Research Explained

Feeding Variation Among Infants in Acute Care Cardiology Units

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About this Study

Why is this study important?
Infants born with heart disease often have difficulty eating and gaining weight. The challenges can be caused by heart disease itself or by the surgeries and other treatments these children receive. It is important to give children with heart disease good nutrition because it can improve their health and the outcomes of future surgeries. Children's hospitals that perform surgery have special feeding plans that help babies with heart disease including using different feeding tubes or types of milk and formula. The problem is that there is no agreement on which feeding plan is the best for these children. This study was performed to evaluate the different ways that hospitals approach feeding infants during a hospital stay and when they are discharged home.

How was this study performed?
The researchers used the Pediatric Acute Care Cardiology Collaborative (PAC^3) database to study over 15,400 hospital discharges from 24 centers between February 2019 and October 2021. The focus was on the human milk or formula provided and how the infants were fed when they left the hospital. The researchers had two questions.

1. What types of human milk or different formulas did children receive when they left the hospital?
2. Did the children eat by mouth or use a special feeding tube?
    a. If the children used a tube for feeding how were the feeds given (a slow continuous feeding or feeding only at mealtimes)?

The researchers described the findings and used graphs called funnel plots that show the differences between each hospital compared to the average for the whole group.

What are the results of the research?
The researchers identified that there is a lot of variation in the specialized feeding plans for children with heart disease. They reported the average for the entire group, but more importantly, they looked at differences between the averages for each hospital.

<u>Type of Nutrition at Discharge:</u>
- Standard Formula: The average for all hospitals was 54% with individual hospitals ranging from 41% to 83% of infants being discharged on standard formula.
- Human Milk: The average for all hospitals was 41% with individual hospitals ranging from 21% to 61% of infants being discharged on human milk.

- Elemental formula (a formula easier to digest): The average for all hospitals was 21% with individual hospitals ranging from 3% to 40% of infants being discharged on elemental formula.

Feeding Method:

- Feeding by Mouth: The average for all hospitals was 48% with individual hospitals ranging from 35% to 78% of infants being discharged feeding by mouth.
- Feeding through a nasogastric (NG) tube (a tube that goes from the nose to the stomach): The average for all hospitals was 36% with individual hospitals ranging from 7% to 55% of infants being discharged with nasogastric tube feeds.
- Feeding through a gastrostomy (G-) tube (a tube that goes directly into the stomach through the skin): The average for all hospitals was 13% with individual hospitals ranging from 4% to 32%.
    - For children receiving tube feeding at discharge, most (91%) had the tubes enter their stomach, and fewer (9%) had the tubes go past their stomach into their intestines (called a gastrojejunostomy, or GJ, tube).
    - For children receiving tube feeding at discharge 63% had continuous feeds and 29% had feeds broken up during the day (bolus). Some children (8%) had a combination of both.

The researchers also evaluated different patient characteristics that might impact the feeding methods. They found that premature infants, those with genetic syndromes, and those with single ventricle heart disease were more likely to need a feeding tube at discharge.

What are the limitations of this study?

While there is a lot of variation in how different hospitals use the different feeding tools to help infants with heart disease, this study does not make recommendations regarding which methods are best. This study was based on feeding in the hospital only and many of the important data points to understand the best methods to feed children happen outside of the hospital.

What is the impact of this study?

This study highlights the need for hospitals to collaborate to find the best feeding plans for different patients. The researchers recommended that teams come together to study how these feeding methods impact the life of children after they go home. Hospitals should not use this paper to recommend a specific feeding plan, but should recognize that patients with prematurity, genetic syndromes, and single ventricle heard disease may require more support.