

Correlation Between Duration of Preoperative Fasting and Emergence Delirium in Pediatric Patients Undergoing Ophthalmic Examination Under Anesthesia as Day Care Procedure: A Prospective Observational Study

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BACKGROUND

- An examination under anesthesia (EUA) is required for a thorough examination of the eye in children.
- Common indications for EUA include:
 - Intra ocular pressure measurement in congenital glaucoma
 - Congenital cataract
 - Examination and Ultrasound in retinoblastoma
 - Suture removal
 - Therapeutic procedures such as laser treatment.
- Standard preoperative fasting guidelines for elective procedures requiring general anesthesia and sedation have been laid down by American Society of Anesthesiologist.
- Busy set up, delays in the operating list frequent .
- Young children do not tolerate fasting as they have a higher glucose requirement.
- Children often become hypoglycemic by the time of induction of anesthesia.
- Prolonged hypoglycemia makes both the child and mother apprehensive.
- Anxiety leads to crying and irritability in the preoperative period.
- Impact in the post-operative outcome in the form of emergence delirium.

AIM

- To observe if there is any correlation between the duration of preoperative fasting and emergence delirium in children undergoing ophthalmic examination under anesthesia

Material & methods

- Institute ethics committee, Informed parental consent

INCLUSION -

- Children 2-6 years of age with ASA physical status I or II scheduled for EUA were included in this observational study.

EXCLUSION-

- Children of ASA physical status III or IV
- Children with developmental delays, or any neurological or cardiac diseases
- Parental refusal
- Children undergoing any ophthalmic procedure requiring surgical incision Or laser treatment have been excluded from this study.

- No patient received oral premedication and parents accompanying the patient were asked the time of last per oral intake, duration of fasting and type of food taken last.
- Parents allowed to accompany their children from the pre-operative area to the OR
- Induction with 8% sevoflurane in 50% nitrous oxide and oxygen
- After achieving an adequate depth anesthesia with an end tidal anesthetic concentration equivalent of 1.8- 2.0 times of minimum alveolar concentration, an intravenous cannula was secured and fasting blood sugar (FBS) was measured using a glucometer.
- An appropriate sized classic LMA was inserted and fixed for maintenance of airway.
- GA was maintained on spontaneous respiration maintaining an adequate depth and minute ventilation.
- I V fluid was calculated as per the duration of fasting period and using Holliday and Segar formula and the fluid deficit was replaced.
- After the completion of EUA, sevoflurane was stopped and 100% oxygen was administered at a flow of 5 l.min⁻¹.
- LMA was removed at MAC ≤ 0.3 and patients were shifted to the post anesthesia care unit (PACU) for monitoring vitals and observation of emergence delirium (ED).
- ED was assessed by an independent trained anesthesiologist in the PACU who is blinded to the duration of fasting and FBS using the Pediatric Anesthesia Emergence Delirium scale (PAED) >10 points during each 5 min interval till 30 minutes from the time of awakening.
- Patients who were asleep before these intervals were given a zero score.
- Adverse effects, time to spontaneous eye opening and time to discharge from PACU were noted.
- Patients were discharged when calm and with a modified Aldrete score > 9.
- IV fentanyl 0.5 mcg.kg⁻¹ was administered as rescue medication and was repeated after 10 min if the agitation did not subside.

RESULTS

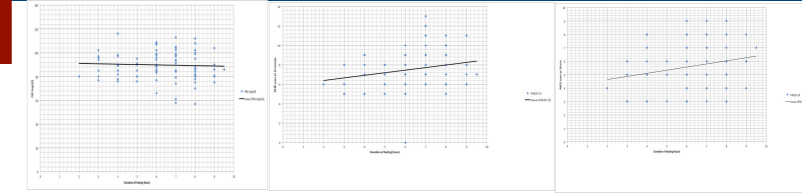
- Only one child had a blood glucose <60 mg/dl.
- The lowest recorded blood glucose was 57mg/ dl. Mean (SD) duration of fasting to clear liquid was 6.3 (1.7) hrs.
- Twenty four children (24%) had atleast one recorded PAED score >10 at any time point in the postoperative period.
- As LMA was removed by the guidance of depth of anesthesia, all the children were sedated at 5 minutes following LMA removal; consequently PAED score at 5 minutes were zero all patients.

Table 1: Demographic & baseline characteristics of the patients (n=100)
 Data expressed as mean (SD) or proportions as applicable

PARAMETERS	VALUE
Age (years)	3.9(1.7)
Sex (Male/ female)	56/44
Body weight (kg)	13.1(3.2)
Duration of fasting for liquids (hours)	6.3(1.7)
Baseline fasting blood glucose (mg/dl)	89.7(11.7)
Duration of procedure (minutes)	11.9(2.6)

Table 2: Correlation between fasting blood glucose & duration of fasting with PAED score at different time point

	PAED10	PAED15	PAED20	PAED25	PAED30
FBS	r ² =-0.05 p=0.61	r ² =-0.16 p=0.12	r ² =-0.13 p=0.19	r ² =-0.03 p=0.81	r ² =-0.02 p=0.87
Duration of fasting	r ² =-0.01 p=0.89	r ² =0.24 p=0.02	r ² =0.23 p=0.02	r ² =0.02 p=0.88	r ² =0.01 p=0.93



No correlation has been found between duration of fasting and blood glucose level (r²= -0.05, p=0.65, Pearson's correlation, figure 2)

PAED score at 15 minutes & 20 minutes are significantly correlated with duration of fasting (r²=0.24, p=0.02, Pearson's correlation, figure 3 and r²=0.23, p=0.02, Pearson's correlation, figure 4 respectively.

DISCUSSION

- Significant correlation between duration of fasting to clear liquid and postoperative emergence score at 15 minutes and 20 minutes after surgery.
- No correlation has been found between fasting blood glucose and ED
- Longer preoperative fasting in children will cause a higher preoperative anxiety, thirst and hunger; all of these can contribute to postoperative agitation.
- 24% incidence of postoperative ED considering a cut off value of PAED score >10, which is similar to the incidence reported by Sethi S.
- Decrease in PAED score over time at PACU..

LIMITATION AND CONCLUSION

- Preoperative anxiety was not assessed
- Liquid drinks of different energy content

Preoperative fasting duration may be a risk factor for postoperative emergence agitation in children undergoing ophthalmic examination under general anesthesia.

REFERENCES

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