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Weight of children treated under general anaesthesia for dental rehabilitation: A retrospective study

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Abstract---Background: A big clinical challenge is performing dental treatments on paediatric patients who have behavioural problems. Management of such cases depends entirely on their emotional maturity along with their physical, psychological and mental skills. For them, the usual management techniques may be inadequate and may not be safe during dental procedures. An important factor to consider while administering a management method such as general anaesthesia is the weight of the patient. Being overweight or having a BMI level above the ideal range, can increase the risk during surgery. Not having weight in the ideal range leads to challenges with many anaesthesia related procedures. Aim: To collect data and analyze the body weight of children being treated under general anaesthesia,

relating to their age and gender. **Materials and Methods:** The retrospective study was conducted in a private dental college, Chennai, India. Data was collected from the records of the children less than 12 years of age who were treated under general anaesthesia between September 2020 and February 2021. A total of 128 children who were treated under general anaesthesia were included in the study. Data was collected with parameters like age, gender and weight of the patient. The collected data was analyzed using SPSS statistical software. Data analysis was done using chi square test and p value was set as 0.05 as level of significance. **Results:** Among the 128 pediatric patients, 89.84% are in the age group 0-5, 7.13% are in the age group 6-10 and 3.13% are between 11-15. 51.56% of them are females and the rest 48.44% are males. The body weight of these patients was categorised as 5-10 kgs, 10-15 kgs, 15-20 kgs, 20-25 kgs, 25-30 kgs, 30-35 kgs, 35-40 kgs, 40-45 kgs, 45-50 kgs, 50-55 kgs, 55-60 kgs and 60-65 kgs. Data reveals that, 8.59% are in the 5-10 kgs group, 43.75% are in the 10-15 kgs group, 33.59% are in the 15-20 range, 10.16% are in the 20-25 group, 0.78% are in the 25-30 group, 0.78% are in the 30-35 group, 0.78% are in the 35-40 kgs group, 0.78% in the 50-55 range and 0.78% are in the 60-65 kgs range. **Conclusion:** Body weight is a very important factor to consider while administering general anaesthesia in a pediatric patient. It may lead to complications and the life of the patient may be at risk. In order to prevent such an occurrence, all factors must be ideal and the BMI must be in the normal range.

Keywords---Body weight, pediatric patients, general anaesthesia, novel analysis.

Introduction

Dental caries is still a global public health problem, that too prevailing in pediatric patients. However, there has been a decline in the prevalence in children in many parts of the world(1). If left untreated, pain and infection are severe manifestations of dental caries(2). Moreover, dental caries have been shown to cause detrimental changes in the children's nutrition, growth and development(3). There have been studies which have associated dental caries with the BMI of the children. A BMI outside of the normal range, may it be lower or higher has been considered as a risk factor as well as an outcome of dental caries(4)(5).

Simple behaviour modification techniques such as “tell, show and do” are usually used in a flourishing way with children under local anaesthesia in the majority of children(6). However, some children do not respond to such changes and require alternative anxiety and pain management techniques in order for the entire procedure to be completed effectively(7). This group involves patients with considerable dental decay as well as highly anxious and scared children who are not able to cooperate with the demand of the treatment(8). In such instances, administering general anaesthetic is a fairly efficient procedure because it only involves one appointment and little to no cooperation from the patient. The use of

GA leads in total relaxation and limited remembrance of the process(9)(10). Nevertheless, it is used only as a last resort because general anaesthesia may pose risks for the patient's overall health(11).

Weight plays an important role in the treatment of pediatric patients under general anaesthesia. Being overweight or having a BMI level above the ideal range, can increase the risk during surgery(12). Being overweight leads to challenges with many anaesthesia related procedures. These include locating veins for the delivery of anaesthesia along with medication injected intravenously for life saving emergencies. It also includes ensuring that the patient has enough oxygen and airflow, especially in situations where they are diagnosed with sleep apnea, where it takes extra time to regain consciousness after the surgery, which in turn increases the risk of pulmonary problems with narcotics and other pain medicines(13)(14).

