Gastric residual volumes in critically ill paediatric patients: A comparison of Feeding Regimens of Patients.


Presenter: Abeiku Yankson
Outline

• Introduction
• Methodology
• Results
• Clinical implications
• Recommendations
Definitions

• Delayed Gastric Emptying was defined by this study as Gastric Residual Volume (GRV) $>5\text{ml/kg}$.
• High GRV = 4th hourly GRV $>12\text{ml/kg}$ or 200mls max.

Assumptions

1. ↑Absorption of feed = ↓GRV.
2. No reliable assessment tool.
3. GRV is not constant; difficult to determine acceptable volume.
1. Hypothesis

$H_0$: There is a 50% probability that GRV of one feeding regimen is higher than the other at any point in time.

Related studies

No significant difference in mean GRV of Adult neuro-surgical patients. (Kocan & Hickisch, 1986).
Introduction

Three (3) studies done on VLBW infants.

• Two (2) showed no significant differences in GRV of VLBW infants (n=52, n=82) (Toce & Homan, 1987; Silvestre et al., 1996).

• Lower GRV in intermittently fed participants (n=171). using 3rd hourly GRV ≤ 2ml/kg. (Schanler et al., 1999).
Purpose of study

• To find out which feeding regimen led to decreased or increased delayed Gastric emptying in paediatric critically ill patients.
Ethical considerations

• Approved by University and Hospital Ethics Committee.

• Informed consent signed by parents of each participant.
Methodology

• Study Design: Randomised Controlled trial
• Sampling Tool: Convenient sampling technique
• Continuous group: 22 (m=12, f=10)
• Intermittent group: 23 (m=15, f=8)
• Total Sample size: 45 participants
• Setting: Tertiary Intensive care Unit
Methodology

• Inclusion criteria
  All Infants admitted to PICU within a 9 month period.

• Exclusion criteria
  ✓ Diarrhoea;
  ✓ Anticipated transfer <72hrs;
  ✓ Vomiting.
Methodology

Exclusion criteria cont.

- Children on specified feeding regimen.

The study duration: 72 hours.

SAS and SPSS were used for analysis.
Feeding Protocol

- All participants fed via polyvinyl gastric tube.
- Continuous group = 24 hours continuous feed by Feeding pump.
- Intermittent group = 2hourly feeding via syringe using gravity method (over 20-30mins).
Feeding Protocol Cont.

- GRV was measured 4hourly using a 30ml or 50 syringe.

- All GRV ≤ 5ml/kg were given back to participants.
Statistical Analysis

- Wicoxon’s two sample and Fishner’s exact tests were used for Continuous and Categorical variables respectively.
- Statistical significance = P value < 0.05.
- Data analysed with SAS and SPSS.
Results

• There was no difference between the two groups in terms of the following;

  * Gender
  * Weight
  * Volume of feed
  * Primary diagnosis

NB. None of the above characteristics had P value < 0.05.
Results

• Theoretical basis for GRV of < 5ml/kg or 150ml (Taylor & Baker, 1999) was confirmed. Approx. 95% of all participants recorded GRV ≤ 5ml/kg.

• No significant difference in median GRV/Kg values between treatment group over the period of study. (continuous group medians were on average 1.04 higher).

• Both groups recorded the same number of participants for fourth hourly GRV≥5ml/kg.
Nursing Implications

• Acceptable GRV after 4 hours of feeding should not exceed 5ml/kg irrespective of the age, gender, weight, medication, condition, volume of feed and state of health.

• GRV of 150mls for critically ill paediatric patients is an alert sign.

• There is no significant difference in 4th hourly GRV between Paediatric Intensive Care patients fed continuously and those fed intermittently.
The results of this study suggest that the incidence of delayed gastric emptying as defined as 4th hourly GRV > 5ml/kg is similar for both continuously and intermittently fed Paediatric Intensive Care patients.
Recommendations

• Elevate the head of the bed to 30 degrees or greater for at least 1 hour after an intermittent feeding.
• Keep it elevated at all times for continuous feedings.
• Assess residual volume every 4 to 6 hours for continuous feedings and just before each intermittent feeding (Pollen, 2004: 18).
New studies: NG feeding VS PP feeding

- Systematic review and meta-analysis of published RCT comparing the effectiveness of nasogastric feeding against postpyloris (nasoduodenal & nasojejunal) feeding.
- 1496 critically ill surgical patients.
- Results: ↓ GRV, ↓ risk of aspiration pneumonia and ↑ caloric intake (Sajid et al., 2014).