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THE EFFECT OF PREOPERATIVE APPLE JUICE ON THE PREVALENCE OF HYPOGLYCAEMIA IN PAEDIATRIC PATIENTS

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, in partial fulfillment of the requirements for the degree

of

Master of Medicine in Anaesthesia

Johannesburg, 2012

DECLARATION

I, Clover-Ann Patricia Lee, declare that this research report is my own work. It is being submitted for the Degree of Master of Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Signature

Signed at: University of the Witwatersrand, Johannesburg

On this date: 08.05.2012

PRESENTATIONS ARISING FROM THIS PROJECT

Poster Presentations:

"Clear apple juice on the morning of surgery reduces the prevalence of hypoglycaemia in children" presented at:

1. Paediatric Anesthesia Congress of South Africa, Johannesburg, November 2010
2. Society of Pediatric Anesthesia Annual Meeting, San Diego, USA, March 2011.

ABSTRACT

Background: Children have historically been fasted for prolonged periods preoperatively to reduce the volume and acidity of their gastric contents and thus the risk of regurgitation and pulmonary aspiration. Evidence shows that this risk is not increased by following the current recommended fasting guidelines, and that prolonged fasting may be detrimental to children, who may present with hunger, thirst, depleted intravascular volume, metabolic acidosis and hypoglycaemia.

A recent study at Charlotte Maxeke Johannesburg Academic Hospital showed a 18.5% prevalence of biochemical hypoglycaemia, defined as a blood glucose concentration of less than 3.5 mmol/l, in children from one to five years of age presenting for elective surgery.

Aims: The aims of this study were to document the prevalence of biochemical hypoglycaemia in children from the ages of one to five years who were given apple juice to drink at least two hours preoperatively, and to compare these results to a historical control group.

Methods: A prospective, contextual comparative study design was used. Approval was obtained from the University of the Witwatersrand's Human Ethics Committee and other relevant authorities.

The groups were matched for age and weight. Consent was obtained from the guardians of all children who met the inclusion criteria before being enrolled in the study.

A standard 200 ml carton of commercially available apple juice was offered to each participant. The volume and time of the juice consumed was documented, along with relevant demographic data. Inhalational induction of anaesthesia

proceeded a minimum of two hours later, and a venous glucose concentration was measured.

Results: The prevalence of biochemical hypoglycaemia was statistically significantly reduced in the intervention group ($p = 0.0163$), eliminating the effect of prolonged preoperative fasting.

Conclusion: The consumption of clear apple juice on the morning of surgery is a safe, inexpensive, effective way to reduce the prevalence of hypoglycaemia in children presenting for elective surgery.

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