In adults, low body mass index can be caused by malnutrition, underlying health disorders such as cancer, and psychological factors. The word 'low body weight' refers to a person's weight being low, whereas the term 'underweight' usually refers to a person's weight being low for their height (BMI < 18.5 kg m²). The aim of the present study is to collect data and analyse the body weight of children being treated under general anaesthesia, relating to their age and gender.

Materials and Methods

The retrospective study was conducted in a private dental college, Chennai, India. Ethical approval was obtained from the Institutional review board prior to the start of the study. Data was collected from the records of the children less than 12 years of age who were treated under general anaesthesia between September 2020 and February 2021. A total of 128 children who were treated under general anaesthesia were included in the study. Data was collected with parameters like age, gender and weight of the patient. The collected data was divided into 3 age groups as 0-5, 6-10 and 11-15 years and was analysed using SPSS statistical software. Data analysis was done using chi square test and p value was set as 0.05 as level of significance.

Results

A total of 128 children with the mean age of 4.15±1.32 were included for analysis in the present study. The demographic details of the participants are tabulated in Table 1. A majority of the children (43.75%) were within the range of 10-15 Kgs. (Figure 1) Association of the weight with age and gender showed insignificant results (Figure 2 &3).

Table 1
Shows the mean age and gender distribution of the pediatric patients

Age	4.15±1.32 years
Gender	Females : 51.56% Males : 48.44%

Figure 1. Shows the range of body weight of the patients. (8.59% are in the 5-10 kgs group, 43.75% are in the 10-15 kgs group, 33.59% are in the 15-20 range, 10.16% are in the 20-25 group, 0.78% are in the 25-30 group, 0.78% are in the 30-35 group, 0.78% are in the 35-40 kgs group, 0.78% in the 50-55 range and 0.78% are in the 60-65 kgs range)

