Feeding and Swallowing Patterns in Children Receiving Early Feeding Intervention

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•Abstract. This retrospective research reviewed charts for 315 children receiving feeding and swallowing services before 3 years. Detailed checklists reviewed children's feeding and swallowing characteristics and interventions, as well as speech and language outcomes. Results indicate co-occurrence of patterns of neurological, behavioral, structural, and other impairments with intervention and outcome data.

•What kind of research was this?

- •Retrospective hospital chart review
- •Based on past research collected in feeding and swallowing clinics
- •Utilized medical records—incidence of two disorders that may co-occur with interventions including speech and language
- •Pilot research for prospective study—feeding and swallowing disorders predicting speech and language outcomes

•Why is such research important?

- •Early intervention—providing speech services earlier, based on previous medical interventions
- •Effective therapy—targeting skills in addition to feeding for children in high-risk groups
- •Scientific knowledge—rate of incidence of speech disorders in population
- •Family and clinician expectations of risk factors

•What do we already know?

- •Similar structures for feeding and speech (Kumin et al., 2001)
- •Limited reports of co-occurrence of disorders in some populations of children (Rvachew et al., 1999)
- •Failure of treating either speech or feeding to affect both disorders (Moore & Ruark, 1996)
- •Different control areas in brain for speech and feeding domains (Moore & Ruark, 1996)
- •Common clinical expectation of speech risk with feeding impairment in children—evidence needed (Burklow et al., 1998)

•What are our research questions?

- •What patterns of feeding and swallowing characteristics appear in children receiving feeding and swallowing services at ages 3 and younger?
- •Which types of feeding characteristics have higher co-occurrence with different intervention and speech/language outcomes?

•Methods

•Subjects

- •Met three criteria:
  - -Had feeding, swallowing, and/or GI services
  - -0-36 months of age at initial billing date
  - -First billing date in 2000 or earlier

- • Charts reviewed for 315 children (56% male, 44% female)
- • 84% Caucasian, 7% African-American, 2% Hispanic, 1% Asian-American, 2% Mixed/Other, 5% No Information
- • Had a mean age of 13.5 months at first date of service (range 0-45 months)
- • Seen in feeding and swallowing therapy for different lengths of time—Average of 25 months (Range 1-288 months)
- • Some were single assessments only.

•Procedures: Chart Selection

- •432 charts reviewed – 96 overage – 21 missing charts = 315 total files scored
- •Received feeding, swallowing, and/or GI services between 1997 and 2000
- •Underwent treatment at regional Midwestern medical center seeing most of the state
- •Chosen for feeding/swallowing or GI billing code
- •Entire medical histories unavailable—compartmental hospital files, interventions in home district rather than regional evaluation center

•Coding Checklist Development

- •Categories chosen by feeding and swallowing experts—What information would they like to know about feeding and swallowing services?
- •Subdivided list into categories—Demographics, Feeding and Swallowing Characteristics, Feeding and Swallowing Interventions, Speech and Language Outcomes
- •Criteria reviewed and edited by expert group

•Data Coding

- •4 researchers coding data from charts
- •Taught definitions of medical terms and feeding and swallowing chart characteristics
- •Trained on three "practice" files until at least 80% agreement
- •Reliability—double-scored periodically and coded for 30% of total files

•Reliability

- •Different coder examined and coded first researcher's file
- •Determined percentage of agreement (agreement/total agreement + disagreement)
- •Simplified original checklist to improve final agreement for interpretable data
  - -Removed items unrelated to feeding and growth,
  - -Collapsed closely-related items
  - -Double-coded all files of one insufficiently-trained coder
- •Average agreement across 30% of files = 80.27%

•Cluster Categories

--Children were identified as falling into one or more of 5 feeding classifications (Burklow et al., 1998), using the checklist categories described below:

•Structural Abnormalities—oral-facial anomalies, esophageal atresia, tracheoesophageal fistula, oral structural problems, tracheotomy

•Neurological Conditions—cerebral palsy, autism spectrum disorder, Down syndrome, inutero drug/alcohol use, traumatic brain injury, neuromotor problems (e.g. hypersensitivity), seizures

•Behavioral Issues—unspecified feeding behaviors (picky eater), experiential problems, nonorganic feeding behavior problems, inappropriate eating behaviors, inappropriate caregiver expectations

•Cardiorespiratory Problems—congenital heart disease, respiratory disorders, apnea, bradycardia, bronchopulmonary dysplasia, respiratory treatments excluding frequent respiratory illness (e.g. supplemental oxygen, tracheotomy, pneumonia)

•Metabolic Dysfunction—cystic fibrosis, feeding intolerance, phenylketonuria, other metabolic diagnoses

•Results/Discussion

Table 1: Diagnoses

•Failure to thrive, developmental delays, and esophageal reflux were the most common diagnoses.

