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Case Report

Fluoxetine Use for the Treatment of Anxiety-Induced Vomiting in 3-Year-Old Children with Complex Trauma and Developmental Concerns: A Case Report

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ABSTRACT

Background: Heightened anxiety often is seen in children with trauma histories and complex healthcare problems, and vomiting is a common anxiety reaction. Fluoxetine has demonstrated clinical safety and efficacy in pediatric patients. However, there are no published case examples of the pharmacological management of anxiety-induced vomiting in young children.

Case presentation: Cases involve two 3-year-old females with multiple health conditions and neglect, presenting with anxiety-induced vomiting. Fluoxetine was prescribed due to the anxiety-related gastrointestinal symptomatology and subsequently reduced vomiting and increased nutritional intake benefiting overall health.

Conclusion: Outcomes of these cases suggest the possible efficacy of fluoxetine even in young children with anxiety-related symptoms, including vomiting. Four justifications for off-label use of fluoxetine for the anxiety component of vomiting in young patients are described, including multifactorial approaches, evidence-based decision making, safety, and severity. Future directions and guidelines will be discussed.

Keywords: Anxiety; Vomiting; Trauma; Treatment; Fluoxetine

INTRODUCTION

Children with multiple health conditions and histories of trauma often display heightened anxiety reactions [1]. Clinical levels of anxiety in pediatric patients can present with gastrointestinal disturbances such as nausea and vomiting [2]. Young children with failure to thrive, nutritional deficits, and a history of child abuse and neglect are particularly at risk for serious complications with anxiety-induced vomiting, and this effect can be exacerbated in healthcare situations [3,4]. Fluoxetine is a selective serotonin reuptake inhibitor (SSRI) that is currently Food and Drug Administration (FDA)-approved for the treatment of Major Depressive Disorder, Panic Disorder, Obsessive Compulsive Disorder, and Bulimia Nervosa. Although not currently FDA-approved for treating young children with anxiety disorders, promising literature has indicated fluoxetine's empirical safety and efficacy for such treatment in pediatric patients [5,6]. Additionally, neurobiological and pharmacological models in anxiety development support the pathophysiology of SSRI use in this population [7]. Although limited emerging research suggests the potential usefulness of fluoxetine with young children, the current study expands the literature by examining outcomes of two similar presentations involving anxiety-induced vomiting in preschoolers with trauma histories.

CASE PRESENTATION

Patient A is a 3-year-old Caucasian female living in Appalachia with an adoptive family. She was referred from her primary care physician for specialty care in child psychiatry. Patient A presented at an outpatient surgical clearance appointment with severe vomiting related to healthcare anxiety. At the first appointment after referral, patient A weighed approximately 20 pounds, which is considered underweight for her age [8]. She had poor feeding with a gastrostomy tube placed. Additionally, patient A had behavior problems related to medical adherence to nutrition and tooth brushing, including screaming, crying, and refusing to feed. Patient A had experienced multiple previous hospitalizations, and she had a past medical history of *in utero* drug exposure, cerebral palsy, mitral valve prolapse, spinal dysraphism, hypothyroidism, and intellectual disability. Patient A had a history of failure to thrive, and she experienced extreme neglect by her biological

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parents, especially during her first three months of life. She was being followed by pediatric neurology, endocrinology, orthopedics, cardiology, and general pediatrics.

Patient A's treatment course was targeted at the apparent anxiety component to vomiting. 1 mg of fluoxetine daily was started at the outpatient surgery clearance appointment by a primary care physician in conjunction with a child psychiatrist. She was being treated for dental carries under general anesthesia. Patient was monitored closely for side effects of fluoxetine use by completing follow-ups. No side effects were reported. Patient A's vomiting ceased after starting fluoxetine, with only one episode of vomiting noted after beginning treatment. Oral feedings became more successful, with less anxiety noted as well. Fluoxetine was continued for three months, and on follow-up, the family stated that some gastrointestinal and anxiety symptoms had returned. Dose was increased to 3 mg at that appointment with good results seen, as patient A gained one pound at the next follow-up appointment one-month later. However, four months later, patient A's vomiting began to slowly return, and she was switched to Sertraline, titrated up to 80 mg. She is continuing to be monitored at regular follow-up appointments.

Patient B is another 3-year-old Caucasian female living in Appalachia. She has a history of sexual abuse, separation anxiety, and posttraumatic stress disorder. Patient B was living with her grandmother who was acting as her guardian, as her mother and mother's significant other had previously beaten patient B when they were homeless. She was hospitalized for vomiting and struggled with anxiety while an inpatient, manifesting as separation anxiety and worries about family, especially the health and safety of her sisters at home. Patient B had two prior hospitalizations for intractable vomiting as well. In addition to outpatient individual mental health services, 2 mg fluoxetine was started because of the relationship between the vomiting episodes and anxiety. As needed 1.25 mg hydroxyzine was also started, with patient B requiring daily administration. Vomiting decreased, and dosage was increased over time up to 8 mg as symptoms started to slowly return and increases appeared to be necessary. Of note, symptoms seemed to correlate with visits and calls with the biological mother. Patient B was able to tolerate anxiety-provoking situations better and displayed less separation anxiety.

