



National Pediatric Cardiology
Quality Improvement Collaborative

Research Explained

Cardiovascular intensive care unit variables inform need for feeding tube utilization in infants with hypoplastic left heart syndrome

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ABOUT THIS STUDY

The goal of this study is to develop a scoring tool to help identify which babies with HLHS will need a feeding tube to increase nutrition and support growth.

Why is this study important?

- Hypoplastic Left Heart Syndrome (HLHS) babies unfortunately can have a lot of complications including poor feeding and delayed growth.
- Previous studies on HLHS babies have shown poor weight gain is associated with longer hospital stays, more infection risk, more issues after surgery, and problems with development.
- Because of their heart condition, HLHS babies can have more work of breathing and higher respiratory rates, causing them to burn calories faster than babies without heart disease. This makes their calorie needs higher, and is why nutrition is so important.
- HLHS babies can also have feeding struggles because of not wanting to have things in their mouth (oral aversion). This is because these babies have often had a breathing tube in, needed to be on medicines that can make them sleepy, and can have an abnormal motion of the vocal cords.
- These problems can make a feeding tube necessary.
- Feeding tube utilization (FTU) – the use of a feeding tube either through the nose or directly into the stomach - varies between different hospitals, with studies showing rates of FTU all the way from 15 to 60%.

How was this study performed?

- This study was done at Boston Children's Hospital over a 10-year period for babies with HLHS who underwent stage 1 palliation – the first of the three stages of surgery for HLHS.
- The babies in the study were divided into two groups: 1. feeding tube and 2. feeding by mouth.

What were the results of the study?

- 180 babies were studied.
- The babies were mostly male (68.3%) and white (63.3%).
- Most of the babies has a Sano as the type of shunt with their stage 1 palliation (85.6%).
- 36.7% (66 babies) went home with a feeding tube and 63.3% (114 babies) went home feeding by mouth.
- The babies were then compared based on different factors (race, sex, weight, gestational age, fetal intervention, length of stay in the intensive care unit and several others) to see which ones might predict whether a baby ended up with a feeding tube or not.
- Based on which of these factors seemed to be able to predict the need for a feeding tube, a score was developed called HV2.
- The HV2 score included the 3 factors that seemed to mean the most when predicting needing a feeding tube – results of head imaging, number of days on a breathing machine, and abnormal vocal cord motion (vocal cord dysfunction). Total scores ranged from 0-20.
 - Head imaging:
 - Abnormal = 7, Normal = 3, None available = 0
 - Days of ventilation
 - ≥ 14 days = 7, 9 – 13 days = 4, < 9 days = 0
 - Vocal cord dysfunction
 - Present = 6, Absent = 0
- A score of 12 was the threshold for a “high risk patient” – one that was more likely to need a feeding tube.

What were the limitations of the study?

- Babies were not included if they had known stomach/intestine issues such as duodenal atresia, died before discharge, or had surgical repair late - after 14 days of age.
- This study looked back at babies from the past (this is called a retrospective study), limiting some of the data that could be collected.

- This study only looked at babies at one hospital (single center), so the results might not apply to all centers where feeding problems are not treated the same way.

What it all means

- It is possible to identify babies with HLHS who are more likely to need a feeding tube using the HV2 scoring tool which included 3 clinical factors: head imaging results, number of days on a breathing machine, and abnormal vocal cord motion.
- It should always be kept in mind that every baby is different so any risk factor /predictor and even the HV2 score cannot always predict that a feeding tube will be needed.
- Other research has shown that placing a feeding tube earlier can reduce the amount of time in the hospital, which is a good thing.
- Using the HV2 scoring tool in newborns with HLHS could help make the decision about a feeding tube sooner, improving their overall health, including less time in the hospital and better growth.