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THIRD MOLAR IMPACTION AND AGENESIS: A REVIEW

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ABSTRACT

In clinical dentistry third molar have great prevalence. These teeth are commonly found to be impacted and sometimes it's may absent in the oral cavity. The aim of the study was to evaluate the prevalence of different pattern, angulation of third molar impaction and third molar agenesis between different ages of different races. Several electronic databases such as Google Scholar, PubMed, Web of Science and Science Direct were systematically searched for studies published until March 2015. The mandibular impactions were found to be more prevalent as compared to maxillary impaction. However the agenesis of third molar does not depend on age, sex and race.

KEY WORDS: Third Molar, Impaction, Agenesis, Orthopantamograph.

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INTRODUCTION

The third molars (M3) are also called "Wisdom Teeth"[1]. M3 generally appear between ages of 17-25 years. Impacted M3 is of great concern in dentistry as unerupted or partially erupted teeth and can lead to dental crowding[2]. Tooth impaction is a pathological condition in which a tooth cannot or will not erupt into its normal functioning position, unless facilitated by treatment[3]. The M3 impaction is associated with various pathologic conditions such as pericoronitis, dental caries, root resorptions, cystic processes and tumours. Mandibular M3 is the most usually impacted teeth found in human[5]. The prevalence of M3 impaction ranges from 27-68.6 %[3,6-8]. A few studies have reported the prevalence of M3 to be 32-40.5%[3,7]. Previous study reports showed greater prevalence of impaction in females as compared to males[8,9], but some authors do not agree with those findings. According to their studies, there are no gender predilections in M3 impaction[7,10-12]. Tooth agenesis commonly referred as hypodontia, describes the developmental absence of one or more teeth either in primary or permanent dentition[13]. Agenesis of one or more permanent teeth is a common anomaly in human. Over the last 50 years many reports on M3 agenesis have been published for different population[11,14-32,34]. Agenesis is found to be associated with widely varying irregularities in sizes, morphologies[35] and times of the development of the teeth in the oral cavity[35-37].

Now the aim of this study to review-

- Prevalence of impacted M3.
- Different angulations and patterns of M3 based on different methods between different populations.
- The agenesis of M3 between different populations.

MATERIALS AND METHODS

First the strategy was to search the electronic database (Table-1) with various key word combinations (Table-2). The search was directed in four main databases and the search for article was carried out until March 2015. Additionally oral and maxillofacial surgery and orthodontics textbooks as well as the reference lists were hand searched.

Table 1
Electronic database search

Google Scholar
PubMed
Science Direct
Web of Science

Table 2
Key Word Combination

Review + M3
Review + Agenesis + M3
Impaction + M3
OPG + Impaction + M3
Prevalence + Pattern + M3
Prevalence+ Impaction + M3

M3-Third Molar, OPG–(Orthopantamograph)

Pell and Gregory Classification

This classification based on[38]

- The amount of tooth covered by the anterior border of the ramus (Class I, II, III).
- The depth of the impaction relative to the adjacent tooth (Class A, B, C)[39].

Class I- Situated anterior to the anterior border of the ramus.

Class II- Crown ½ covered by the anterior border of the ramus.

Class III- Crown fully covered by the anterior border of the ramus

Class A- The occlusal plane of the impacted tooth is at the same level as the adjacent tooth.

Class B- The occlusal plane of the impacted tooth is between the occlusal plane and the cervical line of the adjacent tooth

Class C- The occlusal plane of the impacted tooth is apical to the cervical line of the adjacent tooth.

Winter's Classification:

The classification based on the inclination of the impacted M3 to the long axis of the 2nd molar[40].

Mesio-Angular

The impacted tooth is tilted towards the 2nd molar in a mesial direction.

Disto-Angular

The long axis of the M3 angled distally/posteriorly away from the 2nd molar.

Horizontal

The long axis of the M3 is horizontal to 2nd molar.

Vertical

The long axis of the M3 is parallel to the long axis of the 2nd molar.

Bucco-lingual

In combination with the above the tooth can be bucally (tilled towards the check) or lingually (tilled towards the tongue) impacted.

Transverse

This is where the tooth is in horizontal impaction but in a cheek-tongue direction.