RESULTS AND DISCUSSION

These two cases suggest four justifications for off-label use of fluoxetine for anxiety-induced vomiting in young patients. First, our results point to a multifactorial approach to prescribing fluoxetine for a pediatric population with complex medical concerns. For example, failure to thrive can be thought of as a multifactorial concept (Figure 1), being influenced by medical, nutrition, feeding skills, and psychosocial components [3]. Thus, approaching patient concerns in a multifactorial approach can help target underlying mechanisms for illness and behavior, such as the anxiety component of vomiting seen in the two cases. Second, when research is unavailable for rare, complicated cases, evidence-based decision making is needed [7]. Due to the complex medical history of some cases, off-label prescriptions of psychiatric medications may be warranted. Third, safety is the paramount consideration, with off-label prescribing requiring close monitoring. Research does support that fluoxetine is safe for short-term use in children [5]. However, SSRI use in child and adolescent psychiatry remains controversial. The Food and Drug Administration released a Black box SSRI warning for children that states that use may lead to increased suicidal ideation. Research suggests this is less of a concern with fluoxetine use with very young children, however, physicians should consider this warning for all pediatric cases prior to starting any SSRI [5,9,10]. Lastly, off-label prescriptions must be considered in the context of the severity of the presenting complaints and the potential side effects.

Two seemingly paradoxical treatment effects were noticed in these cases. First, gastrointestinal side effects are notoriously common in SSRI medications [11]. Treating anxiety-induced vomiting with a class of medications that is known to possibly cause additional gastrointestinal symptoms may seem counterintuitive. However, these side effects have been shown to be relatively tolerable in children [12]. The anxiety contributing to the vomiting episodes may support treatment of the emotional state in these patients, even with medications known to negatively impact gastrointestinal function. The second paradoxical effect is that SSRIs are known to take weeks to months for full efficacy, so short-term treatment of anxiety-induced vomiting with SSRIs may seem ineffective. Our case report results point to SSRIs being helpful even in periods of time less than six months in similar cases. Related to the first paradox, treatment of the anxiety component to vomiting may be paramount, even in short periods of time. Additionally, the association of vomiting with healthcare and trauma supports a psychiatric intervention in addition or instead of a gastrointestinal one.

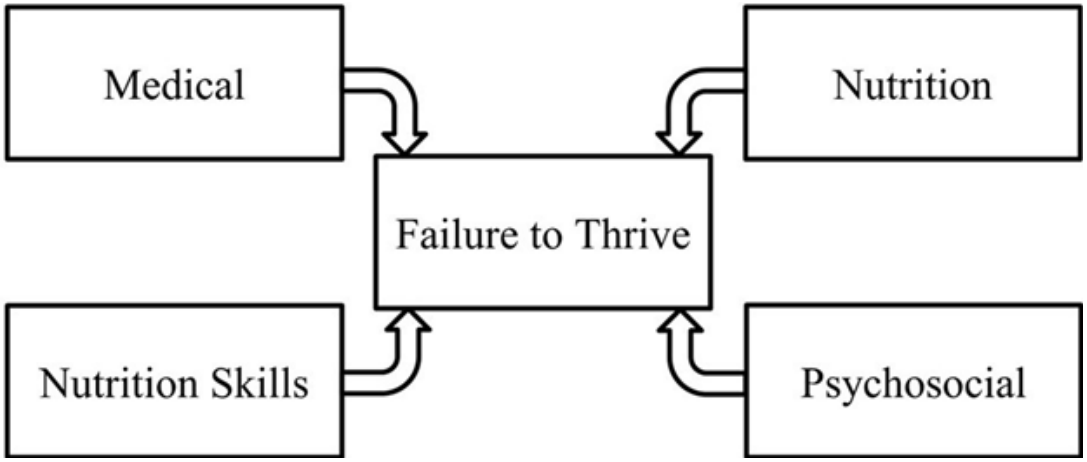

Figure 1: Multifactorial approach for conceptualizing failure to thrive based on framework from Mazze and colleagues (2019).

Fluoxetine was switched to Sertraline after seven months for patient A. While fluoxetine demonstrated a clinically significant improvement in anxiety, vomiting, and oral feedings initially, symptoms began to return months later. Dosage increases initially helped, but ultimately the decision was made to change to Sertraline to try a different SSRI. For patient B, dosage increases consistently helped when symptoms began to return. These findings align with prior research that fluoxetine is effective for short-term treatments for anxiety-related concerns in children [12]. For symptoms that return or remain consistent after several months of treatment, additional evidenced-based support by physicians may be needed to determine next steps in treatment, such as trying a different SSRI as in patient A.

CONCLUSION

The two case studies did not involve experimental control; therefore, the interpretation of the outcomes must be considered preliminary and speculative. To fully understand the usefulness of SSRIs with young children, future research is needed that includes single subject research designs, additional case reports, randomized controlled trials, and systematic reviews of the literature on SSRI use in young children with anxiety-related behaviors. The topic of anxiety-induced vomiting in children is underrepresented in current research, especially as it relates to trauma and developmental concerns. Cumulative research efforts may inform future practice and FDA guidelines for treatment of anxiety in children.

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DECLERATION

Ethics approval and consent to participate

Marshall University Office of Research Integrity and Institutional Review Board view all case reports as educational and are granted automatic exempt status without IRB submission for individual reports.

CONSENT FOR PUBLICATION

The patient caregivers did give verbal consent for the reports of their children's cases prior to the writing of this manuscript.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

DM performed literature review and contributed to the creation and editing of the manuscript. DP contributed to the creation of the manuscript and facilitated much of the editing process. MB and HP were clinicians on the cases and contributed to the formation and editing of the manuscript. All authors are responsible for the entirety of the content within the manuscript.

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