

Pre Anesthetic Instructions Given for Children Treated Under General Anesthesia

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ABSTRACT:

INTRODUCTION: Pre-anesthesia fasting guidelines apply to any procedure that makes use of sedative medications to reduce the protective airway reflex which under normal conditions prevents aspiration. Pre-operative fasting guidelines have been developed by anesthesia societies with almost all following a variant of the “2-4-6-8 rule”. However recent literature emphasises on minimising the fasting time to one hour for clear fluids in children.

AIM: To find the association between the NPO instructions among different age groups and gender in children who underwent treatment under general anesthesia in an institutional setting.

MATERIALS AND METHOD: This is a single centered retrospective study. The data was collected from the dental hospital management system. The patient details were analysed between January 2020 to February 2021 out of which 145

fulfilled the inclusion and the exclusion criteria, and 62 subjects who fulfilled the inclusion criteria were included in the study. The data was statistically analysed using SPSS software version 23.

RESULTS AND DISCUSSION: In the present study, females (35.48%) have been given a higher percentage of NPO instructions for 6-8 hours than males (25.81%) and providing subjects among 3-5 years (15.09%) of age have been given a higher percentage of NPO instructions for 6-8 hours than other age groups.

CONCLUSION: Within the limits of the study, it can be concluded that a higher percentage for 6-8 hours NPO instructions were practiced for children undergoing dental treatment under general anesthesia.

Key words: Clear fluids; Fasting; General anesthesia; NPO; Novel analysis.

INTRODUCTION:

The most important pre-anesthetic instructions given to children treated under general anesthesia are pre-operative fasting guidelines. Recent nil per os (NPO) guidelines advocates pre-operative fasting as an essential instruction. NPO instructions have been established to prevent pulmonary aspiration when the protective airway or laryngeal reflex is impacted due to general anesthesia(1). Fasting guidelines apply to any procedure that makes use of sedatives(2). Regurgitation and aspiration of the gastric contents is a potential risk in patients undergoing treatment under general anesthesia.

Pre-operative fasting guidelines were developed by the anesthesia societies on basis of a “2-4-6-8 rule” which implies fasting for 8 hours in case of fatty food or meats, 6 hours for solid foods, 4 hours in case of breast milk, and 2 hours for clear liquids for pediatric patients treated under general anesthesia to prevent regurgitation and pulmonary aspiration(3).

NPO instructions are informed to the family verbally or in written preoperative sheets at the time of surgical consultation, that is one day prior to the procedure by an operating team member, or during a preoperative visit(4).

Studies reveal dehydration, anxiety, postoperative nausea and vomiting, hypoglycemia, and hypovolemia, as the most common complications due to prolonged fluid fasting(5). To minimize the metabolic and behavioral effects of prolonged fasting in pediatric patients, there has been recent literature on minimizing the fasting time to one hour for consumption of clear fluids(6).

However, some parents tend to fail in complying with the NPO instructions due to inadequate understanding of its necessity, pressure to feed their hungry and crying child, willful distortion of certain facts to prevent cancellation of the procedure, and conflicting instructions given by more than one person or source(7). Additionally, language barriers too influence the rate of NPO violations due to inadequate understanding of the guidelines.

The rate of cancellations or delays for treatment under general anesthesia on the day of the procedure is reported to be 18%. Such cancellations can lead to economic and emotional impacts on the patients and their families, and on the overall health care costs and efficiency(8).

In order to prevent such impacts, it is very much essential to give proper pre-anesthetic NPO guidelines to the parents and the patient who is undertaking the treatment under general anesthesia verbally and in written preoperative instructions sheets at the time of the surgical consultation and get their written consent to prevent cancellations on the day of the procedure.

Our team has extensive knowledge and experience in various research aspects which has been translated into high-quality publications(9–21)(22–28).

Hence, this present study aims to find the association between the NPO instructions given among different age groups and gender in children below 14 years of age who underwent treatment under general anesthesia in an institutional setting.

