Feeding/Swallowing Impact Survey as a Predictor for Dysphagia in the Pediatric Population

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Abstract

Introduction:
- Instrumental swallowing assessments are the gold standard for diagnosis of pediatric dysphagia but are not without risks.
- We aimed to determine if the Feeding/ Swallowing Impact Survey (FS-IS) can be used as a screening tool to predict instrumental swallowing assessment outcomes.

Methods:
- Prospective cohort study conducted at a single institution.
- Caregivers of children undergoing initial VFSS were identified and administered FS-IS within three weeks prior to VFSS.
- Non-parametric Spearman correlation coefficients were used to compare the strength of association between the caregiver FS-IS, PAS, and FOIS scores, based on VFSS recommendations.
- Multivariable linear regression was performed to determine caregiver characteristics that may contribute to FS-IS scores.

Results:
- Of the 84 caregivers and children enrolled, 50 completed both the FS-IS and VFSS.
- No correlation was noted between overall FS-IS score and FOIS score, but a weak correlation was noted between the Worry Subscale and the FOIS (p=0.36).
- A weak correlation was noted between the PAS and effect on ADL's domain of the FSIS (p=0.03).

Conclusion:
- The FS-IS serves to assess the impact of the feeding and swallowing disorders, but may not be able to predict the likelihood of aspiration-penetration.
- Oral intake restrictions may be influenced by caregivers' degree of worrying.
- Penetration-Aspiration scale may only reveal certain elements of swallowing dysfunction. An improved tool for standardizing VFSS interpretation is needed.

Introduction

- 25-45% of pediatric population are affected by dysphagia.[1]
- Caregivers of children with dysphagia experience anxiety about not knowing how to feed their children, leaving their children with others, and uncertainty of duration of this problem.[2]
- Financial burden for families is high, as food modification and medical care make up large expenses.
- Video fluoroscopic swallowing study (VFSS) and Flexible Endoscopic Evaluation of Swallowing (FEES) are primary diagnostic tools, often paired with additional testings.[3]
- VFSS carries a radiation exposure risk, while FEES is associated with discomfort to the patient.
- **A screening tool may help cut down the costs and risks associated with instrumental testing.**

Methods and Materials

- Patients <18 years undergoing initial VFSS for diagnosis were identified in EMR.
- Parents were contacted by a study author for consent/verbal administration of Feeding/Swallowing Impact Survey (FS-IS).
- Following VFSS, penetration-aspiration scale (PAS) & Functional Oral Intake Scale (FOIS) scores were recorded.
- Non-parametric Spearman correlation coefficients were used for strength association between FS-IS and PAS/FOIS.
- Multivariable linear regression was used to determine other characteristics that may contribute to FS-IS scores.
- Cronbach alpha values were used to assess internal consistency of FS-IS questionnaire.

Table 1: Demographics and Feeding Tube, Feeding Status

Subject characteristic	n=50
Male sex, n (%)	36 (72)
Female sex, n (%)	14 (28)
Age Category	
0 - <1 Years, n (%)	20 (40)
1 - <3 Years, n (%)	18 (36)
≥3 Years, n (%)	12 (24)
Race	
White, n (%)	25 (50)
Black, n (%)	20 (40)
Multiracial, n (%)	5 (10)
Ethnicity	
Non Hispanic/Latino, n (%)	46 (92)
Hispanic/Latino, n (%)	4 (8)
Enteral Feeding Tube	
None	32 (64)
Nasogastric Tube	6 (12)
Gastrostomy Tube	11 (22)
Gastrostomy-Jejunostomy tube	1 (2)
Feeding Status	
Full PO	32 (64)
PO + Enteral Feeding	15 (30)
NPO	3 (6)

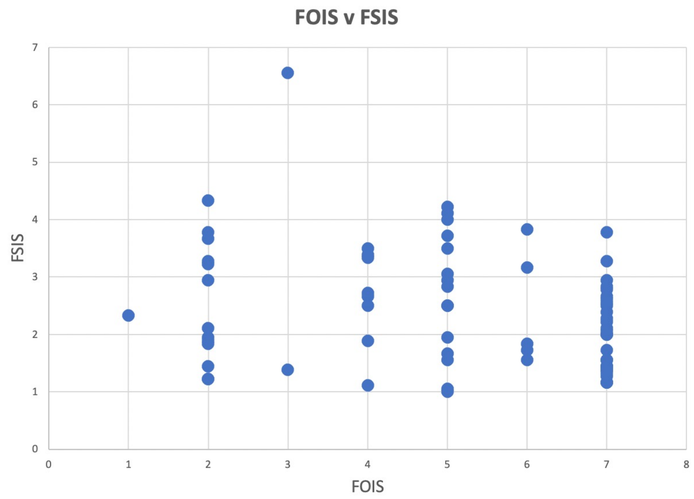
Table 2 Strength of association of PAS and each FS-IS domain by Spearman correlation coefficient. * = $p < 0.05$

		Category 1 (Effect on ADLs)	Category 2 (Effect on Worrying)	Category 3 (Effect on swallowing needs)
Thin Liquids (N=50)	PAS	0.30*	0.09	0.26
	Penetration, #	0.25	0.1	0.18
	Aspiration, #	0.13	0.05	0.13
Intermediate Liquids (N=28)	PAS	0.06	-0.1	0.12
	Penetration, #	-0.01	0.06	0.34
	Aspiration, #	0.15	-0.14	-0.07
Solids/Purees (N=36)	PAS	0.23	-0.15	0.11
	Penetration, #	0	0	0
	Aspiration, #	0.05	-0.09	0.08

Results

- 50/84 caregivers completed both FS-IS and VFSS.
- Only the penetration-aspiration scale for thin liquids and domain 1 (effect on ADLs) was weakly correlated ($r = 0.30$, $p = 0.03$).
- No correlation between overall FS-IS and FOIS scores.
- Weak correlation (p=0.36) between FS-IS's Worry Subscale and FOIS.
- Multiple linear regression analysis revealed no other caregiver characteristics that contributed to a greater FS-IS score.
- Cronbach alpha values for FS-IS were 0.86, 0.82, and 0.85 for the three categories, and 0.92 overall.

Figure 1. Correlation between FS-IS and FOIS scales



Discussion and Conclusion

- The FS-IS has poor correlation with PAS/FOIS scores.
- Impact on caregiver quality of life does not appear to directly correlate with findings on VFSS.
- Additionally, PAS is not a comprehensive assessment of swallowing dysfunction. An improved tool for standardizing VFSS interpretation is needed.
- The weak correlation between FS-IS Worry subscale and FOIS suggests a greater restriction in diet if a caregiver scores higher on the FS-IS.
- Future research should assess or develop other validated questionnaires which may serve as screening tools to predict presence and/or severity of dysphagia, potentially helping cut down cost and risk associated with workup.

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