

Feeding Interventions for Infants with Vocal Fold Immobility Following Cardiac Surgery



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BACKGROUND

- Postoperative injuries to the recurrent laryngeal nerve are common after infant cardiac surgery, and result in vocal cord dysfunction.⁵
- Infants with vocal cord impairments are at higher risk for dysphagia and aspiration.⁶
- Studies evaluating management for vocal cord impairments in infants to date are lacking.⁷
- Therefore, the author conducted a retrospective chart review study, with the goal of examining efficacy of typical interventions used to minimize aspiration in infants with postoperative vocal cord dysfunction.

POPULATION & SETTING

- Conducted at a single tertiary pediatric hospital.
- Inclusion criteria included:
 - Infants <1 year old
 - Underwent cardiac surgery on or around the aortic arch
 - Diagnosed with unilateral vocal fold paresis by otolaryngologist
 - Received a postoperative videofluoroscopic swallow study (VFSS) from January 2017 to June 2022
- Exclusion criteria included:
 - Infants with known preoperative swallowing dysfunction were excluded

PICO QUESTION

- In infants with post-operative vocal fold immobility following cardiac surgery, is the use of thickened liquids or the changing of nipple flow rates more effective for decreasing aspiration during a VFSS?

SIGNIFICANCE

- Feeding is a meaningful occupation and primary ADL for infants.¹
- Aspiration, if gone undetected, can result in pneumonia, dehydration, malnutrition and/or poor developmental outcomes.⁴
- Skilled OT practitioners play a key role in the evaluation of high-risk infants.²
- There is strong evidence to support that improving feeding outcomes:
 - Decreases length of hospitalization⁴
 - Improves health, developmental outcomes, and quality of life⁴
 - Decreases caregiver stress & increases bonding experiences⁵
- Findings from this project will provide evidence to support the appropriate use or avoidance of the studied interventions so, as to limit postoperative morbidity for infants with vocal fold dysfunction.

LITERATURE REVIEW

- Infants with surgical repairs on or around the aortic arch are at highest risk for postoperative vocal fold paresis with incidence ranging between 13% to 58%.^{3, 6}
- Positive correlation between vocal fold dysfunction and dysphagia with incidence ranging between 22% and 70%.^{3, 6}

- Diet modifications improve swallowing safety for individuals with dysphagia.⁸
- Thickening liquids and modifying nipple flow rate are the most common interventions used to support dysphagia in infants.⁸
- A family-centered care approach is best practice when treating hospitalized infants.⁵

METHODS

- Retrospective chart review study design was used.
- Guided by Compensatory and Neuroprotective/Developmental Care evidence-based conceptual frameworks.
- IRB was obtained from Stanford University.
- Participant demographics in Figures 1 and 2.