MATERIALS AND METHODOLOGY:

This present study is a retrospective study that has been conducted in a single centered private dental institution, Chennai. The data required for the study was collected from the dental hospital management system. The details of the patients who reported to the pediatric dentistry department for treatment under general anesthesia were analyzed between January 2020 to February 2021 out of which 145 pediatric patients fulfilled the inclusion and the exclusion criteria. The inclusion criteria were gender, subjects below 14 years of age, and the exclusion criteria were subjects above 14 years of age. 62 subjects cleared the set inclusion criteria. Ethical clearance was obtained from the Institution review board.

The case sheets of all the subjects were cross-verified by another examiner. The data were tabulated under the following parameters: Gender, Age, and NPO instructions. Statistical analysis of the data was done using Version 23 of SPSS software. Chi-Square test and Pearson correlation were done and a p-value which was less than 0.05 was considered as statistically significant.

RESULTS:

A total of 62 pediatric patients who got their treatment done under general anesthesia were included for analysis in the study. The mean age of the patients was 3.12 ± 2.39 years. The demography of the subjects is tabulated in Table 1. 61.29% of the subjects were advised for 6-8 hours NPO. (Figure 1) Association between the NPO and gender did not show a statistically significant difference whereas a significant difference was noted with age. (Figure 2 and 3).

In the female population, 9.68% of the subjects were given NPO for 3-5 hours, 35.48% were given NPO for 6-8 hours, and 11.29% were given NPO for 10-12 hours. In the male population, 9.68% of the subjects were given NPO for 3-5 hours, 25.81% were given NPO for 6-8 hours, and 8.06% were given NPO for 10-12 hours. In the 0-2 years age group, 16.13% of the subjects were given NPO for 6-8 hours. In the 3-5 years age group, 1.61% of the subjects were given NPO for 3-5 hours, 43.55% were given NPO for 6-8 hours, 12.90% were given NPO for 10-12 hours. In the 6-8 years age group, 1.61% of the subjects were given NPO for 6-8 hours, and 10-12 hours respectively. In the 9-11 years age group, 1.61% of the subjects were given NPO for 3-5 hours, and 10-12 hours respectively. In the 12-14 years age group, 1.61% of the subjects were given NPO for 3-5 hours.

DISCUSSION:

The results from the present study states that out of 62 children, 35.48% of the females and 25.81% of the males underwent NPO for 6-8 hours, 9.68% of both the females and males underwent NPO for 3-5 hours, 11.29% of the females and 8.06% of the males underwent NPO for 10-12 hours.

The present study reveals that, in the 3-5 years age group, 43.55% were given NPO for 6-8 hours, 12.90% were given NPO for 10-12 hours and 1.61% were given NPO for 3-5 hours. In the 6-8 years age group 1.61% were given NPO for 6-8 hours and 10-12 hours respectively. In the 9-11 years age group 1.61% were given NPO for 3-5 hours and 10-12 hours respectively. In the 12-14 years age group 1.61% were given NPO for 3-5 hours and in the 0-2 years age group 16.13% were given NPO for 6-8 hours and 3.23% were given NPO for 10-12 hours.

In the present study, subjects between 3-5 years (43.55%) of age have been given a higher percentage of NPO instructions for 6-8 hours than other age groups. In a prospective cross-sectional study conducted by Du et al., 2017, found that there was complete clearance of clear liquids after 90 minutes of ingestion in 8- to 14-year-old children. (29).

Okabe et al., in 2015 examined whether or not the caloric content of the food determined gastric emptying and found no significant differences in gastric emptying time of equal volumes of non-human milk and diluted pulp free orange juice liquids even after drinking an equal number of calories. Okabe et al. also suggested that consumption of beverages which do not exceed 220 kcal can be cleared in less than two hours. Hence, he concluded that the gastric emptying of liquid foods depends primarily on the total caloric value rather than the type of liquid consumed (30).

