

Pattern of Presentation and Socioeconomic Distribution of Patients Presenting With Impacted Third Molar at Lagos State University Teaching Hospital Nigeria

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Abstract

Tooth impaction occurs when a tooth is prevented from erupting into the oral cavity which is their functional position within an expected time. The mandibular third molars are the most frequently impacted tooth in the oral cavity. Some studies have reported a higher frequency in females than males. A search through the literature shows that no study has been done to ascertain the socioeconomic status of patients presenting with third molar impaction in Nigeria. This study is therefore aimed at determining the pattern of presentation and socioeconomic distribution of patients presenting at the Lagos state University Teaching Hospital for extraction of impacted third molar. 337 patients with impacted third molar who had indication for extraction and had met the inclusion criteria were included in the study after obtaining a signed consent. The positions of impacted third molar teeth on the panoramic radiographs were documented. Associated disorders and every other indication for surgical extraction was documented. Patients were stratified into three socioeconomic classes using the modified version of questionnaire by chukwuonye et al and Balogun et al. Data were analyzed using a Pearson chi-square test, performed using the Statistical Package for the Social Sciences (version 20; SPSS, Inc, Chicago, IL). A total of 337 patients met the inclusion criteria within the two year study period. The sample consisted of 129(40.9%) male and 208(59.1%) female. The difference between male and female was statistically significant ($P=0.04$). Most third molar extraction that was recorded in the third decade of life where 172 (51.0%) cases were recorded. The most prevalent type of impaction recorded was the mesio-angular position (49.9%). The most common pathology associated with impacted third molars was pericoronitis which was recorded in 135 cases out of total of 337 patients. Majority of the patients who had third molar extraction belong to the middle socioeconomic class (42.7%) followed by patients in high socio-economic class (40.9%). Third molar impaction was commoner in females than males with mesio-angular impaction being the most common type. It was most commonly found in the third decade of life and pericoronitis was the most common associated pathology. Majority of the studied subjects belong to the middle socioeconomic class.

Keywords: Third molar, Impaction, Associated pathologies, Socioeconomic status.

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INTRODUCTION

Tooth impaction occurs when a tooth is prevented from erupting into the oral cavity which is their functional position within an expected time [1]. The mandibular third molars are the most frequently impacted tooth in the oral cavity [2]. Third molars eruption is variable, ranging from age 18 to 24 years [3]. Lack of space or physical barrier among other factors may be the cause of impaction [1]. Furthermore

racial variation in facial growth, jaw and teeth size, nature of diet, extent of generalized tooth attrition, degree of use of masticatory apparatus and genetic inheritance are the crucial factors which determines the eruption pattern, impaction status and the incidence of agenesis of third molars[4]. Most studies have reported no gender differences in third molar impaction [5, 6]. However, some studies have reported a higher frequency in females than males [7].

Mandibular third molar impaction has been classified, based on the level of impaction, the angulations of the third molars, and the relationship to the anterior border of the ramus of the mandible [8]. Winters and Pell [9] and Gregory [10] classifications are most commonly used to classify impacted mandibular third molars.

Third molar impaction has been directly or indirectly associated with numerous disorders in the mouth, jaw and facial regions. Therefore, their extraction is one of the most common surgical procedures for Oral and Maxillofacial surgeons [11]. This may be a simple forceps extraction or more complex surgical procedure. Surgical methods vary among surgeons depending upon their training and experience [12].

A search through the literature shows that no study has been done to ascertain the socioeconomic status of patients presenting with third molar impaction in Nigeria. Third molar impaction and other forms of malocclusion are common disorders in countries with a high standard of living [13, 14]. However, there is no consensus on various socioeconomic classifications in Nigeria, because of the unstructured nature of the society [15]. This study is therefore aimed at determining the presentation pattern and socioeconomic distribution of patients presenting at the Lagos state University Teaching Hospital for extraction of impacted third molar.

METHODOLOGY

A prospective study conducted in the Department of Oral and maxillofacial Surgery, Lagos state university teaching hospital from June 2017 to June 2019 on patients who had indication for surgical removal of impacted third molars. This study is an extract of a larger study which was conducted in the same department after securing clearance from the ethical committee.

A signed consent was obtained after giving necessary information to the patients regarding the study and the surgical procedure. The age, sex, number of impacted third molar was obtained through history taking, clinical examination and radiographic study. Third molar was considered impacted if it did not have functional occlusion and at the same time, its roots were fully formed.

The positions of impacted third molar teeth on the panoramic radiographs were documented. The angulation of impacted third molar was documented based on Winter's classification with reference to the

angle formed between the intersected longitudinal axes of the second and third molars.

The presence of related symptoms including pain, pericoronitis, lymphadenopathy and trismus was noted for every patient. Associated disorders and every other indication for surgical extraction were documented.

