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GENDER RELATED VARIATIONS IN THE DIMENSIONS OF MANDIBULAR RAMUS AND ITS ASSOCIATION WITH LOWER THIRD MOLAR IMPACTION

[1]Samyuktha P S, *[2]Dr. Sangavi R and [3]Dr. Adimulapu Hima Sandeep

[1]Undergraduate student, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

[2]Senior Lecturer, Department of Oral Medicine and Radiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

[3]Associate Professor, Department of Conservative and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha university, Chennai – 600077 Tamil Nadu, India

151701007.sdc@saveetha.com[1], sangavir.sdc@saveetha.com[2] and himas.sdc@saveetha.com[3]

ABSTRACT

Introduction: *When a tooth's eruption path is blocked, it is said to be impacted, with the third molar being the most frequently impacted tooth. The third molar's eruption path has been observed to be obstructed by a number of variables, including soft tissue, bone, and neighboring teeth. Previous studies have reported significant differences in dimensions of ramus and third molar impaction, when compared to patients with normal fully erupted third molars.*

The aim of the current study is to assess the gender related variations in the dimensions of Mandibular ramus and its association with impacted lower third molars.

Materials and Methods: *We divided 120 patients into two groups: an impacted lower third molar group of 90 subjects (50 men and 40 women) and a normally erupted lower third molar group of 30 subjects (20 men and 10 women).*

Results: *Compared to women, men showed higher values for all the factors. Men exhibited increased condylar length, ramus height and ramal width than women in both the impacted and control groups.*

Conclusions: *Thus, it can be concluded that in comparison to the female individuals, the male subjects showed higher values for the majority of the variables. Third molar eruption or impaction may be more likely because of the sex-related mandibular ramus morphology.*

*Keywords**: Impaction, Mandibular ramus, OPG, Mesioangular impaction, Gender variation***

INTRODUCTION

When a tooth's eruption path is blocked, it is said to be impacted, with the third molar being the most frequently impacted tooth. The third molar's eruption path has been observed to be obstructed by a number of variables, including soft tissue, bone, and neighboring teeth.[1] The pathogenesis of third molar impaction has been attributed to pathological lesions, restricted growth of tooth germ as a result of nutritional inadequacy, irradiation, and physical trauma, as well as a lack of space in the dental arch for the third molar to emerge [2]. Regarding the frequency of third molars that are impacted, there are conflicting reports. Third molars that have impacted are more likely to do so in the mandible than the maxilla. The most frequent angulation of mandibular third molar impaction, according to studies, is mesioangular impaction [3]. With conflicting data about the relationship between gender and third molar impaction, a few researchers have attempted to identify if there are any gender differences in mandibular third molar impaction [4]. While one study found a strong correlation between gender and the number of impacted teeth as well as the presence of mandibular impacted teeth, previous investigations found no statistically significant difference between gender and mandibular third molar impaction [2].

In the past forty years, impacted teeth have grown to be a significant problem and are still of interest to many academics. The lower third molar is still the tooth that is most frequently impacted. There is ongoing discussion over the relationship between lower third molar impaction and crowding of anterior teeth [5]. Although the cause of mandibular third molar impaction is unknown, contributing factors include the inclination of the lower posterior dentition, the width of the ramus, and the mismatch between tooth and jaw size[3]. Numerous methods, including panoramic and cephalometric pictures, cone beam computed tomography, and magnetic resonance imaging, are frequently employed to evaluate impaction[6]. Panoramic images are thought to be the least expensive of these and offer a generalized view of the dentition with less radiation exposure[4]. Panoramic photographs do have certain drawbacks, though, including the inability to accurately detect bone relationships, image distortion, and magnification mistakes[7]. The evaluation of mandibular body size and height has made considerable use of panoramic photographs, and the accuracy of such measurements has been confirmed and proven to be accurate[8].

Previous studies have reported significant differences in dimensions of ramus and third molar impaction, when compared to patients with normal fully erupted third molars.

