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Prevalence of Children Below 3 Years of Age Undergoing General Anaesthesia for Dental Treatment

AUTHORS (WITH AFFILIATION):

1-Neha N

Undergraduate Student
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University,
Chennai,
Tamil Nadu, India.
Email id: 151801091.sdc@saveetha.com

2- Dr. Lavanya Govindaraju

Senior Lecturer
Department of Paediatric Dentistry
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University,
Chennai,
Tamil Nadu, India.
Email id: glaavuu@gmail.com

3. Dr.Ganesh Jeevanandan

Reader
Department of Paediatric Dentistry
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University,
Chennai,
Tamil Nadu, India.
Email id:helloganz@gmail.com

ABSTRACT:

Introduction: The management of anxiety and pain and gaining cooperation from the child are the crucial aspects of paediatric dentistry. This leads to the utilisation of sedation, local anaesthesia and general anaesthesia during dental procedures. The number of children who get their dental rehabilitation pediatric under General Anesthesia is on a constant rise in the recent times. Treatment under GA is also found to be a trend among the paediatric dentists. Treatment under GA is associated with its own unique benefits as well as complications.

Aim: This study aims to assess the prevalence of children below 3 years of age undergoing general anaesthesia for dental procedures in a hospital setting.

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Materials and methods: This study was conducted in Saveetha dental college, a private dental institution in Chennai. The patient details of the Department of Paediatric dentistry were collected from the Hospital Management system. 267 patients who were suitable for the inclusion criteria were selected for the study. The data was tabulated in Microsoft Excel sheet and data analysis was performed using SPSS software version 23.

Results: Out of the 267 paediatric patients who underwent General anaesthesia for dental procedures, 108 children were belonging to the age group of 0-3 years. The results reveal that about 40% of the total patients requiring general anaesthesia for dental procedures were children under 3 years of age.

Conclusion: Although the use of general anaesthesia in children below 3 years of age is accompanied by its adverse effects, it is still being carried out at a higher rate, since demanding cooperation from infants is a challenging task.

Key words: General anaesthesia, children, paediatric dentistry, dental treatment, model analysis

INTRODUCTION:

The use of general anaesthesia for dental procedures is a very common practice in paediatric dentistry. Children below 3 years of age are unable to distinguish between pain, pressure and vibration(1). They lack the ability to understand and respond to the clinician's explanations. Thus, it is difficult for them to undertake dental treatment under local anaesthesia.

A child's perception of pain is relative to cognitive development(2). Chair side behaviour management techniques are frequently applied and yield successful results in most of the child populations. Yet, there are few children, who cannot subsist to usual behaviour management techniques(3). The child's ability to cope up with dental treatment depends on various factors which includes Anxiety and Fear, previous traumatic experiences(4). Dental treatment under general anesthesia (GA) is the only form of rehabilitation for such children in need of dental treatments.(5)

GA is a controlled state of unconsciousness in which the whole body goes to sleep and the child's protective reflexes are lost(6). Extensive dental treatment under GA has been successfully offered to children for the past 4 decades.(7) The American Academy of Pediatric Dentistry (AAPD), advocates dental treatment under GA for children who are very young, or those with any sort of immaturity or disability; highly anxious patients and those who need extensive rehabilitation may not cooperate and tolerate in routine in-office dental treatment.(8)(9).

General anaesthesia can be administered by IM, IV, rectal, oral and inhalation routes. Due to the fear of injections, inhalation is usually the preferred route in children(10). Halogenated volatile anesthetics are more frequently used; these include nitrous oxide, isoflurane, desflurane and sevoflurane. Sevoflurane is the induction agent of choice due to its pleasant odours, less chances to induce hypotension and respiratory problems(11).

The use of GA is paired up with its own advantages and disadvantages. Advantages include that all treatments can be performed in a single day in a safe environment(12). GA does not require cooperation from the child during dental treatment; making dental treatment easy in a highly anxious and non-cooperative child. It ensures that the child has received treatment with a painless approach(13). This will help them to have a good dental experience and will not instill fear towards future dental treatments; thereby improving quality of life(14). On the other hand, the use of GA is also associated with disadvantages and complications. Minor complications of the use of GA in children include postoperative headache, nausea, retching, vomiting, sore throat and cough. Major complications include damage to the lip, soft tissues and teeth adjacent to the operative site, pain due to forceful or incorrect use of mouth openers and complete respiratory obstruction from inhalation of foreign material(15). Iatrogenic injuries to the neck can occur as a result of mishaps during intraoperative positioning, as it may cause dislocation of the temporomandibular joint(16). Although the advantages of treating a child under GA outweigh the disadvantages, it is recommended that the pediatric dentists limit dental treatment using GA, only in extreme and uncontrolled situations(16).