•Prematurity, feeding intolerance, and respiratory disorders were also common diagnoses.

•Children frequently had additional diagnostic information listed, such as specific syndromes, unusual birth history, or medical conditions (e.g. tumors).

Table 2: NICU Effects

•42% of children stayed for a period of time in the NICU.

•Common risk factors from neonatal experience were microcephaly, bronchopulmonary dysplasia, and low/very low birth weight.

Table 3: Sensory Information

•Children had concerns or impairments in vision (25%) and in hearing (10%).

•50% of children had frequent ear infections, which is associated with risk for speech/language impairments.

Table 4: SLP Diagnoses

•The 2 most frequent diagnoses for children with speech and language concerns were language delays and cognitive impairments.

•Most types of speech/language diagnoses were represented in this population.

•Some SLP diagnoses, such as apraxia, are not typically diagnosed until close to school age, an age for which information was not available in most of these charts.

Table 5: Clusters and SLP Services/Developmental Delay

•68% of children had known developmental delays. Children with this diagnosis typically require SLP services during childhood, although many children in this database had no report of these services yet at the early ages charted.

•Children with neurological impairments in their cluster were more likely to have developmental delays and/or SLP services at or before the age of 5.

•27% of the children had already begun receiving SLP services at or before 5 years. Many of the remaining 73% of children may have had speech/language concerns that were not yet diagnosed at these early ages, or that had not yet received SLP services by ages charted.

Table 6: Clusters and Functional Symptoms

•A large percentage of all children had nutritional concerns (85%), digestive function problems (57%), and/or esophageal reflux (78%).

•Children with neurological impairments were more likely to have multiple feeding and swallowing functions impaired, particularly children with multiple factors involved in their clusters.

•Children without neurological involvement tended to have relatively frequent difficulties with nutrition, digestive function, aspiration, and esophageal reflux.

•However, children without neurological impairments also showed specific functional difficulties commonly assumed to affect risk for speech/language impairments, such as hypersensitivity, hyposensitivity, or oral transit problems (lip, jaw, tongue, and palate).

Table 7: Clusters and Feeding/Swallowing Intervention

•Almost all children across clusters received interventions addressing diet (95%) and feeding strategies (83%).

•Children with neurological involvement tended to receive multiple types of interventions to address multiple functional and structural concerns.

•58% of children received behavioral intervention, including behavior modification or direct services by a behavior specialist or psychologist. This was not limited to children with behavioral symptoms in their clusters.

•Common surgeries, such as fundoplications and tube insertions or removals, were distributed across clusters, including some for children with behavior, cardiorespiratory, or metabolic concerns only.

•Conclusions

•Children with neurological impairments and/or developmental delays demonstrated a known risk for speech/language impairments. However, children without neurological concerns demonstrated multiple structural and functional concerns that are commonly associated with speech/language concerns. This included children identified as having behavior concerns only.

• Specific oral function and sensitivity difficulties are possible factors that would contribute to suspected speech/language risk for children without neurological impairments. Only 4 of 315 children demonstrated strictly behavioral symptoms.

•Given high variability of symptoms and functional interventions received across children, it is insufficient to use the 5 feeding impairment categories (Burklow et al.,1998) alone to classify types of feeding/swallowing symptoms or speech/language risk.

•Further research is needed to identify feeding impairment clusters and/or symptoms associated with known, suspected, or limited risk for speech/language impairment.

•Given the limited information available from chart review about speech/language skills in children after they complete intensive feeding and swallowing services, future research needs to track children's skills prospectively to school age, particularly for children in suspected feeding and swallowing risk categories.

•References

Burklow, K.A., Phelps, A.N., Schultz, J.R., McConnell, K., & Rudolph, C. (1998). Classifying complex pediatric feeding disorders. *Journal of Pediatric Gastroenterology & Nutrition, 27,* 143-147.

Kumin, L., Von Hagel, K.C., & Bahr, D.C. (2001). An effective oral motor intervention protocol for infants and toddlers with low muscle tone. *Infant-Toddler Intervention: The Transdisciplinary Journal, 11,* 181-200.

Moore, C.A., & Ruark, J.L. (1996). Does speech emerge from earlier appearing oral motor behaviors? *Journal of Speech and Hearing Research, 39,* 1034-1047.

Rvachew, S., Creighton, D., Feldman, N., & Sauve, R. (1999, November). *Babbling and feeding abilities of infants with BPD.* Poster presented at the meeting of the American Speech Language-Hearing Association, San Francisco.

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