

Prevalence of Impacted Molar Teeth among Saudi Population in Asir Region, Saudi Arabia – A Retrospective Study of 3 Years

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ABSTRACT

Aim: To report the prevalence of impacted third molars according to the age, gender and type among Saudi population.

Materials and methods: This retrospective study involved 3800 panoramic radiographs of subjects aged 18 to 45 years who presented to the College of Dentistry, King Khalid University, Abha, Kingdom of Saudi Arabia for oral care during the period from February 2009 to February 2011. Data collected was entered into a spreadsheet (Excel 2000; Microsoft, US) and analyzed using Statistical Package for Social Sciences (SPSS) version 16.0.

Results: A total of 713 impacted teeth were identified (18.76%) ($p=0.003$). The male to female ratio with impacted third molars was 604:109 (5.54:1) and the ratio of patients with impacted teeth was (5:1). Age group 1 (i.e., 20 to 25 years) had the highest prevalence of third molar tooth impaction (64.5%) and this decreased with increasing age.

Conclusion: Incidence of tooth impaction is higher in the mandible than in maxilla. Males had a higher incidence of third molar impaction as compared to the females. Highest incidence is found in the age group of 20-25 years. Mesio-angular impaction was the most predominant type.

Key words: Impacted, third molar, mandibular, maxillary.

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Introduction:

Tooth impaction is a frequent phenomenon^{1,2}. An impacted tooth is one that is erupted, partially erupted, or unerupted and will not eventually assume a normal arch relationship with the other teeth and tissues³. Local factors causing third molar impaction include crowding, ectopic position of the tooth germ, supernumerary teeth, and soft tissue or bony lesions. Mandibular and maxillary third molars are the most frequently impacted teeth, with slight predilection to the

former^{3,4}. The third molars being the last to erupt have a relatively high chance of becoming impacted⁵. Many theories have been proposed to explain the incidence of impacted mandibular third molars. The prominent among these are mendelian theory, phylogenic theory and orthodontic theory. Most of these theories stress on the discrepancy of jaw size to the tooth size which further has been related to the dietary habits which varies from one region to the other. Considerable variation has been reported in the

prevalence and distribution of impacted teeth in different regions of the jaw. Factors affecting the prevalence include the age, timing of dental eruption, and the radiographic criteria for dental development and eruption¹. Data regarding the

radiographs were taken with standardized equipment and specifications. The tooth was considered impacted when it was not aligned with the rest of the teeth in occlusion. Data regarding age, sex, number of impacted teeth,

Table I: Impaction Occurrence in Relation to Age Group

Age Group	Impaction Occurrence			Total
	Maxillary	Mandibular	Arches	
1 (20-25 years)	75	212	173	460
	16.3%	46.1%	37.6%	100.0%
2 (26-30 years)	34	94	39	167
	20.4%	56.3%	23.4%	100.0%
3 (31-35 years)	18	41	14	73
	24.7%	56.2%	19.2%	100.0%
4 (36-40 years)	4	5	4	13
	30.8%	38.5%	30.8%	100.0%
Total	131	352	230	713
	18.4%	49.4%	32.3%	100.0%

prevalence of impacted third molars and the role of various factors influencing the morbidity associated with these teeth among Saudi population is scarce. The purpose of this study was to report the prevalence of impacted third molars according to the age, gender and type of impaction among Saudi population.

Materials and Methods:

This retrospective study involved 3800 panoramic radiographs of subjects aged 18 to 45 years who had presented to the College of Dentistry, King

arch involved, and type of impaction were obtained from patients' records and panoramic radiographs were individually examined by a two investigators.

The angulation of impacted third molar was recorded based on WINTER's classification with reference to the angle formed between the intersected longitudinal axes of second molar and third molars. The angulation of impaction was measured using Queket al.,(2003) method to classify vertical impaction (10° to -10°), mesioangular impaction (11° to 79°), horizontal

Table II: p Value for Impaction Occurrence in Relation to Age Group

	Value	df	Asymp. (2-sided) (p value)
Pearson Chi-Square	19.774(a)	6	0.003

Khalid University, Abha, Kingdom of Saudi Arabia, for oral care during the period from February 2009 to February 2011. All panoramic

impaction (80° to 100°), distoangular impaction (-11° to -79°).

Data collected was entered into a spreadsheet (Excel 2000; Microsoft, US) and analyzed subsequently using Statistical Package for Social Sciences (SPSS) version 16.0. The prevalence of impacted third molars in relation to age, gender and type was assessed and displayed by frequency and percentage. p value assessed through Pearson Chi-square test.

Results:

The study sample comprised of 3800 panoramic radiographs. A total of 713 impacted teeth were

maxillary arch alone had impacted third molars (Table I). The ratio of mandibular to maxillary third molar impaction was 2.68:1.

In both males and females, the impacted third molars were more prevalent in mandibular arch (49.5% and 48.62%) (Table III). The male to female ratio with impacted third molars was 604:109 (5.54:1) with a p value of 0.707 ($p=0.707$) (Table IV) which is not significant statistically.

