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PREOPERATIVE FASTING AMOUNTING TO DEHYDRATION IN PEDIATRICS AGE GROUP- AN OBSERVATIONAL STUDY

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ABSTRACT **Introduction:** Pre-preoperative fasting, a universally practiced principle in elective cases helps to reduce the risk of pulmonary aspiration of gastric contents. Prolonged fasting for 8-10 hours has been practiced at various places to avoid complications like Mendelson's Syndrome and Aspiration Pneumonia. However, prolonged fasting may be an unpleasant experience causing distress, irritability, dehydration and hypoglycemia especially in pediatric patients. Studies have reported many children end up fasting for up to 12 or 15 hours inspite of recommended 6-4-2 guidelines, leading to side-effects like, hypoglycemia, metabolic acidosis, dehydration.In this study, we tried to acertain the dehydration status due to various reasons and also suggested a solution for the same. **Aims** To assess the dehydration status of pediatric patient based on clinical dehydration scale. **Objectives:**(1) To asses the complaints of paient suggesting dehydration on well designed proforma.(2) To asses amount of dehydartion according to dryness of mucous membranes by using finger print impression **Materials And Methods:** This randomised trial was conducted on 100 NBM paediatric patients in age group of 0-14 yrs at Dr. D.Y.Patil Medical College ,Pune. Time at which the patient was wheeled into operation theater, duration of preoperative fasting was noted ,calculated, analyzed and compared. The tongue was assessed to find the degree of hydration with help of finger impression from moist tongue on parchment paper and scoring was given as follows: Scoring:5- almost full finger impression,3- half finger impression and 1-No finger impression. **Result:** The finger impression test was, No impression (score=1) in 40 patients, half finger impression (score=3) in 37 patients and almost full finger impression (score =5) in 23 patients. **Conclusion:** Fasting time for pediatric patients in our study were typically far longer than current guidelines. This can be attributed to surgery timings of previous patients inside the theatre leading to prolonged fasting time.

KEYWORDS : moist tongue, thumb impression, dehydration , NBM, need to change.

INTRODUCTION

Preanaesthetic or preoperative fasting is a universally practised in elective cases to reduce the risk of pulmonary aspiration of gastric content posed by the combination of regurgitation and loss of protective airway reflexes by anaesthetic agents.The ultimate aim of surgery and anesthesia is to ensure patients' safety, minimal morbidity, complications and early post operative recovery.Anesthetic agents or sedation leads to loss of the gag, cough and swallow reflexes which are the protective airway reflexes. Aspiration of as little as even 30–40 mL of aspirate can be a significant cause of suffering and death during an operation and hence fasting is advocated to reduce the volume of stomach contents as much as possible.The practice to keep patient nil per oral is hence practiced universally.[1] Also,in order to further minimize the risk of aspiration, various drugs like antacids, prokinetics, etc are given to the patients on night of and morning of surgery. . Gastric aspiration resulting in pneumonia was first described by Dr Mendelson and the complication is known by his name as Mendelson's Syndrome. Long fasting hours eqivalent to minimum 8-9 hours is usually practised.[2] However sometimes they are prolonged to even 12-14 hours due to delay in surgical list. Other than full stomach, other factors that contribute to risk of aspiration are pregnant females and obese patients.Prolonged fasting may be an unpleasant experience causing distress, fatigue, irritability and medical complications, such as dehydration, biochemical imbalance and hypoglycemia, especially in pediatric age group where it poses as a big challenge, as it also adds to the anxiety of the already distressed parents. Also, Small children have a higher metabolic rate and reduced glycogen stores compared with adults. In 1974, Thomas found a 28% incidence of hypoglycaemia in toddlers that were starving for at least 6 h, as opposed to those who had a milk drink 4 h before surgery.[3] Furthermore, ketoacidosis is observed in children less than 36 months due to prolonged fasting.[4] Studies in the literature have shown that reduced pre-operative fasting intervals are safe for the patient, whilst also improving patient hydration and comfort.Also, in a large retrospective analysis it is proven that unrestricted clear oral fluids right up to transfer to the theatre could significantly reduce the incidence of postoperative nausea and vomiting without an increased risk in the adverse outcomes. Majority of children are starved for much longer than they need to is the main reason why we need to consider for changing the guidelines according to the timings of the cases.[4] Several studies have reported many children fasting for up to 12 or 15 h in spite of the implementation of the 6-4-2 guidelines.Resulting into side-effects, such as hypoglycaemia, metabolic acidosis, dehydration, cardiovascular instability, discomfort, hunger, thirst, and grumpiness, especially in toddlers and infants.This again adds to unpleasant experience of both pediatric patients and their parents which is in contradiction to the sole aim of surgery and anesthesia to give a better experience and outcome to the patients.

AIMS

To assess the dehydration status of a paeditraic patient based on clinical dehydration scale.