Figure 1. Participants by congenital cardiac anomaly

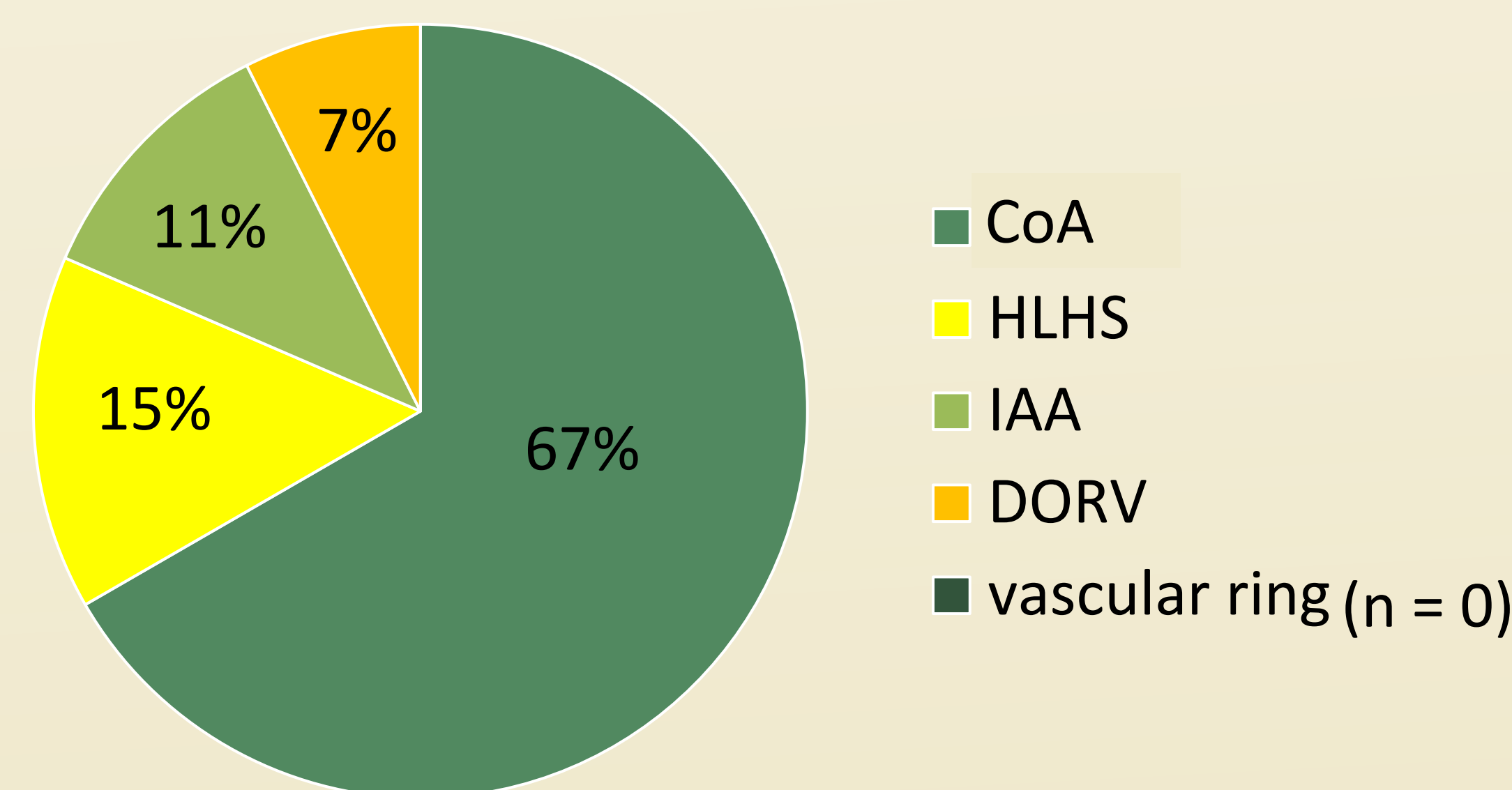
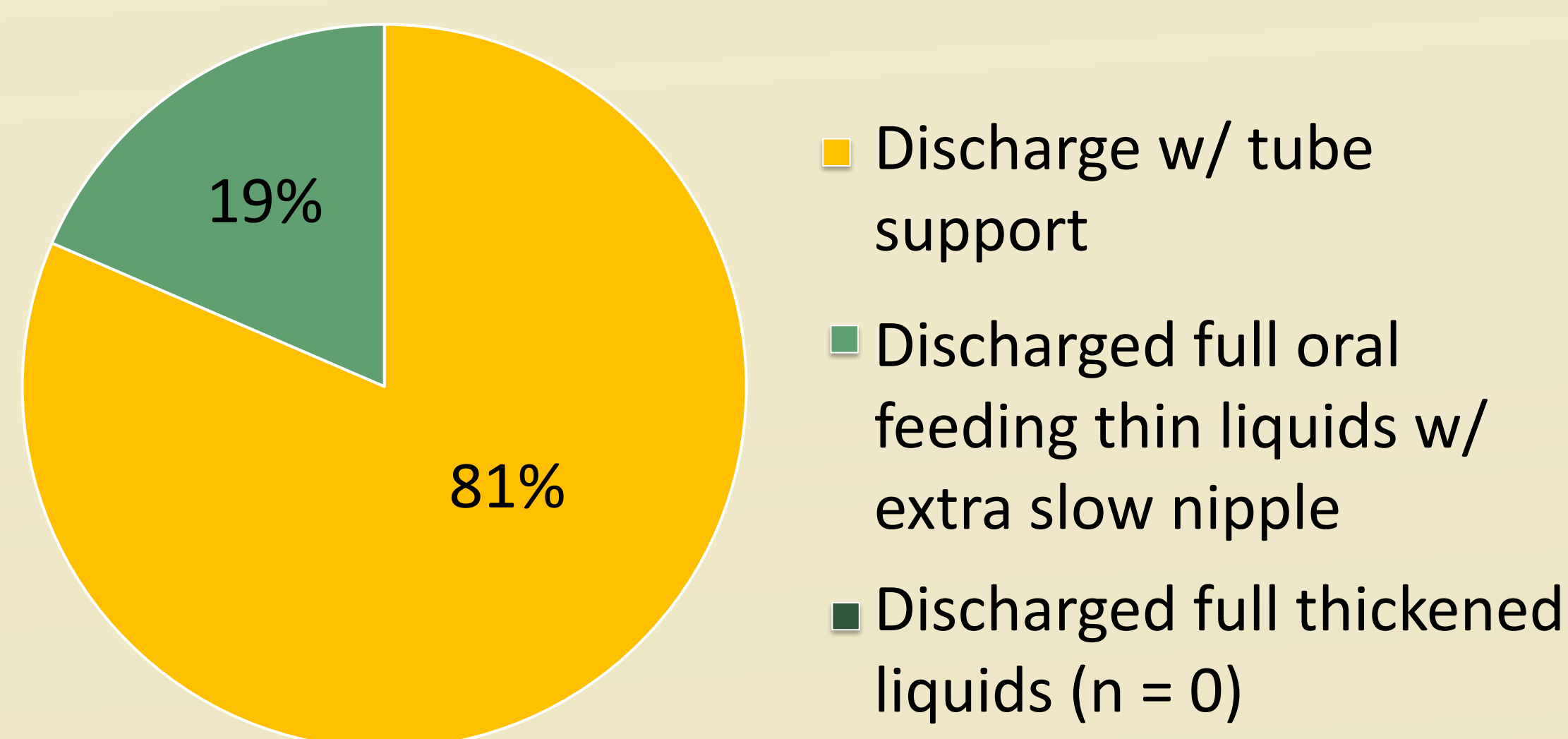