A retrospective study by Andersson et al. in 10,015 pediatric patients, who were allowed to consume unlimited clear fluids till surgery with the only objective to determine the incidence of pulmonary aspiration associated with treatment under general anesthesia found that the incidence was seen in 3 out of 10,000 subjects with an unrestricted fluid intake prior to the procedure. Also, in those 3 cases of pulmonary aspiration, the patients did not require any kind of postoperative intensive care or ventilatory support. Decline in the symptoms was noticed in a day following the surgery, without any postoperative sequelae and after treatment with the appropriate antibiotics(31).

Prolonged fasting can cause dehydration, post-operative nausea, and vomiting with a poor patient experience. Hence, clinicians must follow the Royal College of Dental Surgeons of Ontario (RCDSO) standard and clinicians must make sure that patients are under enough clear fluids until two hours prior to the surgery with sedation or general anesthesia to achieve the best balance between providing positive outcomes and minimizing the potential risks(32).

The limitation of the present study was the lack of data about the NPO instructions given to the children based on the type of food, however, this study helps the scientists and researchers to work on minimizing the fasting period with respect to fluids to prevent dehydration and hypoglycemia.

CONCLUSION:

Within the limits of the study, it can be concluded that 6-8 hours of NPO is the most commonly practiced method in children treated under general anesthesia.

It is essential to give proper pre-anesthetic NPO guidelines to the parents and the patient who is undertaking the treatment under general anesthesia verbally and in written pre-operative instructions sheets at the time of the surgical consultation and get their written consent to prevent cancellations on the day of the procedure.

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CONFLICT OF INTEREST:

No potential conflict of interest relevant to this article was reported.

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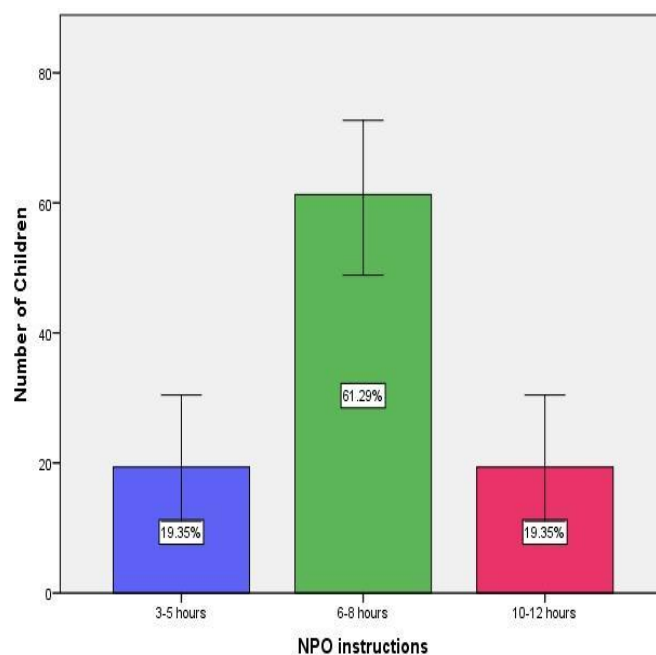


Figure 1: Bar graph shows the percentage distribution of NPO instructions, wherein blue color denotes NPO for 3-5 hours (19.35%), green color denotes NPO for 6-8 hours (61.29%), and pink color denotes NPO for 10-12 hours (19.35%).

