

Analysis of Pulp Chamber Size on Mandibular Second Molar using Biometric Methods on Panoramic Radiograph in Mongoloid Malayan Race Female Population

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Abstract : The pulp chamber size is very important to be known by a dentist. Anomalies can occur in the chamber of the pulp, called taurodontism. Second molar in mandible is a tooth that can experience taurodontism. This anomaly can affect the success in endodontic treatment. This research aims to determine the pulp chamber size on mandibular second molar in Mongoloid Malayan Race female population using biometric methods, and to compared the pulp chamber size between two regions of the mandible (right and left). Materials and Methods: this research was an analytical study with cross-sectional method. Samples obtained based on research criteria with a total sample of 104 panoramic radiograph. The pulp chamber was measured using biometric method and analysed using Chi-Square analysis. Results: prevalence of normal pulp chamber size was 62,5%, and anomaly (taurodontism) 37,5%. Statistically, the difference taurodontism in the second molar between the two mandibular regions (right and left) was insignificant Conclusion: taurodontism can be diagnosed by biometric methods on panoramic radiographs. Female may also have anomaly pulp chamber size (taurodontism) in mandibular especially in second molar

1 INTRODUCTION

Teeth have a pulp chamber that is in inside the crown. Pulp chamber on posterior teeth is only one. Mandibular molar is the multirooted teeth and has the pulp chamber. It have a floor at the cervical portion withan opening or each root canal (Scheid RC, 2017).

The pulp chamber anomaly can affecting the size of morphology in permanent dentition or called by taurodontism. The aetiology of taurodontism is unclear. Taurodontism is the pulp chamber which enlarges toward apical in the bifurcation area of the tooth, so that the pulp chamber is larger than its normal size (Scheid RC, 2017).

Taurodontism is an anomaly where the dentist must identify it before endodontic treatment. Taurodontism can make treatment procedures more difficult to find root orifice, cleansing and filling the root canal material (obturation) (Marques-da-Silva B, 2010).

Taurodontism diagnosis is performed by radiographic. In the panoramic radiograph, this

anomaly can be measured by biometric method and classified as hypodont, mesodont, and hyperdont (Hegde V, 2013). Taurodontism can occur in mandibular second molar. It is more common in second molar teeth (43%) than first molar teeth (12%) (Cakici F, 2015). Females are often found compared to males, 293 teeth had taurodontism, 179 in females and 114 in males (Mosfeghi M, 2015), female 19,6% than males 13,4% (Abosede YT, 2015).

Indonesia is largely a Mongoloid Race, consisting of Proto and Deutro Melayu or called as Mongoloid Malayan Race. Identification of the size of pulp chamber and anomaly such as taurodontism can helpful dentist to prevent treatment accidents, especially in endodontic treatment. The purpose of this research was to analyze the size of mandibular second molar pulp chamber in population of Mongoloid Malayan Race female using biometric method and to compared the size from the second molar pulp chamber between the right and left region mandibular.

2 METHODOLOGY

This study was an analytical study with cross-sectional method. Samples were female patients in Rumah Sakit Gigi dan Mulut Universitas Sumatera Utara aged between 19 until 25 years and in accordance with the research criteria. Inclusion criteria are two previous generations of Mongoloid Malayan Race, it has complete mandibular second molar in right and left region, and exclusion criteria was root fractures. The patient carried out panoramic radiography, and then analyzed by biometric method. The total radiograph analyzed was 52 photos. This study was carried out with approval from the Research and Ethics committee Faculty of Medicine in Universitas Sumatera Utara/ Rumah Sakit Umum Pemerintah Haji Adam Malik.

Assessment of the size pulp chamber mandibular second using biometric method (CB/R). CB line is determined by connecting point C (Crown) and point B (Body). Point C is the lowest part of the occlusal part and point B is in the bifurcation section. After that the R line is determined by connecting point B and point R (Root). Point R is in the root apex (Figure 1). The classification (CB/R) are cynodont (normal) $< 1,10$; hypodont : $1,10 - 1,29$; mesodont : $1,30 - 2,00$; hyperdont : > 2 .

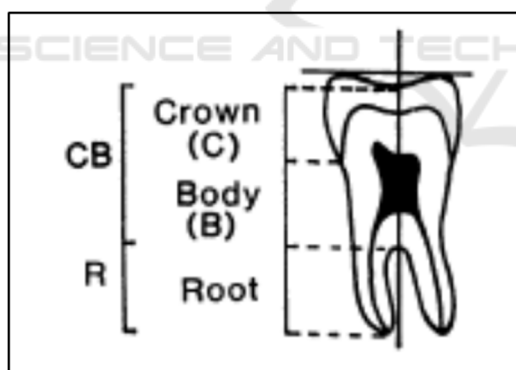


Figure 1. Biometric method to measure pulp chamber (Hegde V, 2013).

This research using Chi-square analysis, to compare the prevalence of the anomaly of pulp chamber size (taurodontism) between right and left region groups and $p < 0.05$ was statistically significant.

3 RESULTS

The study group compared the anomalies of pulp chamber size or taurodontism in second molars between in two regions of mandible (right and left) and age range of between 19 until 25 years. Analysis of the data showed that 47 mandibular second molar of the subject have anomaly pulp chamber size (taurodontism), hypodont (24%), mesodont (20,2%), and hyperdont (1%) (Table 1).

Table 1: Prevalence of pulp chamber size mandibular second molar in Mongoloid Malayan Race female population

Types	N	%
Cynodont (Normal)	65	62,50
Hypodont	25	24,0
Mesodont	13	12,5
Hyperdont	1	1
Total	104	100

Comparison of the occurrence of taurodontism in mandibular second molars between two sides mandibular was analysed in Table 2, as shown was no statistically significant difference with $p > 0,05$.

Table 2: Comparison of the presence of taurodontism in mandibular second molar on right and left region using chi-square test

Region	Types of Taurodontism (N)			Total	P
	Hypo-dont	Meso-dont	Hyper-dont		
Right	12	6	1	19	$> 0,05$
Left	13	7	0	20	

4 DISCUSSION

The results in this research is a group of Mongoloid Malayan Race female dental patient have shown the prevalence pulp chamber size mandibular second molars 62,5% normal (cynodont) and 37,5% (anomaly) (Table 1), that is hypodont (24%), mesodont (12,5%), and hyperdont (1%). Prevalence of hypodont is common than mesodont and hyperdont. This result is same in previous study. Research from Gupta and Saxena obtained the result

of hypodont type more common in 32 mandibular second molars than mesodont (24 teeth) and hyperdont (11 teeth) (Gupta SK, 2013).

In the Nigerian population also found similar results with this study, the hypotaurodont type (14,7%) more often appears compared to other types (mesodont 4%, hyperdont 0,4%) (Abosede YT, 2015). Prevalence of anomaly of pulp chamber size mandibular second molar (taurodontism) in this study is greater than the research of Abosede and Efunyemi. Differences in these results can occur indicating ethnic diversity in different populations. Statistically, the results from this research were no difference for the occurrence of second molar taurodontism in both mandible regions (right and left) significantly. The result is same likes Abosede and Efunyemi's study, both the right and the left regions have almost the same percentage that is 37,5% dan 31,3%.

5 CONCLUSION

In this study, it is seen that mandibular second molars from female may also have anomaly pulp chamber size (taurodontism). Although panoramic radiography is a type of extraoral radiography, but analysis using biometric method in panoramic radiograph can be useful to diagnose condition of morphology pulp chamber before doing the endodontic treatment. If the type of pulp chamber size is known, it can be easier to help find the location of the root orifice and prevent treatment failure in endodontic treatment.

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