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Dental Impactions Performed Under General Anaesthesia – A Retrospective Study on the Frequency and Implications

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ABSTRACT

The appropriate mode of anesthetic modality is one of the most important steps in planning for impacted tooth surgery. General anesthesia comes with a lot of privileges, but at the same time, it is known for its side effects. We can see a constant use of general anesthesia when multiple impacted teeth are extracted on the same day. Sometimes patients request general anesthesia because of anxiety issues. Other scenarios are when impacted teeth are placed complexly in the socket that the clinicians themselves opt for the administration of general anesthesia. The study was carried out in a university setting where we reviewed and analysed 791 patient records between June 2019 and March 2020. Ethical approval was obtained from the scientific review board. The collected data was compiled, reviewed, tabulated, and exported to SPSS software for statistical analysis. A statistically significant data was not obtained from the study, but the data has remarkable clinical significance. It is found that a slight male predilection is seen, and all the cases were done under general anesthesia when there were multiple impactions involved. Within the limitations of the study, it has been found that most of the general anesthesia administrations were done when multiple impaction surgeries were involved and more common in the second and third decade of life.

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INTRODUCTION

The majority of humans would avoid being in a situation in which they would be subjected to pain, be it mental or physical. Common dental procedures such as extraction of a faulty tooth, caries ridden tooth, etc. involve a considerable amount of pain to be inflicted in the patient during the process (Rosenberg, 2002; Kumar, 2017a). This often causes fear and anxiety in the patient's mind, which may hinder the clinician's ability to provide top notch dental care. Many studies have shown that this fear and anxiety are associated with the intraoral administration of local anesthesia which is the commonest method for blocking the nerve (Christabel *et al.*, 2016; Rao and Kumar, 2018). Hence management of pain has been one of the most pursued, both academically and clinically in the field of medicine since ancient times, particularly in dentistry (Patturaja and Pradeep, 2016; Abhinav *et al.*, 2019b).

Through the course of time, clinicians and academicians have found several chemicals, when used in a particular combination can act as pain-relieving and as desensitizing agents. These are broadly known as anesthetics (Chitre, 2010; Jesudasan *et al.*, 2015). The dosage of anesthetic combinational drugs administered on the patients can be broadly grouped into two, namely general anesthesia and local anesthesia. The former is more potent than the latter and hence it is used for a few minor and almost all major operative procedures (Kumar, 2017b,c; Abhinav *et al.*, 2019b). The point of application of both general and local anesthesia also differs greatly. The former acts on the central nervous system of the patient, thereby inducing the patient into a sleep-like state. The local anesthetic agent acts in the surrounding vicinity of the point of application of the drug that is within the regional nerve fibers (Marimuthu *et al.*, 2018; Sancho-Puchades *et al.*, 2012). General anesthesia when handled without proper expertise can cause severe damage to the neurological system, and can even lead to the death of the patient (Packiri, 2017; Patturaja and Pradeep, 2016).

Impaction of a tooth is considered to be a very common phenomenon observed in the general population (Frederick and Chu, 2003; Kumar, 2017c). Out of all the impactions, third molar impactions are found to be most common and it becomes evident in individuals between eighteen to twenty-four years of age. But there is a vast variation in the age group that shows impaction. Usually, the impaction of wisdom teeth is believed to be because of lack of space, obstruction, or abnormal position. It becomes symptomatic when the patient feels pain, swelling, or pressure (Dodson and Susarla, 2010; Kumar and Rahman, 2017).

The second most commonly seen impaction after the wisdom tooth impaction is the impaction of the maxillary canine (Shah, 1977; Kumar and Sneha, 2016; Kumar, 2017b). Canine impaction is more prominently seen in girls, almost twice as that seen in boys (Dachi and Howell, 1961). The two major theories which are associated with the impacted canines are guidance theory and genetic theory (Bishara and Ortho, 1992; Peck *et al.*, 1996; Kumar and Rahman, 2017).

Molar tooth impaction is believed to be more common nowadays than in the past. One of the main reasons behind this is considered to be a softer or tender diet that is being followed by the present generation in contrast to the relatively harder diets which were followed by our ancestors in the last century or so (Silvestri and Singh, 2003; Jain, 2019). In recent days apart from the abnormal positioning of the third molar or displacement in anatomical sites, taking also into consideration that the operative times are more prolonged and the postoperative morbidity tends to increase with the usage of general anesthesia, the choice of selecting either general anesthesia or local anesthesia is granted to the patient (Costantinides *et al.*, 2016).

MATERIALS AND METHODS

The study was carried out in a university setting and ethical approval was granted from the scientific review boards. A total of three reviewers were included. The inclusion criteria for the study chosen were the patients who had undergone general anesthesia for impacted tooth removal and the exclusion criteria were the group of patients who had undergone removal of the impacted tooth under local anesthesia. From a total of seven hundred ninety-one entries which were admitted to the university for impacted tooth removal, it was found, twenty-one patients with a total of fifty-five impactions were given general anesthesia for an impacted tooth removal. The data was retrieved through the patient management software available in the university. Tabulation of the data was done with the help of Microsoft Excel software. Statistical Product and Service Limited (SPSS) software was then used for carrying out statistical analysis on the data obtained. The method of analysis used was correlation and analysis. The independent variable used for the analysis was impaction under general anethesia and the dependent variable used were age and sex.