Among the impacted mandibular third molars, 50.75% of the patients had mesio-angular impaction which constitutes the majority and only

Table III: Impaction Occurrence in Relation to Gender

Gender	Impaction Occurrence			Total
	Maxillary	Mandibular	Both the Arches	
Male	108	299	197	604
	17.9%	49.5%	32.6%	100.0%
Female	23	53	33	109
	21.1%	48.6%	30.3%	100.0%
Total	131	352	230	713
	18.4%	49.4%	32.3%	100.0%

identified (18.76%) ($p=0.003$) (Table II). The male to female ratio with impacted third molars was 604:109 (5.54:1) and the ratio of patients with impacted teeth was (5:1). Age group 1 (i.e., 20 to 25 years) (Table I) had the highest prevalence of third molar tooth impaction (64.5%) and this decreased with increasing age.

Of the 713 impacted molars, majority were mandibular third molars (49.4%), followed by

1.4% of the patients had disto-angular impaction. 52% of the impacted maxillary third molars had vertical impaction and the least prevalent among the impacted maxillary molars was horizontal impaction (1.5%).

Discussion:

An impacted tooth is "a tooth that cannot, or will not erupt into its normal functioning position, and

Table IV: p Value for Impaction Occurrence in Relation to Gender

	Value	df	Asymp. (2-sided) (p value)
Pearson Chi-Square	0.692(a)	2	0.707

impacted teeth in both the maxillary and mandibular arches (32.3%). In 18.4%, the

is therefore pathologic and requires treatment"⁴. Any permanent tooth in the dental arch can be

impacted, but the teeth most frequently involved in a descending order are the mandibular and maxillary third molar, the maxillary canines, the mandibular and maxillary second premolar, and maxillary central incisors⁶. According to Othman R et al., the mandibular third molars are the most frequently impacted teeth in the humans and surgical extraction has become one of the most common dentoalveolar surgeries⁷. The etiology of impaction is multifactorial⁸. Impacted teeth may be associated with periodontal disease, dental caries, odontogenic cyst and tumors, pain of unexplained origin, jaw fracture, and resorption of root of the adjacent tooth⁹.

This retrospective study to assess the prevalence of impacted third molars among Saudi population included 3800 subjects. To ensure diagnostic validity in this study, radiographic findings were verified with clinical records, which were collected on standard forms as part of routine examination process. A total of 713 (18.76%) patients had impacted third molars with a p value of 0.003(p=0.003) (Table II) which is statistically significant. Haider and Shalhoub¹⁰ in 1986 conducted a similar study among Saudi population and reported 34% and 29% prevalence of impacted third molars for males and females respectively. Ioannis G et al², in their retrospective study among Greek population reviewed 425 patients with impacted teeth and reported a prevalence rate of 0.001(p=0.001). FCS Chu et al¹, conducted a retrospective study among Hong Kong Chinese population which included 7486 patients and reported 28.3% prevalence of impacted third molars. Alexander T et al¹¹, reported a similar prevalence rate of 27.8% among Hong Kong population.

The male to female ratio with impacted third molars was 604:109 (5.54:1) with a p value of 0.707(p=0.707) (Table IV) which is not significant statistically. The results in this study for the male to female ratio of impacted molars is quite similar

to the study conducted by Ioannis G et al², (p=0.651). Mwaniki D et al⁵, in their study involving Kenya patients reported the male to female ratio as 7:5.

Age group 1 (20 – 25 years) had the highest prevalence of third molar tooth impaction (64.5%) and this decreased with increasing age. Similar to other studies and as widely stated in the literature^{2,4,12}, the prevalence of impacted third molars was much higher in the mandibular arch as compared to maxillary arch (49.4% to 18.4%). In both males and females, the impacted third molars were more prevalent in mandibular arch (49.5% and 48.62%). Even with regard to the age group, the maximum prevalence of impacted third molars was in the mandibular arch in any of the age group in this study. The ratio of mandibular to maxillary third molar impaction was 2.68:1.

Among the impacted mandibular third molars, majority of the patients had mesio-angular impaction (50.75%) and only 1.4% of the patients had disto-angular impaction. Contrary to the type of impaction in mandibular arch, vertical impaction was the most common type in the maxillary arch (52%) and horizontal impaction the least prevalent one (1.5%). There are various theories widely stated in the literature to explain the development of impacted teeth. One among them, The Belfast Study Group specifically explains the development of type of impaction among the mandibular third molars. According to them, there may be differential root growth between the mesial and distal roots, which causes the root to either remain mesially inclined or rotate to a vertical position depending on the amount of root development. Underdevelopment of the mesial root results in mesioangular impaction. Higher prevalence of mesio-angular impaction may be related to the more common underdevelopment of mesial root.

Conclusion:

- A) Incidence of tooth impaction is higher in the mandible than in maxilla.
- B) Males had a higher incidence of third molar impaction as compared to the females.
- C) Highest incidence is found in the age group of 20-25 years.
- D) Mesio-angular impaction was the most predominant type.

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