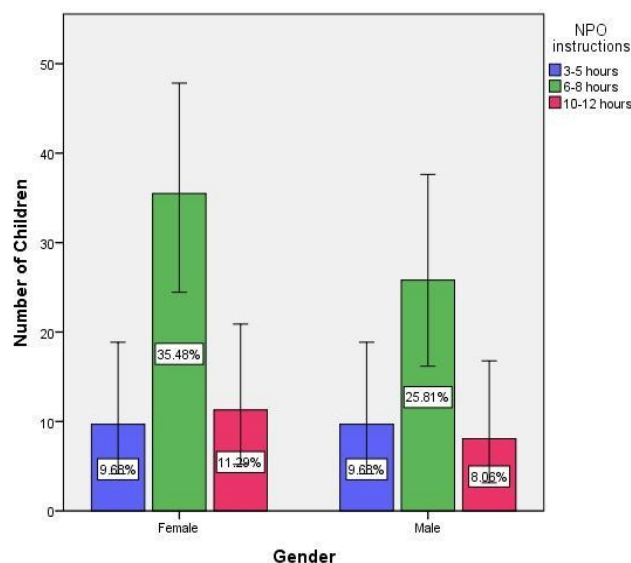


Figure 2: Bar chart representing the association between the gender and NPO instructions given to the pediatric patients treated under general anesthesia. The X-axis indicates the gender and the Y-axis indicates the NPO instructions. Chi-square test was done and the association between the gender and NPO instructions was found to be not statistically significant with Pearson's chi-square value: 0.253, df: 2, p-value: 0.881 ($p > 0.05$). Hence, the association is statistically not significant, suggesting females (35.48%) have been given a higher percentage of NPO instructions for 6-8 hours than males (25.81%).

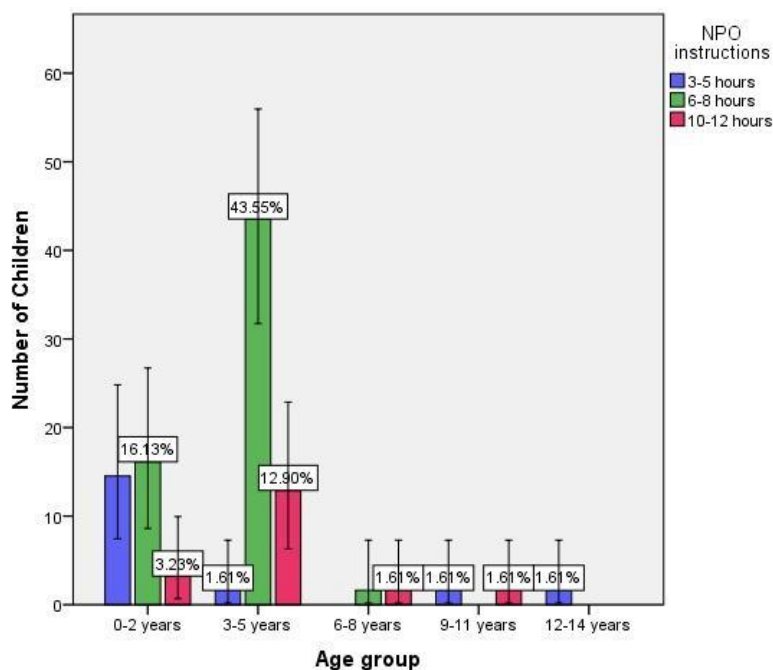


Figure 3: Bar chart representing the association between the age group and the NPO instructions given to the pediatric patients treated under general anesthesia. The X-axis indicates the age group and the Y-axis indicates the NPO instructions in children treated under general anesthesia. Chi-square test was done and the association between the age group and NPO instructions was found to be statistically significant with Pearson's chi-square value: 22.783, df: 8, p-value: 0.004 ($p < 0.05$). Hence, the association was statistically significant, suggesting subjects among 3-5 years (43.55%) of age have been given a higher percentage of NPO instructions for 6-8 hours than other age groups.

Table 1: The table represents the total number of subjects included in the study, percentage distribution of their gender, and the mean value of their age.

Total	N= 62	
Gender	Male	43.55% (n=27)
	Female	56.45% (n=35)
Age	Mean \pm Standard deviation	3.12 \pm 2.39 years