collected in excel sheet was exported to spss software version 23. Descriptive statistics was done using frequency and percentage. Means and standard deviations were used to convey continuous variables.

3.   Result

The results showed that standard deviation for Male 37 staging is ± 2.62 years are shown (Table: 1) and Female 37 staging is ± 2.58 years are shown (Table:2).The combination of Male and female tooth number 37 staging is revealing the good results with the standard deviation of ± 2.55 years are shown (Table: 3).

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Male	13.7600	50	2.61518	.36984
	Female	14.5800	50	2.58006	.36488

Table 1: Table represents Mean and Standard deviation values of male and female for 37 staging

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	N	Minimum	Maximum	Mean	Std. Deviation
Male	50	8.00	17.00	13.7600	2.61518
Female	50	7.00	17.00	14.5800	2.58006
Valid N (listwise)	50				

Table 2: Table represents descriptive statistics of male and female for 37 staging

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Male - Female	-.82000	2.54502	.35992	-1.54329	-.09671	-2.278	49	.027

Table 3: Table represents Mean and Standard deviation values for combination of Male and female for 37 staging
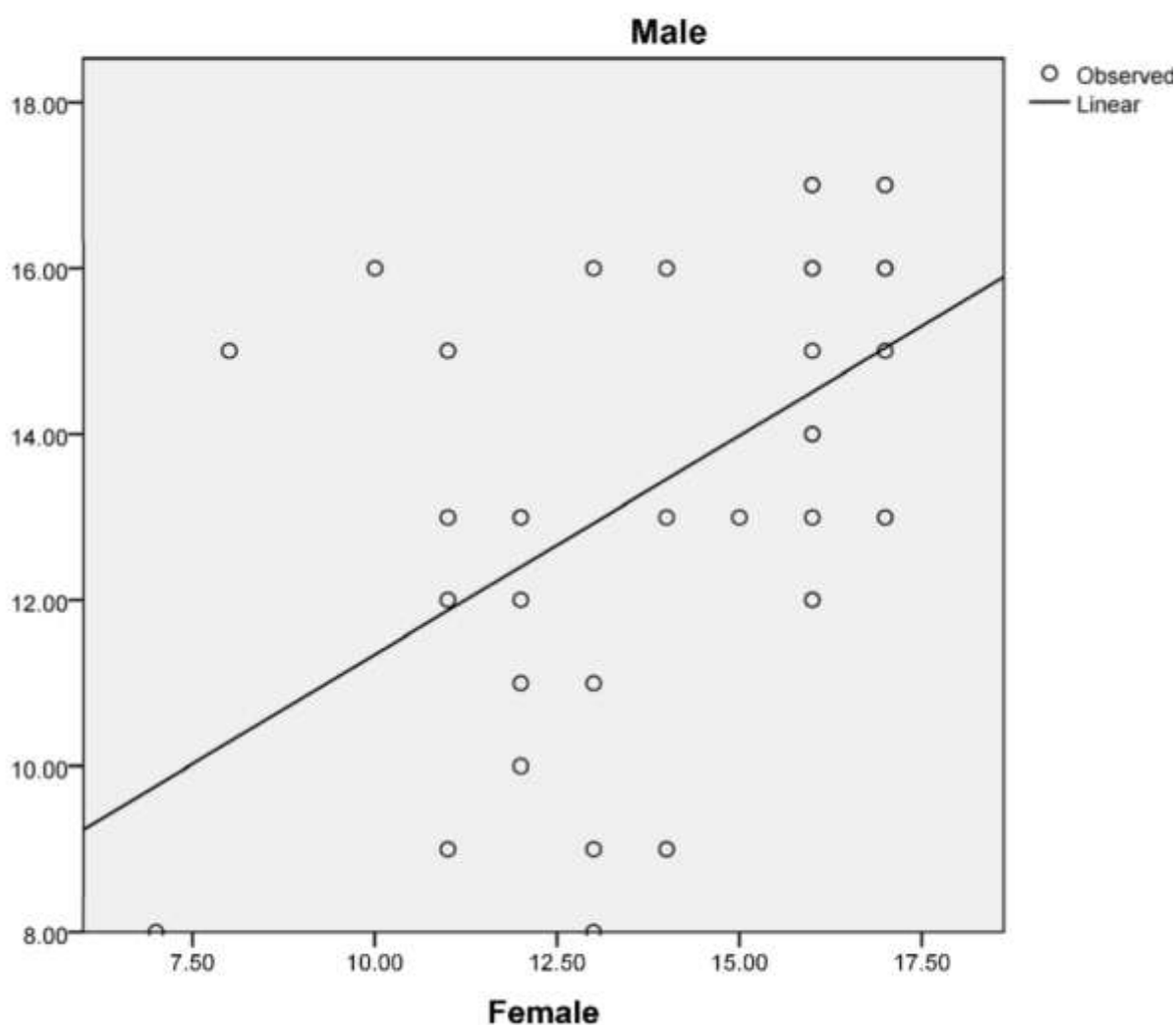

Figure 1: Bar graphs showing association between dependent variable male and independent variable female

Figure 2: Modified Gleiser and Hunt method illustration

4. Discussion

Individual age-group estimation is critical in forensic dentistry and for a variety of medico-legal objectives[20]. Depending on the methodology used in practice, the data of dental age estimation can take various forms. The Gleiser and Hunt method was used in this study. The combination of Male and female tooth number 37 staging is revealing the good results with the standard deviation of ± 2.55 years. Compared to other methods, radiological methods have certain advantages over histological and biochemical methods[21]. Other techniques require the extraction or preparation of microscopic sections of at least one individual's tooth[22]. It is not influenced by local variables such as insufficient space or over retention of deciduous teeth, so the age estimation would be relatively accurate since the number of teeth passing through various stages of calcification is available[23].

In the previous study they concluded that Male 37 staging seems to have a standard deviation of 2.15 years, and Male 38 staging has a standard deviation of 1.29 years. Furthermore, the standard deviation for Female 37 staging is 2.58 years and for Female 38 staging is 2.24 years. The combination of Male tooth numbers 37 and 38 staging reveal the good

outcomes with a standard deviation of 1.23 years, whereas the combination of Female tooth numbers 37 and 38 yields average results of 2.18 years[24].According to Vanessa Sartori et.al, Male individuals had earlier tooth mineralization, but there were no significant changes in the method's applicability between sexes.Based on the ROC curve, evaluating a single third molar for age estimation yields a maximum of 70.4% reliability[25]. Almedia et.al studied the chronology of second molar development in Brazilians and its application to forensic age estimation, Females developed their teeth earlier than males, and there was no significant difference between the right and left second permanent molars[26]. In The previous investigation, using the Modified Gleiser and Hunt technique, there was no significant difference between right and left third molars on the upper and lower jaws in both boys and girls (P>0.05)[27]. Soukaina Ryalar et al. studied Impaction of lower third molars and their association with age. Vertical pattern of impaction was most common in patients over the age of 20 (21.4%), while horizontal impaction was more common in younger patients (21.3%)[28].

5. Conclusion

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Age estimation plays an important role in forensic, legal and criminal proceedings Gleiser and Hunt developed a far more reliable technique of determining the dental and chronological age of a child and adolescent aged 10 to 20 years using a radiological method of permanent mandibular second molars.

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Conflict Of Interest :
All the authors declare that there was no conflict of interest in the present study

Authors Contribution:
Jayavarsha.v - Study designing, data collection, analysis interpretation and manuscript preparation.

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