Exclusion criteria—Patients with any systemic diseases like diabetes, or any craniofacial anomaly or syndrome, pathological dento-alveolar condition, absence of mandibular second molar

A modified version of the socioeconomic status (SES) questionnaire used by Chukwuonye *et al.* [15] and Balogun *et al.* [16] was used to collect information on the subjects' highest educational attainment and level of income. This was used to classify the subjects into the 3 different socioeconomic groups. Income included all possible sources of income available to the individual. For the unemployed patients the total per capita income of the head of the family was used. Therefore, respondents were categorized into three classes, according to their reported income. Low income earners received 18,500 Naira (₦) or less per month – the minimum wage in Nigeria. The middle-income class earned ₦85,000 or less per month – about the salary level of a newly employed Nigerian graduate. The upper income class earned more than ₦85,000 per month). Educational level was defined as the highest level of individual education completed and was categorized into four groups: No formal education; primary (1–6 years); secondary (7–12 years); and, tertiary (≤ 13 years). The Incomes are scored 1 to 3, with 1 denoting low income, 2 denoting Middle income and 3 denoting High income. For educational level, 0 denotes no education, 1 denotes primary, 2 denotes secondary and 3 denotes tertiary education.

Based on the summative score, the participants were categorized into lower, middle, or upper socioeconomic class. Score 1 to 2 was for low socioeconomic group, middle (3-4) and upper socioeconomic group (5-6).

Data were analyzed using a Pearson chi-square test, performed using the Statistical Package for the Social Sciences (version 20; SPSS, Inc, Chicago, IL). The age, gender, number of impacted third molars and classification of impaction were displayed by frequency and percentage. The level of significance was 5% ($p < 0.05$) and data were presented with 95% confidence intervals where applicable. All assessment was done by a single examiner to eliminate the inter-examiner errors. All data regarding patient identification and medical conditions were kept confidential.

Table-1: Age distribution by gender

Age group in years	Male	Female	Total	p-value
≤ 20	9(7.0)	19(9.1)	28(8.3)	0.493

21-30	65(50.4)	107(51.4)	172(51.0)	0.392
31-40	44(34.1)	56(26.9)	100(29.7)	0.432
41+	11(8.5)	26(12.5)	37(11.0)	0.503
Total	129(100.0)	208(100.0)	337(100.0)	0.043*
Mean±SD	26.74±4.3	25.76±3.4		

X²= 1.320, p<0.302, SD=Standard deviation

Table-2: Types of impaction

Type of impaction	Right	Left	Total	p-value
Mesioangular	87(51.8)	81(47.9)	168(49.9)	0.594
Horizontal	23(13.7)	27(16.0)	50(14.8)	0.314
Distoangular	15(8.9)	17(10.1)	32(9.5)	0.892
Vertical	41(24.4)	44(26.0)	85(25.2)	0.102
Others	2(1.2)	0(0.0)	2(0.6)	0.720
Total	168(100.0)	169(100.0)	337(100.0)	

P<0.001*

Table-3: Impacted teeth and associated pathologies

Type of impaction	Recurrent Percoronitis	Dental caries	Orthodontic reasons	Apical pathology	Periodontal Pathology	Facial pain	Prophylaxis
Mesioangular	67(49.6)	48(53.9)	7(77.8)	23(56.1)	5(23.8)	8(40.0)	10(45.5)
Horizontal	23(17.0)	6(6.7)	0(0.0)	2(4.9)	8(38.1)	6(30.0)	5(22.7)
Distoangular	15(11.1)	6(6.7)	0(0.0)	3(7.3)	0(0.0)	5(25.0)	3(13.6)
Vertical	30(22.2)	27(30.3)	2(22.2)	13(31.7)	8(38.1)	1(5.0)	4(18.2)
Others	0(0.0)	2(2.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Total	135(100.0)	89(100.0)	9(100.0)	41(100.0)	21(100.0)	20(100.0)	22(100.0)

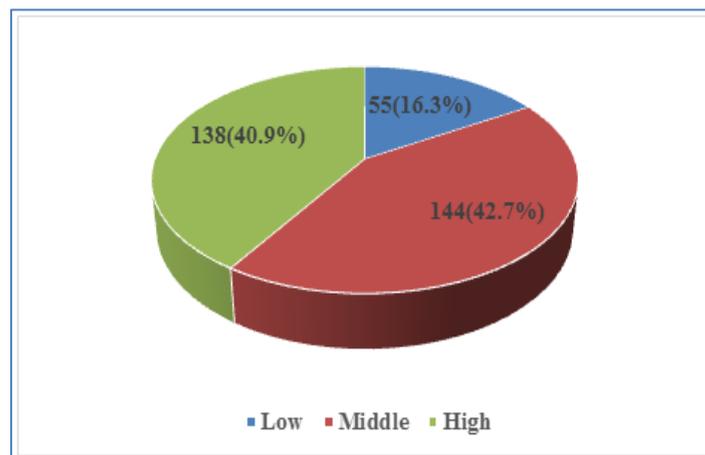


Fig-1: Socioeconomic Distribution of 337 patients with mandibular third molar impaction



Fig-2: Showing mesio-angular impaction of the right and left third molar

RESULT

A total of 337 patients met the inclusion criteria within the two year study period. The sample consisted of 129(40.9%) male and 208(59.1%) female, with age ranging from 18 to 47years and mean age of 25.95 ± 6.6 years. Most third molar extraction that was recorded in the third decade of life where 172 (51.0%) cases were recorded followed by the fourth decade 100(29.7%). Females had more third molar extraction done than male with female to male ratio of 1.6:1. The difference between male and female was statistically significant ($P= 0.04$) Table 1.

