



Assessment and Treatment of Pediatric Feeding Disorders

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Topic

Eating behaviour

Introduction

A feeding disorder is identified when a child is unable or refuses to eat or drink a sufficient quantity or variety of food to maintain proper nutrition.¹ The complications of feeding problems range from mild (eg, missed meals) to severe (eg, malnourishment; and *failure to thrive* — a descriptive expression used to identify children whose growth has decreased over time).² Mealtime difficulties have been estimated to occur in approximately 25% to 35% of normally developing children and approximately 33% of individuals with developmental disabilities.^{3,4} However, these prevalence estimates should be viewed with caution since a feeding disorder may consist of many problems, including, but not limited to, a total refusal to eat, dependence on supplemental feedings (eg, through a gastrostomy tube [G-tube] — a tube that is inserted through the abdomen wall and into the stomach for feeding; or a nasogastric tube [NG-tube] — a tube that is inserted through the nasal canal), inappropriate mealtime behaviours, failure to thrive, and selectivity of food by type and texture, to mention a few.

Subject

The causes of feeding disorders are equally varied. The current consensus is that feeding problems are caused by a number of interacting biological and environmental factors.^{5,6} For example, Rommel et al. evaluated 700 children referred to an interdisciplinary feeding team and found combined causes (eg, medical, behavioural, oral motor difficulties) for the feeding problems in over 60% of patients.⁶

Biological factors may include early experiences with medical procedures, chronic hospitalization, or medical problems that cause eating to be painful. In addition, children may experience oral motor deficits (eg, difficulty swallowing) that make eating difficult. That is, eating may be associated with unpleasant consequences, such as vomiting (due to Gastroesophageal Reflux Disease — an irritation of the oesophagus [throat] by acidic fluid from the stomach, sometimes referred to as “heartburn”) or choking (due to oral motor difficulties), and may develop into a variety of behaviours (eg, crying, head turning) to avoid eating. Even after any one of the associated painful medical conditions

is treated, children may continue to refuse food since they never or rarely eat and therefore never learn that eating is no longer painful.

More specifically, children's *refusal to eat* contributes further to their failure to develop appropriate oral motor skills. That is, children do not have the opportunity to practice the skill of eating and thus do not develop the oral motor skills or strengths to become capable eaters. Refusal to eat may lead to failure to thrive. Ironically, *failure to thrive* contributes to poor feeding skills as undernourished children lack the energy to become capable eaters.⁷ Thus, a vicious cycle develops in which children refuse food, fail to learn that eating is no longer painful, miss opportunities to practice and develop oral motor skills, and fail to gain weight.

Problems

Even when the cause of food refusal is a painful medical condition, caregiver responses to children during meals may exacerbate the problem. Piazza and colleagues conducted observations of caregivers and children with feeding problems during meals.⁸ Observation of these meals showed that caregivers used a variety of strategies to encourage eating, such as distracting, coaxing, and reprimanding; periodically allowing children to take a break from or avoid eating; and providing preferred food or toys. All children displayed refusal behaviours and infrequently ate bites of food during these meals. When Piazza et al. analyzed the effects of caregiver behaviour during meals on child feeding behaviours, results indicated that the strategies used by the caregivers to encourage eating (ie, distraction, coaxing, allowing breaks from eating, or providing toys or preferred food) *actually worsened behaviour* in 67% of the children.⁸

These results are not surprising considering the relationship between the causes of feeding problems and caregiver behaviour. For example, when children's behaviour is problematic during meals, caregivers may stop the meal and wait for children to "calm down" before feeding. Caregivers also may provide increased attention (eg, coaxing) or preferred items (eg, toys) following food refusal or problematic mealtime behaviour. From a parental perspective, strategies such as stopping the meal or coaxing may produce the immediate effect of temporarily stopping the undesirable behaviour. Unfortunately, children may learn that when they cry and bang their spoons, caregivers may stop the meal, provide the child with additional attention in the form of coaxing, and/or try to distract them with preferred items. Thus, the study by Piazza et al. suggested that if refusal behaviours are rewarded with an outcome that is pleasing to children, they are likely to be repeated during subsequent meals. To wit, all of the children in the Piazza study had long-standing, serious feeding problems.⁸

Research Context

Literature on both the causes and the treatment of feeding problems is growing. Currently, treatment strategies with the most scientific support are based on behaviour therapy (also referred to as contingency management).⁹ Kerwin evaluated articles published in peer-reviewed medical and psychological journals between 1970 and 1997 targeting the treatment of oral feeding in children.⁹ In his review, Kerwin only evaluated studies that met the standards developed by scientists for determining whether a treatment

was effective. Using this guideline, only studies on behavioural interventions for feeding problems met this standard. The effectiveness of interventions based on other strategies could not be evaluated because these studies did not meet scientific standards. More specifically, treatments based on behaviour therapy (eg, not allowing the child to “get out of eating”) proved effective for increasing consumption in children with feeding problems and may be more effective than other strategies.¹⁰⁻¹⁶ For example, Benoit et al. randomly assigned 64 children diagnosed with feeding problems to either behaviour therapy or a nutritional intervention.¹⁶ Only children in the behaviour therapy group were able to discontinue tube feedings at the 4½-month follow-up.