RESULTS AND DISCUSSION

A total of 791 impacted teeth have been removed during the study period. Of these, 55 teeth among 21 patients, needed removal of impacted teeth under general anesthesia (6.95%). (Figure 1) depicts the frequency of impactions done under general anesthesia in different age groups of patients. The range of age taken for the study was from fourteen years and above. From the analysis of the data, the highest frequency of impactions done was found to be within the age group of twenty-one to twenty-five years and the number of impactions was equal to twenty-eight. The age group of more than thirty-five years showed the next highest value with the number of impactions equal to ten. The age groups of fourteen to twenty years and twenty-six to thirty years showed the number of impactions done under general anesthesia as seven and six respectively. The lowest number of impactions done under gen-

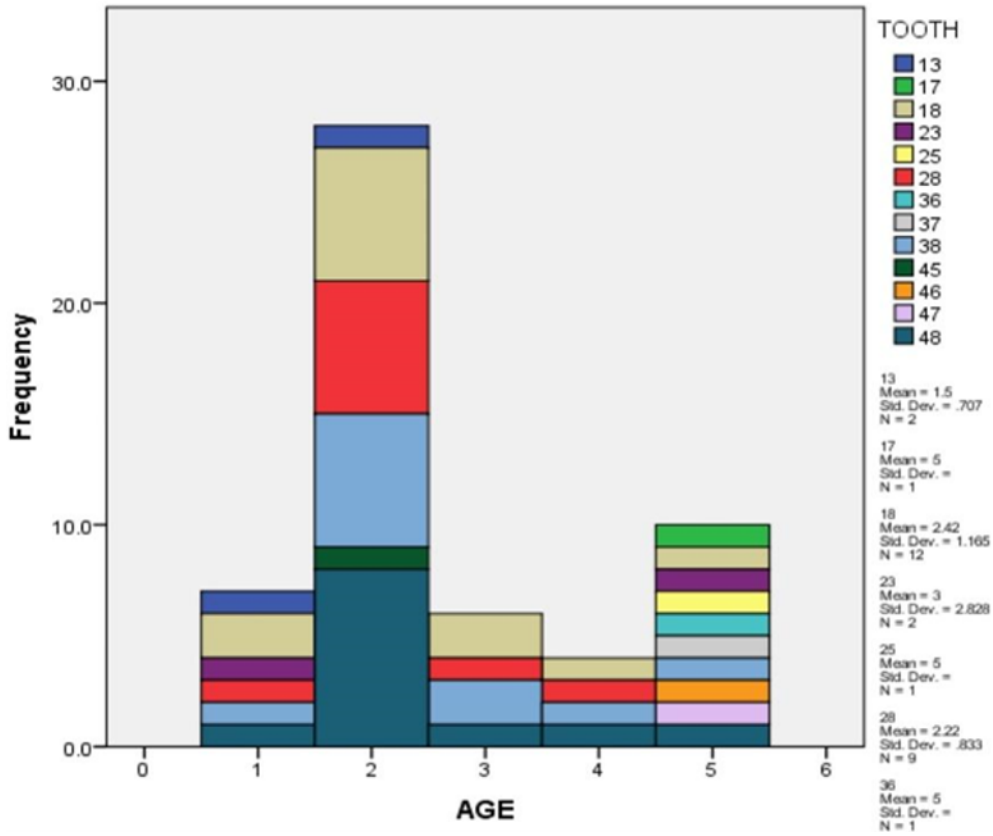

Figure 1: The bar chart represents the correlation between age and frequency of impactions