The aim of the current study is to assess the gender related variations in the dimensions of Mandibular ramus and its association with impacted lower third molars.

MATERIALS AND METHOD

Following a review of the records of 430 patients seeking dental care at the dental hospital, 120 panoramic radiographs that met our inclusion criteria were chosen. The individual has to be under 21 years old, have clear panoramic photos, fully erupted mandibular teeth, and have never received or be undergoing orthodontic treatment. Based on the placement of the mandibular third molars, the patients were split into two groups:

Group impacted: 90 individuals (50 men [96 sides] and 40 women [36 sides]). The mandibular third molar's mesioangular impaction was visible on 94 sides.

Control group: 30 subjects (20 males [34 sides] and 10 women [16 sides]) in the control group, all of whom had normally erupted lower third molars.

The age of subjects ranged from 21 to 54 (mean, 27.2 ± 6.7) years.

The patients' Panoramic images were further analyzed and the Ramus Height, Ramal Width and the Condyle length were measured.

Using the SPSS statistical analysis programme, descriptive statistics for the two groups were acquired, and comparisons between the control and impacted groups were done using the Student's t-test.

RESULTS

There was considerable difference in the ramus height and width in the impacted and the fully erupted group. Men showed significantly greater values in all the parameters in both Impacted and fully erupted groups. When compared between groups, the Impacted group seems to show greater values in Ramal Height and Condyle Length. The difference is significant between the Impacted and fully erupted women. Ramal width values are almost similar.

Variable	Male	Female	p value
Ramus Height	44.45 ± 5.50	38.34 ± 3.95	0.001
Ramal Width	25.46 ± 1.97	21.34 ± 2.45	0.000
Condyle Length	14.98 ± 3.54	14.54 ± 3.63	0.056

Table 1: shows the comparison of mandibular dimensions of men and women in the impacted group

Variable	Male	Female	p value
Ramus Height	42.32 ± 4.76	39.58 ± 3.01	0.002
Ramal Width	25.87 ± 2.45	21.76 ± 2.76	0.008
Condyle Length	15.67 ± 4.64	13.75 ± 3.97	0.043

Table 2: shows the comparison of mandibular dimensions of men and women in the fully erupted group

DISCUSSION

According to the study's findings, there were numerous sex-related disparities between the impacted and control groups, with men showing higher values for most categories than women did. This agrees with the findings of Indira et al., who found that men had larger mandibular measures than women did. Additionally, it was discovered that both men and women in the control group had longer condyles and bigger total rami than those in the affected group. These results are consistent with those that have already been published[9]. (1)

Retromolar space and ramus heights were found to be significantly but barely perceptible correlated by Al-Gunaid et al. These factors may be a meaningful signal for forecasting the eruption or impaction of third molars," the authors wrote in their conclusion[10]. (2)

The likelihood of mandibular third molar impaction may be decreased with adequate mandibular development and the availability of enough room to support the third molar, which is often the final tooth to erupt [11]. In contrast to men, who continue to expand their jaws after the eruption of the third molars, women's jaw growth is thought to terminate around the time the third molars erupt, which leads to impacted mandibular third molars [12]. This may help to explain why more females than males present earlier in life. Lack of room in the alveolar arch between the distal of the second molar and the ascending ramus has been demonstrated to be the main cause of mandibular third molar failure to erupt [13]. As female mandibular growth ceases, there is less space available for the retromolars, which is a significant cause of mandibular third molar impaction. This may explain why more females present with mesioangular impaction [7]. (3)

Previous studies conducted by Obuekwe et al 2017 showed that the most common type of impaction observed was Mesioangular impaction in both males and females. They also observed a higher percentage of females exhibiting Mesioangular impaction. This is in correlation with the current study[14]. Our team has extensive knowledge and research experience that has translate into high quality publications(4–13)

CONCLUSION

Thus, it can be concluded that in comparison to the female individuals, the male subjects showed higher values for the majority of the variables. Third molar eruption or impaction may be more likely because of the sex-related mandibular ramus morphology.

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