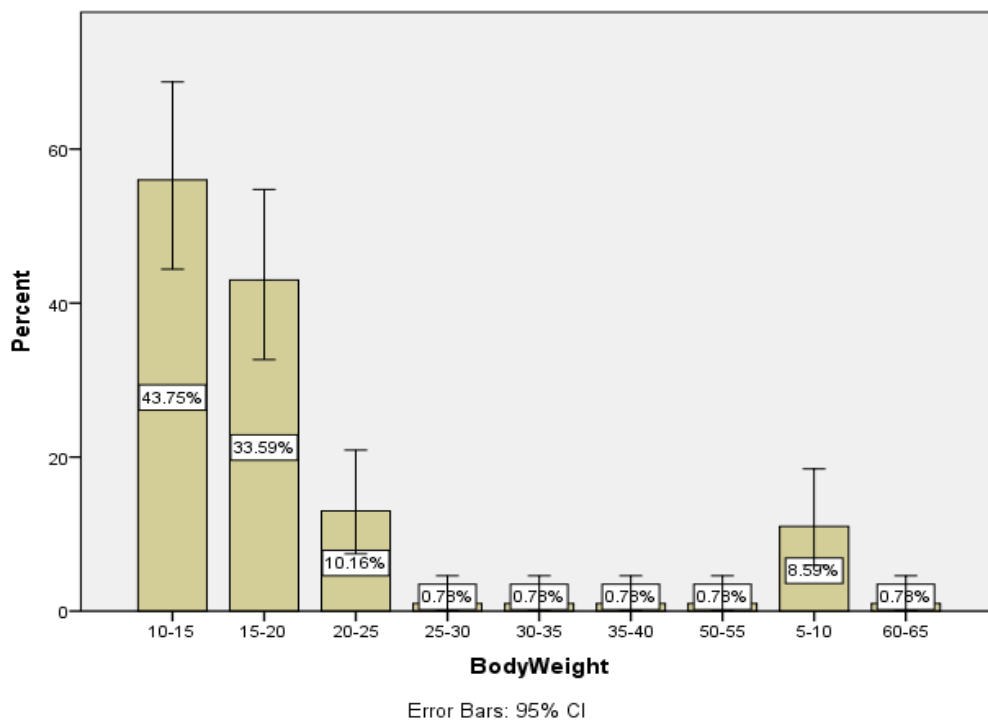


Figure 2. Bar chart representing association between age and body weight of the pediatric patients. X axis represents the age of patients and Y axis represents body weight of the participants. Association between age and body weight was done using Chi square test (chi square value = 1.276, P value = 0.259) and was found to be statistically insignificant.

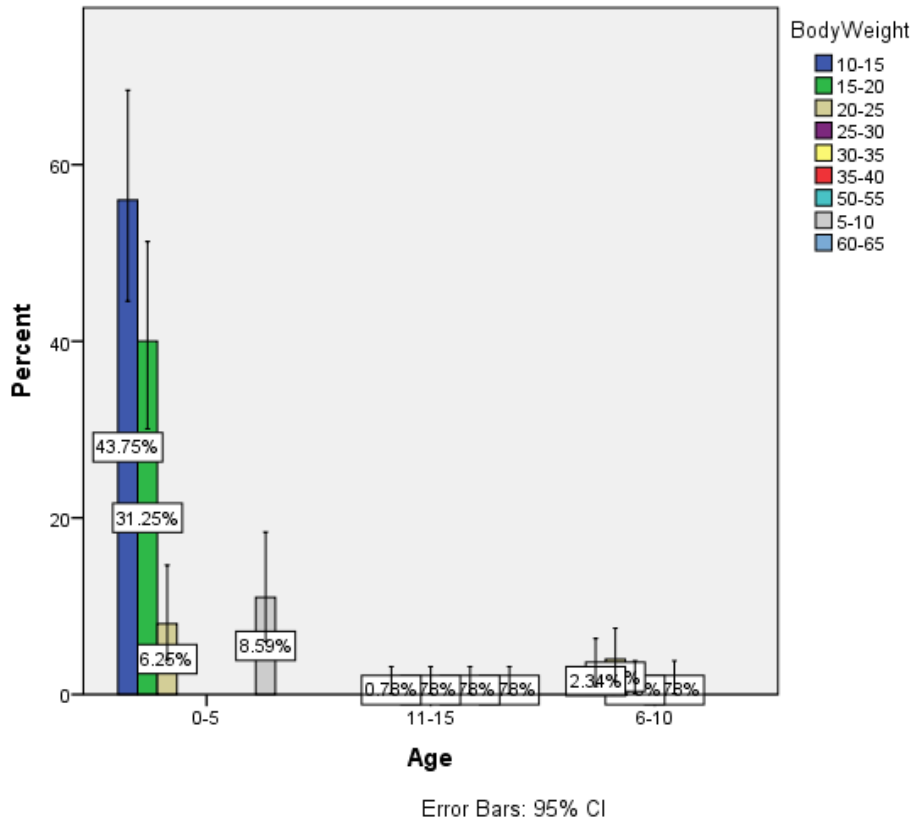
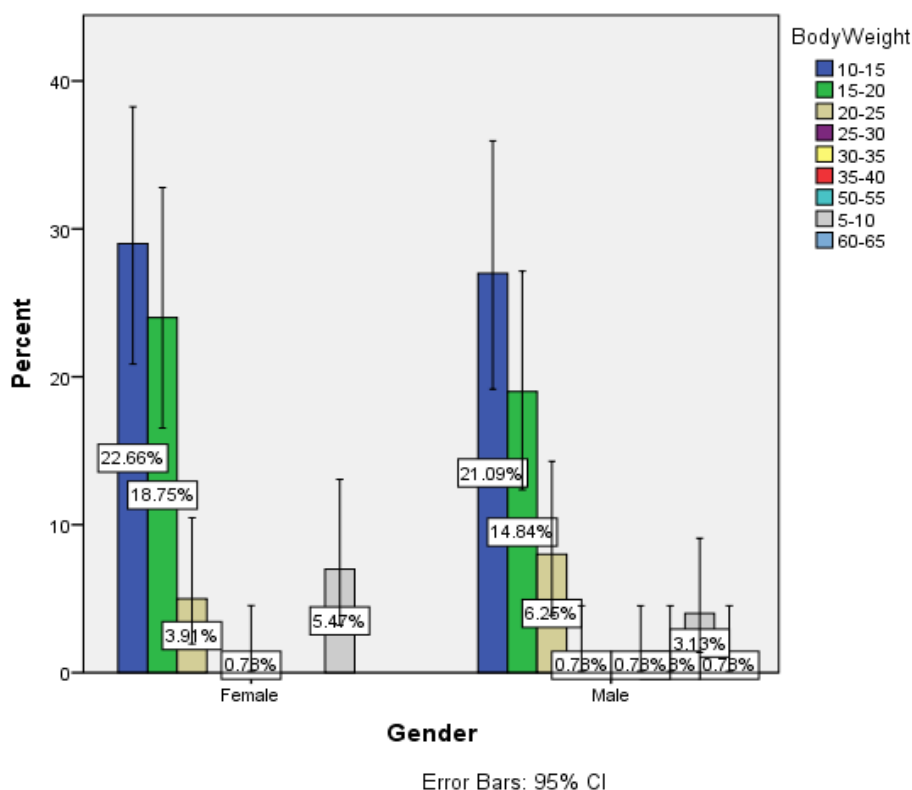