Figure 2. Feeding status at discharge

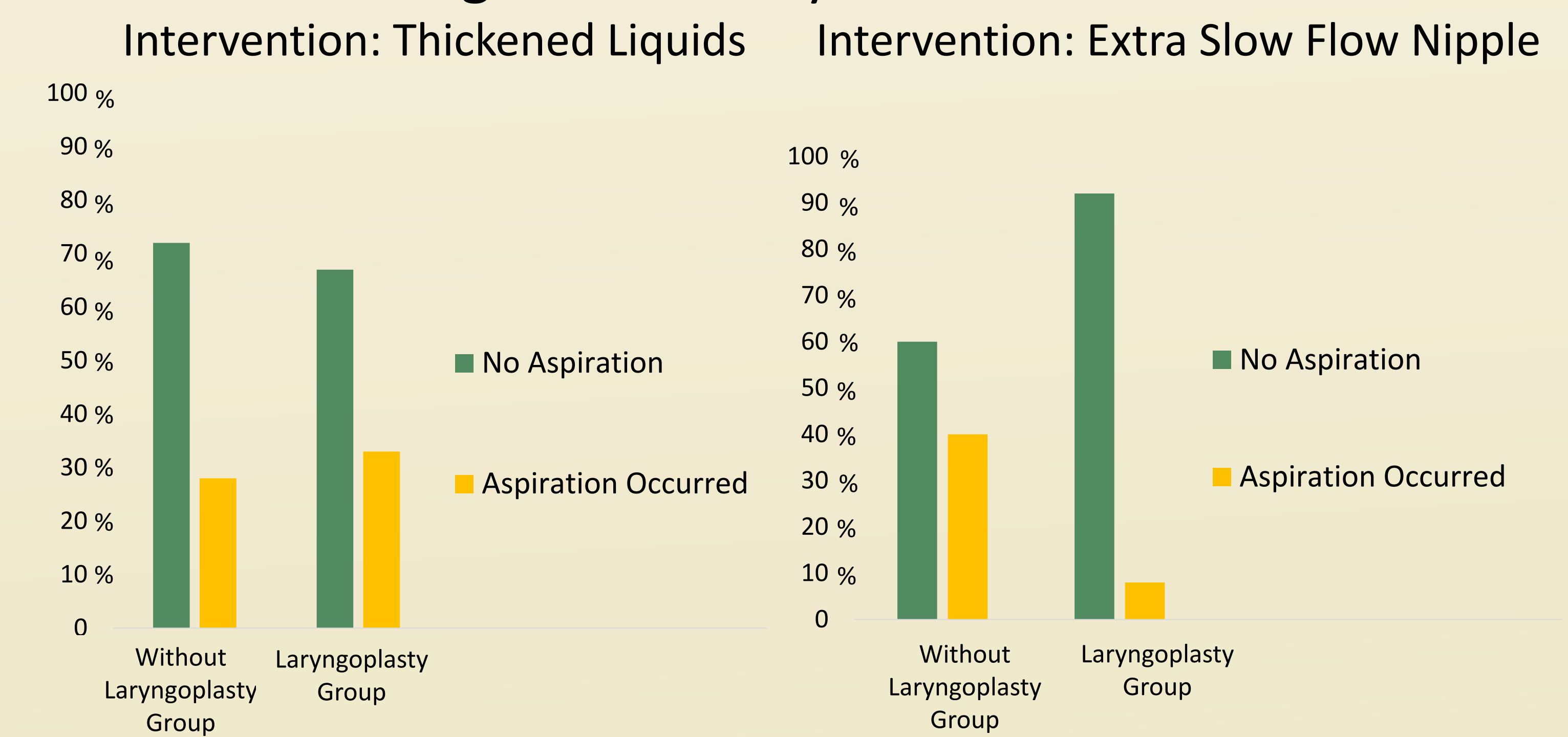


- Quantitative data were collected from participant's EMR using checklist of specific criteria extracted from VFSS reports including swallowing results and feeding intervention used;
- Given the potential impacts on swallow function following vocal fold augmentation, participants were divided into two groups:
 - 1) without laryngoplasty group
 - 2) laryngoplasty group
- Descriptive statistics were applied and data were analyzed comparing aspiration incidence

RESULTS

- 33 VFSS included for a total of 27 participants
- 14 male and 13 female infants were included
- Coarctation of aorta (CoA) was the most common cardiac anomaly (Fig. 1)
- Mean age of participants was 12 weeks old (SD = 14.4)
- The without laryngoplasty group aspirated more frequently than the laryngoplasty group (P = 0.01)
- When aspiration occurred, the majority of the time it was silent (≥75%)
- Thickened liquids improved incidence of aspiration greater than an extra slow flow nipple for the without laryngoplasty group (Fig. 3)
- An extra slow flow nipple improved incidence of aspiration greater than thickened liquids for the laryngoplasty group (Fig. 3)
- Majority of participants (81%) discharged to home with a feeding tube (Fig.2)

Figure 3. Efficacy of Interventions



SUMMARY

The small sample size is a limitation to this study. Infants with vocal fold immobility are high-risk for silent aspiration, and discharging home with feeding tube support is very common. OT practitioners should consider vocal cord augmentation as a factor when choosing between feeding interventions for infants with vocal fold paresis. Data from this small retrospective chart review study can be used to guide OT practitioners treating infants with vocal fold immobility, and may inform future research with larger sample sizes to evaluate the efficacy of feeding interventions for this population.

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