OBJECTIVES

1) To asses the complaints of paient suggesting dehydration on well designed proforma.
2) To asses amount of dehydartion according to dryness of mucous membranes by using finger print impression

MATERIALS AND METHOD

The observational, double blinded study was carried out randomly (WIN PEPI randomisation) on 100 heamodynamically stable paediatric patients (confidence interval at 95% and power of study at 80%, using software WIN-PEPI , total sample size required for study stood at 94 but for sake of convinience 100 was considered) belonging to ASA (American Society of Anaesthesiologists) grade I and II, aged between 0 to 14 years, including either gender, and meeting all inclusion exclusion criteria scheduled for elective surgeries. The pre anaesthetic details and pre operative complaints pertaining to dehydration and recording of thumb impression on filter paper was recorded in a well designed proforma after attaining consent from parents of patients. The statistical analysis was done by using parametric test and final interpretation by using 'Z' test (standard normal variant) with 95 % significance. Quantitative data was analyzed by student's' test and Qualitative analysis by Chi square test.

Inclusion Criteria

1. ASA grade I or II fit patients.
2. Ages between 0-14 years of either gender.
3. Patients posted for surgeries and hence already on NBM orders.
4. Hemodynamically stable patients with all routine investigations within normal limits without any other co-morbidities.

Exclusion Criteria

1. Patients with ASA physical status III or more.

2. Patients in shock, ICU patients, pre intubated patients.
4. Patients with drug allergies
5. Patient refusal.

Material Required

1. Standard anaesthesia machine (Boyle's apparatus).
2. Monitoring equipment like pulse oximeter, ECG monitor, non-invasive blood pressure (NIBP) apparatus.
3. Intravenous cannula 20G.
4. Intravenous fluids-Crystalloids & Colloids.
5. Disposable syringes, disposable sterile gloves, sterile dry hand towel, sterile gown and dressing.
6. Drugs and equipment necessary for resuscitation. (Ephedrine and Phenylephrine)

PROCEDURE:

Preoperative evaluation including general and systemic examination and laboratory investigations was conducted and data was entered. Patients were kept nil by mouth from midnight prior to surgery.

Time at which the patient was wheeled into operation theater, the hydration status, duration of preoperative fasting was calculated was recorded, analysed and compared with literature. The patient were assessed for nausea and vomiting based on active vomiting . The toungue was assessed to find the degree of hydration based on finger print impression over filter paper. The mother of the patients were asked to roll their index finger over the tongue of the patient which was further pressed over a filter paper. Scoring was done as follows:

5- almost full finger impression
3- half finger impression.
1- No finger impression

OBSERVATIONS AND RESULTS

One hundred children were included in the study who underwent elective surgery in our hospital during the study period. Sixty (60%) were males and forty (40%) were females. The age and gender distribution are shown in Table 1.

Table 1: Age and gender distribution of children

Age	Males	Females
≤1 year	20 (33.3%)	13 (32.5%)
1 to 5 years	16 (26.7%)	14 (35%)
5 to 10 years	10 (16.7%)	6 (15%)
10-15 years	14 (23.3%)	7 (17.5%)
Total	60 (100%)	40 (100%)

The preoperative fasting time for food [solids and milk (breast and non-human)] ranged between 4 h and 16 h (mean ± SD was 11.25 ± 3.5 h). The preoperative time without water ranged between 2 h and 16 h (mean ± SD was 9.25 ± 4.25 h). None of the patients were on intravenous fluids. Percentage of children without food and water for various time intervals are shown in Figures 1 and 2.

Table 2: Preoperative time without food [solids and milk (breast and non-human)]

Hours of fasting	Frequency
4 to 6 hours	12
6 to 8 hours	6
8 to 12 hours	38
>12 hours	44
Total	100

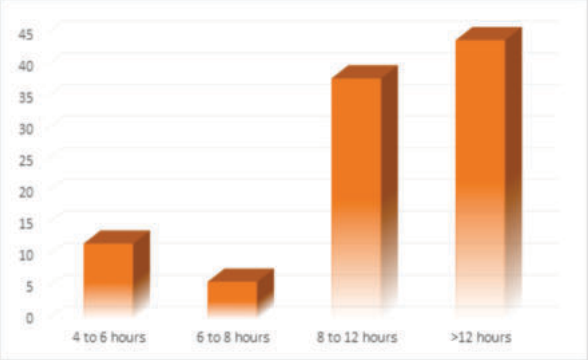

Figure 1: Bar graph showing Preoperative time without food [solids and milk (breast and non-human)]

Since all the cases were elective; they had undergone pre-anesthetic assessment. The instructions given by anesthesiologists were to keep the patients fasting for six hours. It was never mentioned that fluids could be administered orally up to two hours before surgery. Majority of the patients were asked to fast from midnight regardless of the time of going to the operation theatre by ward nurses. Change in scheduled list of surgery was also an important cause.

All cases waited for their turn in the pre-operative rooms of the operation theatre. The patients whose surgery was cancelled were allowed to drink fluid before leaving the theatre and returning to their respective wards. They also were examined for their hydration status. Forty patients (40%) showed clinical evidence of dehydration in the form of dry tongue. The finger impression on the paper was taken for all cases and the data is shown in Table 3.