Figure 3. Bar chart representing association between gender and body weight of the pediatric patients. X axis represents gender of patients and Y axis represents body weight of the participants. Association between gender and body weight was done using Chi square test (chi square value = 7.045, P value = 0.532) and was found to be statistically insignificant.



Discussion

The present study reveals that out of 128 patients, the majority of the pediatric patients treated under general anaesthesia were females belonging to the age group of 0-5 years of age. This is because young toddlers are known to have 'white coat phobia' and so, present as the most restless patients, with anxiety and bouts of screaming and shouting. Their behaviour management serves as a challenge for all medical practitioners. The normal range for body weight that is safe to be treated under general anaesthesia is BMI of less than 25 kg/m². Weight is a very important factor to be considered and assessed before administering GA. Being either underweight or overweight can have many complications which may cause fatalities. Hence, checking and recording the weight and height, consequently calculating the BMI of the pediatric patient is necessary. Some studies say that it is as necessary as enquiring about the patient's comorbidities and past history.

Obesity is increasing throughout the world. Along with that, surgical procedures in such patients are also increasing. Obese patients are at a higher risk to anesthesia related complications when compared to patients in the normal weight range(15). Obese patients are more prone to diseases such as Postoperative atelectasis and sleep apnea syndrome when compared to their normal counterpart(16). Thromboembolism is another important complication that can be seen in obese patient. This patient population has elevated risk of perioperative mortality and morbidity(17). Obese patients should be extensively assessed for any medical issues before undergoing any elective surgery, as they have a higher risk of perioperative death. Because anesthesiologists will experience more obese patients in the future, they will require a more thorough understanding of the challenges that obesity poses during anaesthetic treatments. In order to avoid difficulties and make the treatments less stressful, they will need to adopt more preventive steps for the patients(18)(19).

One aspect of this study is to evaluate the weight of patients and correlate it with the complications. Another approach is to counsel the patients and to impart knowledge about the consequences and difficulties that they might face due to their increased weight. Nutritional counselling along with mental and physical guidance is an integral part of the solution to such cases. Our team has extensive knowledge and research experience that has translate into high quality publications(20–32)(33–39)

Conclusion

With the majority of the children undergoing dental treatment under general anesthesia being 0-5 years, they were mostly between the ranges of 10- 20kgs.

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Conflict of Interest

The authors declare that there were no conflicts of interest in the present study.

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