DISCUSSION

In modern civilization M3 impaction is the common abnormality of human all over the world. It has different pattern, angulation and it varies in different races. So knowledge of prevalence of M3 impaction had great importance to the clinicians and patients. In this review prevalence of mandibular M3 impaction was frequently recorded as compare to maxillary M3 impaction. Wahid et al.[41], studied 197 OPGs of Pakistani population, aged 18-50 years, that presented in dental clinic of the Madina Teaching Hospital. All data were statistically analysed by Chi-squared test. Teeth positions and angulations were analysed by Pell and Gregory classification[38] and Winter's[40] classification. They analysed the impacted teeth among genders and age group. This study showed mandibular M3 impaction was more prevalent as compare to maxillary M3 impaction. Vertical impaction of maxillary M3 and mesio-angular impaction of mandibular M3 were more prevalent. Hashemipour[42], studied on 1020 OPGs of Iranian population aged between 19 to 55 years. This was also based on Pell and Gregory classification[38] and Winter's[40] classification to evaluate the pattern of M3. This investigation agreed with Wahid et al.[41]. Hasan[3] studied on 1039 OPGs of Saudi population, aged between 19 to 46 years, where 60.49% had mandibular impaction and 39.51% had maxillary impaction. This study was also similar with Wahid et al.[41] and Hashemipour[42]. According to Quek et al[8] classification Rahman et al[48] also found mesio-angular impaction of mandibular M3 were more prevalent among the Malaysian population. In another study Rahman et al[49] studied 54 OPGs of Malaysian people attended in HUSM. This study based on Pell and Gregory classification and through the radiological investigation, Class II is most common level of impaction in mandibular M3. Nazir et al.[44] found pathologies associated with impacted teeth. Caries and pericoronitis were the most common pathologies. Al-Anqudi et al.[45] found 32% of people had only one, 42% of people had two, 15% of people had three, 12 % of people had four M3 impacted. This study was similar to the study report of Quek et al[8]. So all the studies showed that mandibular impaction is more common than maxillary impaction.

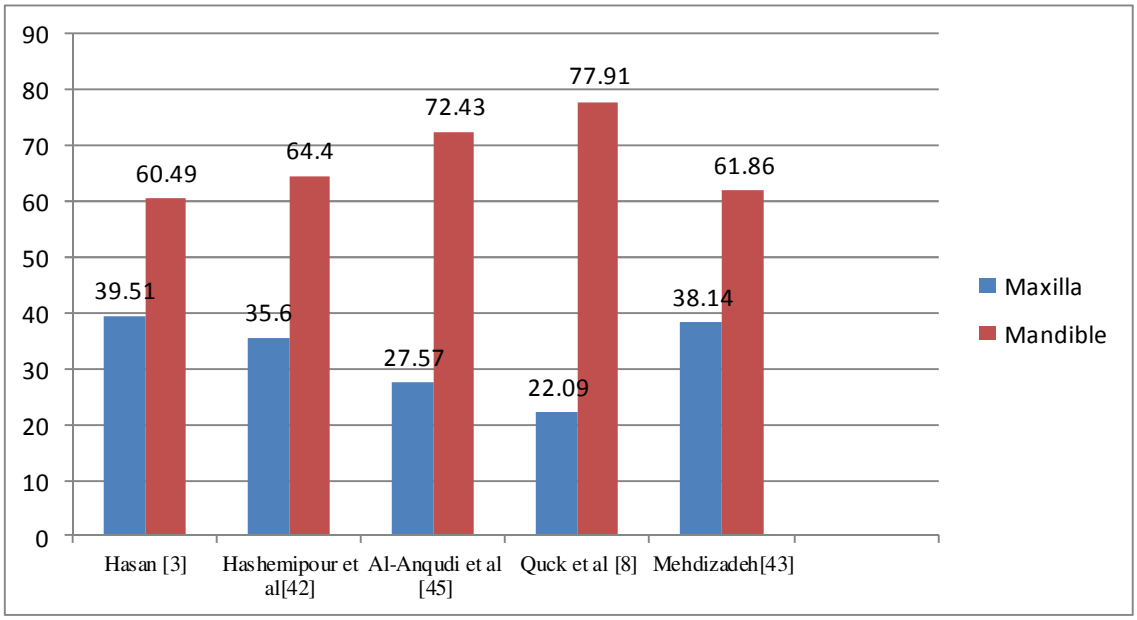

Figure 1
Difference between Maxillary and mandibular impaction[3,8,42-44].