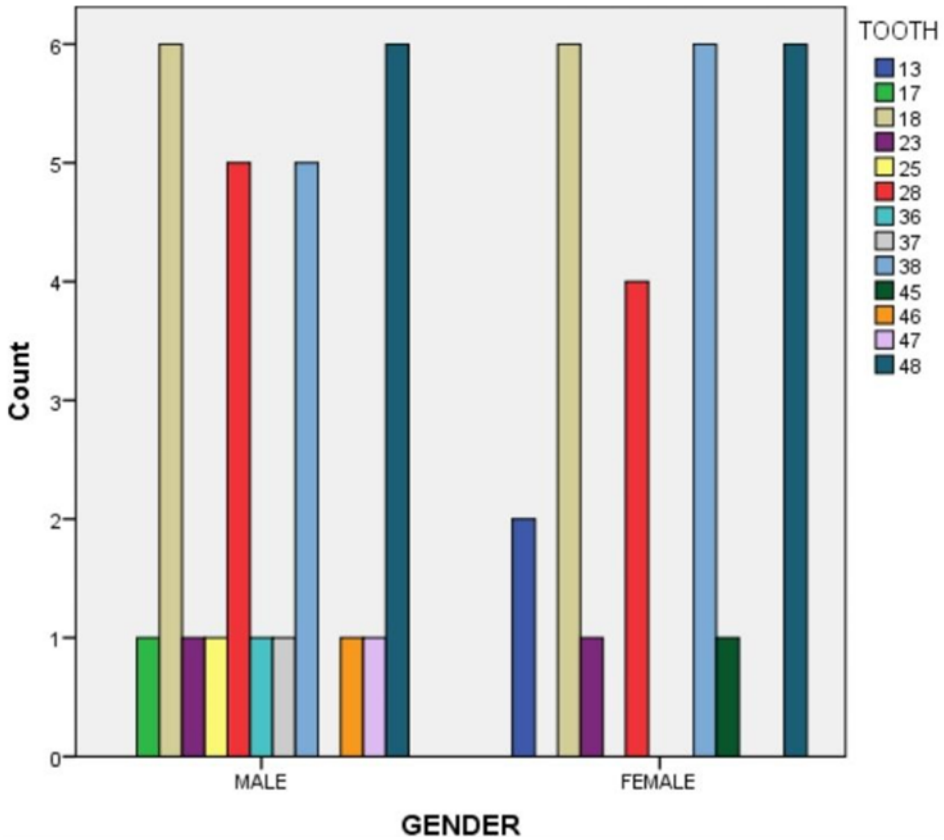

Figure 2: The bar chart shows the correlation between the number of impactions done under general anesthesia in males vs females.

eral anesthesia was found in the age group of thirty-one to thirty-five years and the count was equal to ten.

The total number of impactions done under general anesthesia for the selected age group was found to be equal to fifty-five in twenty-one patients.

Graphical data corresponding to the number of impactions done under general anesthesia in males vs females is shown in (Figure 2). Of the total fifty-five procedures done, twenty-nine impactions under general anesthesia were done for males and twenty-six procedures were done for the female study population. In both males and females, the teeth which were most impacted were maxillary right third molar and mandibular right third molar.

In the study, we observed that only a very small fraction that is only 37% of the patients reported to the college for impacted tooth removal underwent general anesthesia administration. Still, this small fraction is very significant in the clinical aspect. The study has proved that local anesthesia (93.05%) was administered to the majority of the patients than general anesthesia(6.95%). There have also been studies that have shown general anesthesia is administered to more than 50% of the total population concerned (Costantinides *et al.*, 2016). The factors which are behind this huge variation regarding the administration of local and general anesthetics are site-specific action of local anesthesia, low threat potential of local anesthesia when compared to general anesthetics and hence can be administered to patients with other serious medical issues. It is also important to note that local anesthesia is less costly than general anesthesia, hence the former is preferred by the majority of the population who belong to the middle and lower-middle-class section of the society.

Many studies have reported that the administration of local anesthesia has benefits like decreased post-operative pain, improved hemorrhage control, and reduced need of anesthesiologist intervention. In a randomized control study, it was observed that there was a significant decrease in pain following tooth extraction if local anesthesia was administered prior to the procedure (Kamath, 2013).

Sedaghatfar M et al., have found out the association between general anesthesia and neurological involvement in one hundred eighty-three patients with the prevalence of damage to the inferior alveolar nerve as 5.8% and damage to the lingual nerve as 0.3% (Sedaghatfar *et al.*, 2005). Brann et al. has also found that nerve damage was five times more frequent in tooth extractions done under general anesthesia than in local anesthesia (Brann *et al.*, 1999). According to this study, even though there is no clarity behind the cause of nerve damage, it might be due to several factors such as the supine position of the patient during administration of general anesthesia, the extent of muco-peristeal stripping and bone removal. There is also a possibility of the surgical force applied to be considerably larger in patients under general anesthesia (Patil *et al.*, 2017; Abhinav *et al.*, 2019a). None of the patients considered for our study has faced any such kind of complications.

In our study, the majority of the cases where general anesthesia was administered where there was an occurrence of multiple impacted teeth. General anesthesia was also administered in the case of an impacted canine, supernumerary tooth in relation to maxillary left second premolar, and the case of an impacted inverted right second premolar.

Edwards et al. has cited that several factors such as the difficulty level of the surgery to be conducted, the anxiety level of the patient, preference of the patient, the patients' medical history and the number of teeth to be removed play an important role in choosing the appropriate anesthetic modality (Edwards, 1999; Costantinides *et al.*, 2009).

In the study conducted, it was observed that a slight male preponderance was seen in the case of the presence of impacted teeth. In a study conducted by Al-Zoubi et al., the presence of impacted teeth was more when compared to females (Al-Zoubi *et al.*, 2017). But in a study conducted by Enabulele et al., they have observed a female predilection in the case of impacted third molars (Enabulele and Obuekwe, 2017).

CONCLUSION

Within the limitations of the study, it was observed that removal of impacted teeth was preferred mostly under local anesthesia. When done under general anesthesia, there was a slight male predominance and involvement of multiple impacted teeth. From our study, it has become evident that general anesthesia administration is advised when multiple impactions are involved. The possible reasons for not advising general anesthesia are, the complications post-surgery such as inferior alveolar nerve damage, lingual nerve damage, etc. and to not burden the patients from the lower sections of the society with the high cost associated with general anesthetic procedures.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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