Research Results

Because children have feeding problems for a variety of reasons, treatment should focus on all of the components (ie, biological, oral motor, and psychological) that contribute to feeding problems and should be interdisciplinary. One example of reported outcomes for 50 children admitted to an intensive, interdisciplinary day-treatment program at the Marcus Institute’s Pediatric Feeding Disorders Program in Atlanta, GA has been described by Cohen, Piazza, and Riski.¹⁷ Preliminary analysis of the outcome measures for the program indicated that over 87% of the goals for treatment were met by the time of discharge from hospital. When increases in calories consumed by mouth were the goal of treatment, 70% of patients reached their goal for calories consumed by mouth. When increases in liquid intake (for children who did not consume liquids by mouth) were the goal of treatment, 80% of patients reached their goal for oral liquid intake. All other patients increased solid or liquid intake after treatment was implemented, but did not reach their final goal during the day-treatment admission. The mean percentage of the intake by mouth goal met was 82% for all patients, suggesting that even when patients did not reach 100% of their oral intake goal, their levels of oral intake were increased substantially and reached within 20% of the goal. One hundred percent of patients met their goals for increasing texture, decreasing bottle dependence, increasing self-feeding skills, and increasing the variety of the foods they consumed.

Levels of feedings by tube (ie, NG-, G-tube) were decreased for all patients receiving their nutrition via tube and 70% of patients met their goals for decreases in feedings via tube. Patients who entered the program with a NG-tube either left the program without the tube (75%) or had the NG tube removed shortly after discharge (100%). Thus, surgical placement of a G-tube was avoided for 100% of patients who entered the program as candidates for G-tubes because of their failure to thrive and the use of a NG-tube at admission. The goals for decreasing inappropriate mealtime behaviours were met for 97% of patients. Eighty-eight percent of caregivers were trained to implement the treatment protocols with greater than 90% accuracy and the treatment was successfully transferred to the home and community in 100% of cases.

Conclusions

Preliminary analysis of follow-up data indicated that the majority of patients (87%) continue to be followed post-discharge from the day-treatment program. Follow-up data were collected at 3, 6, 12, 18, and 24 months post discharge. Of those patients who were followed, 85% continued to make progress toward age-typical feeding, which included

further volume increases, further G-tube decreases and G-tube removal, increases in the variety of foods consumed, texture advances (ie, pureed foods to table foods), initiation of cup drinking, and initiation of self-feeding.

Similarly, Byars, Burklow, Ferguson, O'Flaherty, Santoro, and Kaul presented data on outcomes for 9 children with G-tube dependence and Nissen Fundoplication (a surgical procedure used to treat reflux) in a behaviour-based, intensive interdisciplinary feeding program.¹⁸ Outcomes showed that the program was successful in increasing intake and decreasing G-tube feedings. Irwin, Clawson, Monasterio, Williams, and Meade showed that children with cerebral palsy and feeding problems improved in the number of bites accepted, weight, and height following intensive interdisciplinary treatment that they combined behavioural strategies and oral motor techniques.¹⁹ These data suggest that intensive, interdisciplinary programs that use behaviour-based treatments produce successful outcomes for the majority of patients treated. Preliminary data suggest that these outcomes are maintained during follow-up.¹⁷⁻¹⁹

Implications

Interdisciplinary, intensive treatment of pediatric feeding disorders are successful in improving a wide variety of feeding problems, including dependence on supplemental feedings (eg, G-tube, bottle dependence), selectivity by type and texture of food, inappropriate mealtime behaviour, failure to transition to age-appropriate textures of food, and failure to self-feed, to name a few. The successful treatment of these feeding problems has a number of important implications for children with feeding problems, their families, and society.

Long-term, chronic feeding problems are associated with the following results:

- a) Health risks for the children²⁰
- b) Increased perceived stress for children and families²¹
- c) Mental health problems in families²²
- d) Increased risk of eating disorders, such as anorexia²³
- e) Increased health care costs for children and families.

Therefore, treatment of pediatric feeding problems can result in

- a) Improved health in children
- b) Improved quality of life in children and families
- c) Decreased mental health problems in families
- d) Reduced risk of long-term eating problems (eg, anorexia)
- e) Reduced health care costs.

Obviously, children who are dependent on technology such as G-tubes for their nutritional needs have high health care costs. For example, the health care cost for a child with a G-tube is approximately \$46,875.55 for the first year. Over two years, the health care cost for such a child is estimated to be \$80,959.10 and after five years, the cost is \$183,209.80. These estimates apply to uncomplicated care (eg, no hospitalizations or other significant medical problems related to the G-tube or feeding disorders) and do not include costs associated with family or individual therapy required because of increased

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family stress or any of the psychopathology that has been documented in families of children with feeding problems. In actual fact, the health care costs for these children may extend over many years if G-tube for nutrition is needed or if eating problems such as anorexia develop later on. Intensive, interdisciplinary treatment of the feeding problem can eliminate the need for a G-tube and result in age-typical feeding, which ends the need for ongoing medical treatment in about 2 years. The estimated cost of intensive treatment for the feeding problem is approximately \$48,000 over 2 years. Thus, treatment of the feeding problems results in a savings of \$32,959.10 over a 2-year period and a cost savings of a minimum of \$135,209.80 over 5 years when compared to using a G-tube for the problem.

Thus, not only are there obvious quality-of-life improvements for children with feeding problems and their families, but also there are significant cost savings when feeding problems are treated using interdisciplinary approaches.

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