Table 3: Finger impression

Finger Impression	Frequency
Almost full	23
Near Half	37
Hardly any	40
Total	100

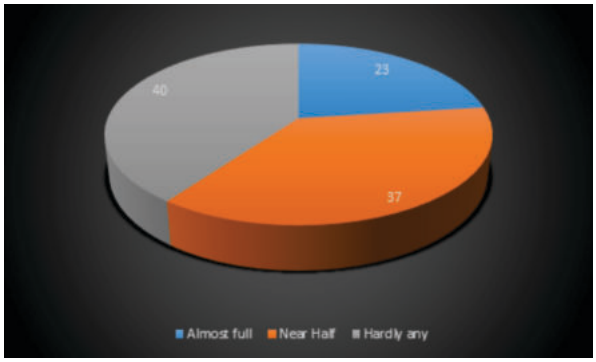

Figure 2: Pie chart showing finger impression frequency

DISCUSSION

Children, like adults, are often advised to have nothing to eat or drink from the midnight before surgery. Prolonged fasting causes thirst, hunger, anxiety and drowsiness.[5] The results of this study revealed that the importance of pre-operative fasting adherence to guidelines in improving unnecessarily prolonged fasting practices and patients' comfort in the perioperative periods. This was the first survey carried out to assess the preoperative fasting hours in children in our hospitals. This study showed that the majority of participants who were underwent elective surgery (88%) had prolonged NPO instructions, whether they are scheduled for an early or late procedure. There is a scarce study on preoperative fasting policy.

Our study is similar with the study done at a major teaching hospital in Gondar University majority of patients fasted from both fluid (95 %) and solid food (92 %) longer fasting hours than the recommended by the international fasting guidelines.[6]

This study also comparable with study done in Japan majority of the patients (90%) fasted from fluid longer than the recommended preoperative fasting hours of the guidelines.[3] Of the study patients, 12% had fasted for clear liquids with following protocol (2hrs). A similar study was done in Pakistan only 2.9% children had fasted for clear liquids according to the recommended fasting time (2 hours).[7] The difference of the study might be due to relatively small samples.

A meta-analysis of 25 trials found that children who were denied oral fluids for more than 6 h preoperatively did not benefit in terms of intraoperative gastric volume and pH as compared with children who were permitted unlimited fluids up to 2 h preoperatively.[8] ASA, ESA, APAGBI and RCN have formulated liberal guidelines for preoperative fasting in children (2-4-6 rule).[9-12]

The study showed that children who experience excessive fasting times resulting in a lot amount of pre-operative discomfort. The majority of children fasted as instructed were severely hungry, thirsty, anxiety, and drowsiness due to that the times of fasting are still too

long.[13] Even though, there may be different reasons behind for extended fasting, including children being fed earlier in the evening and sleeping for longer on the night before.[14] A study was done by Endale G.(2014) showed that 49 % of patients had experienced slight to severe thirst due to prolonged fasting from fluid.[10] This implies that children in waiting of the procedure faced unnecessary stressful and metabolic discomfort. But, several meta-analyses of trials showed that children who were preoperatively fasted more than 6 h from oral fluids did not benefit intraoperative gastric volume and pH as compared with who were allowed unlimited liquids up to 2 hours before surgery.[15]

This study showed that the mean fasting time to liquids and solids were very higher than ASA recommended. NPO hours for clear liquids were 9.25±4.25 (Ranges 2-16 hours), the mean hours for breast milk and solid foods 11.25±3.5 (Ranges 4-16 hours). A study published by Aguilar-Nascimento et al. showed also supported our findings that the median fasting for 13 h (6- 21h) in a group that used the traditional recommendations.[10] Another audit study also found a similar evidence that the conventional preoperative fasting hours were prolonged more than 50% of the patients fasted twice longer than the guidelines.[6] Another study indicated that the mean fasting time for clear liquids is 7.65 times and for solids 2.5 times longer than the preoperative fasting times recommended by ASA.[12] A study was done by Arun B. on preoperative fasting hours for solids and milk (breast and nonhuman) was between 4 h and 18.75 h (11.25 ± 3.5 h) and clear liquid (water) ranged between 2 h and 18.75 h (9.25 ± 4.25 h).[17]

CONCLUSION

The fasting times for pediatric patients in our study were typically far longer than current guidelines. Sequence of patients schedule and common instructions of NBM from midnight for all patients were probably the causes of unnecessary prolonged fasting experiences in children.

RECOMMENDATION: The guidelines of NPO after midnight are still practiced, despite the overwhelming evidence of safety and benefits in reducing preoperative fasting time for children.The need for adjustment of fasting time according to the scheduled operation list and to that sequence is the most important consideration.. This helps us to adjust fasting times according to position on the operating list. Alongwith the consideration of their turn on the scheduled OT list , the cancellation of case should also be considered to determine from when to keep the patients NBM. A further study including other tertiary care hopsitals all over is also needed to determine this further.

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