The distributions of the third molar extractions done on the left and the right sides do not differ significantly, The most prevalent type of impaction recorded was the mesio-angular position (49.9%)(Figure 2), followed by vertical (25.2%), horizontal (14.8%) and distoangular impactions (9.5%) Table 2.

The most common pathology associated with impacted third molars was pericoronitis which was recorded in 135cases out of total of 337 patients seen within the study period, followed by dental caries 89 cases and 41 cases of apical pathologies were also recorded. The least indication for extraction was recorded in 9 cases of orthodontic treatment. Third molars with Mesio-angular impaction (49.6%) and vertical impactions (22.2%) were more distinctly involved in pericoronitis than the other types of impaction. Table 3.

Majority of the patients who had third molar extraction belong to the middle socioeconomic class(42.7%) followed by patients in high socioeconomic class (40.9%). Only 23(16.3%) patients who were in the low socio-economic group had third molar extraction Figure 1.

DISCUSSION

The third molar is the most commonly impacted tooth in the oral cavity accounting for 98% of all impactions[17] and mandibular third molars are the most frequently impacted[18,19]. There is variation in the frequency of third molar impaction amongst different populations; and these range between 18% and 70% [20, 21]. This is attributed to racial variation in facial growth, jaw and tooth size [17]. Majority of patients who had third molar extraction in this study were in the third decade. This finding is in agreement with other studies in the literature [22, 23]. There was very less number of patients above the age of 40 which is in contrast to the study results reported by Khan *et al*. This may be due to the removal of impacted mandibular third molar at an earlier age [24].

The result of this study showed a higher frequency of third molar impaction in females than

males, this difference was statistically significant. This conforms to previous reports [3, 7]. The higher frequency reported in females is due to the consequence of difference between the growth of males and females. Females usually stop growing when the third molars just begin to erupt, whereas in males, the growth of the jaws continues during the time of eruption of the third molars, creating more space for third molar eruption [25].

The commonest type of impaction in this study is mesioangular. This is similar to the previous reports from Nigeria Pakistan, USA, China, Thailand and Spain [3, 22, 26]. However, a study among Jordanians found that vertical impaction was the most common type (61.4%) and mesioangular type was only 18.1% [27]. The reason for the difference is not clear.

The present study, like most of the similar previous works on associated pathologies with impacted third molar reported higher frequencies in mesioangular and vertical impactions respectively. This may invariably presuppose that some angulations are more prone than the others. However; Polat *et al*. suggested that this may just be because such positions have a higher frequency [28].

Similar to the works of Jamileh and Pedlar [29] and Khawaja [30] pericoronitis was the most common indication for removal of impacted mandibular third molars. We also observed that this pathological condition was more frequent in mesioangular impaction as also been reported by GÜNGÖRMÜS[31] and Kay[32]. Conversely Leone *et al*. had reported vertical and slightly distoangular teeth to be the cause of pericoronitis[33]. However Prajapati *et al*. [34] in their study, recorded caries (especially of the adjacent tooth) and its sequelae as the major reason (63.2%) for the mandibular third molar extraction, followed by recurrent pericoronitis (26.3%) and periodontitis (9.2%). Diet may be a major reason for this difference.

Socioeconomic status (SES) is commonly measured as a combination of income, education, and occupation. However, in most cases, it is measured by the income and level of education [35]. Our study revealed a large number of patients in the middle and high socioeconomic class. Roslind *et al*. [36] in their study in Australia observed the young adult in a higher socioeconomic class to be four times more likely to have the impacted tooth removed in a hospital than a person from a lower socioeconomic group. Third molar impaction and other forms of malocclusion are common disorders in countries with a high standard of living [13, 14].

We therefore inferred with this socioeconomic trend in our study that these patients who had extraction were those who could afford the cost of treatment since funding for dental services is predominantly out-of

pocket expense. Diet may also be another reason since people in these groups are those who may likely feed on diets that could predispose to impaction

CONCLUSION

This study revealed that majority of the third molar impaction was characterized by mesio-angular impaction and was more common in females than males. There was no significant difference between right and left impaction. Third molar impaction was found to be more common in subjects in the third decade of life and pericoronitis was the most common associated pathology. Majority of the studied subjects belong to the middle socioeconomic group.

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