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Thus, it is important for dental students and clinicians to have a thorough knowledge on the usage of GA in children, its associated advantages, disadvantages and the incidence of it being used for dental treatment. This study aims for that purpose; to find and educate the dental practitioners about the prevalence of using GA for dental procedures in children below 3 years of age.

Our team has extensive knowledge and research experience that has translate into high quality publications(17–29)(30–36)

MATERIALS AND METHODS:

This is a retrospective study conducted in Saveetha Dental College, Chennai. The out-patient details of the Department of Paediatric dentistry were collected from the hospital management system. Out of the total out-patient population analysed, 267 paediatric patients who underwent general anaesthesia in the past 1 year were included in the study and further classified based on their age group. The details of children who fulfilled the criteria for the age group of less than 3 years were derived. All the case sheets were reviewed and verified by another examiner. The data was collected and tabulated in Microsoft Excel sheet under the following parameters: name, age and gender. The data analysis was performed using SPSS software version 23. Chi square test was performed and the number of patients were plotted against age group and gender.

RESULTS:

Out of the 267 patients of 0-17 years of age who underwent GA in the past 1 year in the Department of Pedodontics, 108 patients belonged to the age group of 0-3 years (Figure 1). The age and gender distribution of the same is shown in Figure 2

DISCUSSION:

The present study assessed the prevalence of children less than 3 years of age undergoing general anaesthesia for dental treatment. The results reveal that 40% of the total population comprises the age group 0-3 years. In this, a higher count was observed in children of 3 years and less than 1 year of age. Another finding was gender prevalence. Out of 108 children, 54% were females and 46% were male subjects who underwent GA.

In a study conducted by Alcaino et.al., it was observed that an increasing number of children underwent GA for dental procedures. A majority of these were the children of prekindergarten age and those who need more treatment procedures which is similar to the results of the present study. Although some of these children initially accepted the dental treatment, eventually led to the use of general anaesthesia in later appointments. This justifies the use of dental rehabilitation under GA.(37)

Goodwin et.al. in 2015 stated that though the dental treatment under general anaesthesia is safe and comfortable, any anesthetic agents can cause some sort of risk to the patient's overall health and hence the pediatric dentists should opt for dental treatment using GA only as a last option.(38)

Eshghi et.al. in their study stated that arrhythmias, obstruction of the endotracheal tube, IV infiltrates or disconnects, edema of the tongue or lips and nasal bleeding are the other few intraoperative complications that can occur while treating the children under GA(39). Also inexperienced personnel, inadequate equipments may lead to adverse events which could also cause death of the child when treated with GA. Hence, following correct technique, standard guidelines and participating in training courses could help to maintain and improve skills, decrease the probability of such unwanted events and eliminate it.(40)

From the articles discussed above, we derive that General anaesthesia is a modality that has its unique benefits and is also associated with many risk factors. Hence, the clinician should be able to decide and make a proper clinical judgement based on the condition of the infant and treatment that has to be carried out.

CONCLUSION:

Within the limits of the present study, it was found that 40% of the children less than 3 years of age underwent dental treatment under general anesthesia.

More emphasis on creating awareness of maintaining the oral hygiene of the children should be conducted.

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CONFLICT OF INTEREST: Nil

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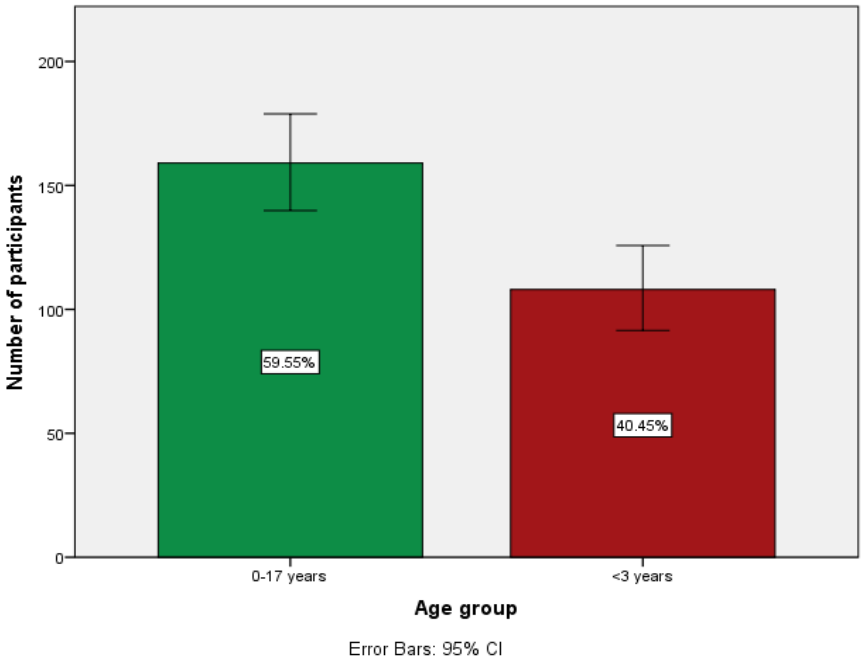