Tooth agenesis is the most common craniofacial anomaly recorded in humans. Alam et al.[46] found 31% of Malaysian population had one or more M3s agenesis. Lee et al.[31] reported 41% agenesis in Korean population. Harris and Clark[15] reported 31.5% agenesis in American white and 10.1% in American blacks. Sandhe and Kaur[32] reported 11.5% agenesis in Indian population and Bredly et al.[21] reported 20.7% agenesis in German population. Fig-14 shows the global distribution of prevalence of M3 agenesis. According to Alam et al.[46] the order of agenesis was two, one, four and three. This study is irrational with other studies[27, 29, 31, 33].

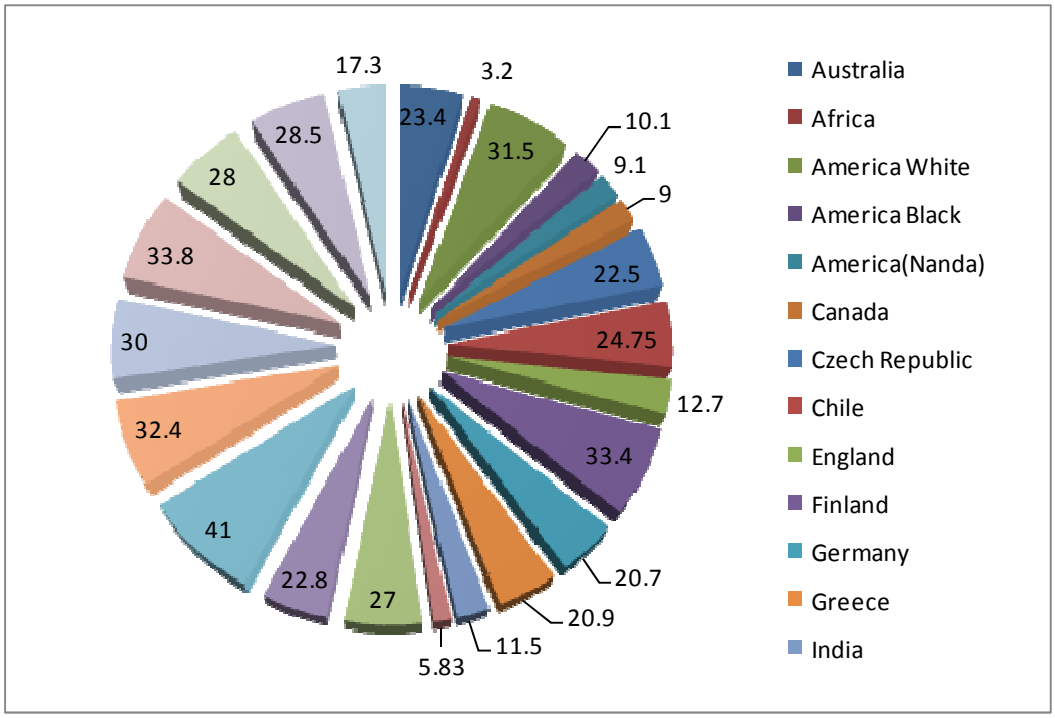

Figure 2
Global Distribution of Prevalence of M3 Agenesis[46]

Jacob et al.[33] found M3 agenesis more common in female (27.5%), Alam et al.[46] stated that, there were no significant difference between male and female, higher percentage noted on their study for male than female (32.9% and 28.8%, respectively). But Lee et al.[31], Gracia-Hernandez et al.[18], Celikoglu et al.[29] agreed with Jacob et al.[33] findings. One method to measure arch width has been discussed and used in a study by Patel [47] but the measure which this study has discussed is the widely used method.

CONCLUSION

From this study it can be concluded that mandibular impactions are more prevalent as compared to maxillary impaction. Maxillary vertical impactions and mandibular mesio-angular impactions were more prevalent. Moreover, agenesis of M3 does not depend on age, sex and race. Finally we believe that this study will be beneficial for the patients and clinicians.

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