Figure 1: Total number of paediatric patients of age 0-17 years who underwent General anaesthesia and number of children of 0-3 years of age who underwent General anaesthesia.

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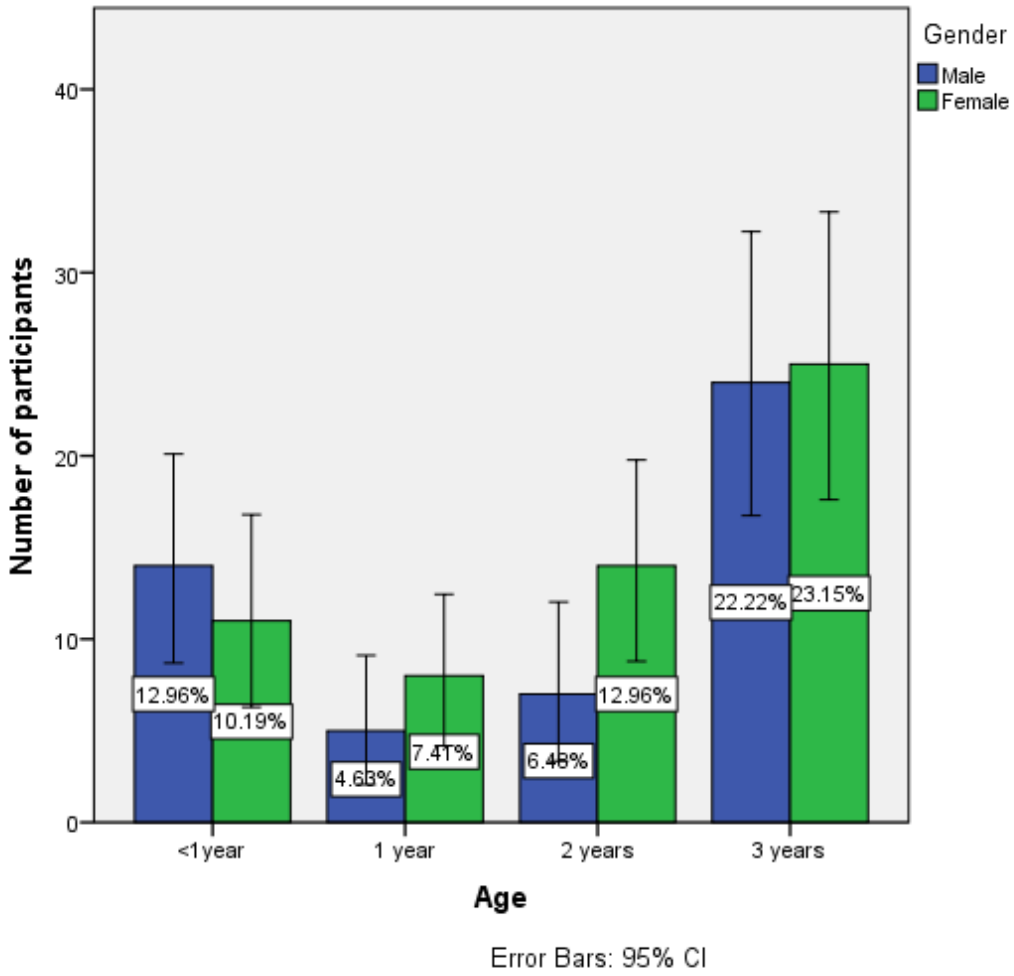

Figure 2: Age and gender of children against the total count.

This graph shows association between the age and gender of children undergoing GA for dental procedures. The blue bar represents females and the green bar represents males. This association was done by performing Chi square test which showed a p value of 0.41 (>0.05), which indicates that the difference between the two groups was statistically insignificant.