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Case Report
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A Rare Case of an Adolescent with CMV Post-Infectious Gastroparesis

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Abstract

Introduction: Post-infectious gastroparesis is a rare disorder of delayed gastric emptying without an obstruction, in the presence of a recent infection. It is rarely diagnosed in previously healthy adolescents. Once a diagnosis is confirmed, it is important to start treatment promptly and aggressively in order to provide a relief of symptoms.

Case Report: A 15-year-old girl, without any previous gastrointestinal complaints, presented with symptoms of epigastric pain, nausea, vomiting, and gradual weight loss of up to 30% of her initial body weight. She underwent extensive workup in search for a more common infectious, inflammatory, neoplastic, and psychiatric condition; all ruled out except for evidence of a recent CMV infection and delayed gastric emptying. Initiation of prokinetic treatment with Domperidone resulted in a quick cessation of symptoms. In repeated outpatient follow-up visits she was free of symptoms even after the treatment course has ended.

Conclusion: Post-infectious gastroparesis is a rare diagnosis in adolescents that can be confused with numerous other organic and psychiatric conditions. Early diagnosis and treatment can provide relief of symptoms and prevent severe morbidity and even mortality.

Abbreviations

GP: Gastroparesis; PIGP: Post Infectious Gastroparesis; BMI: Body Mass Index; SOL: Space Occupying Lesions; PCR: Polymerase Chain reaction; EBV: Epstein Bar virus; CMV: Cytomegalovirus; PZ: Per Zonda; GES: Gastric Electrical Stimulation; PPI: Proton Pump Inhibitor; CT: Computed Tomography

Introduction

Gastroparesis (GP) is a rare disorder of delayed gastric emptying in the absence of an obstruction. Known causes are diabetic-neuropathic and idiopathic gastroparesis [1,2]. Post-Infectious Gastroparesis (PIGP) is a subgroup of idiopathic gastroparesis and a condition rarely diagnosed in children and adolescents of a normal medical background. Management is often extrapolated from short series of adult PIPG, as well as treatment recommendations of diabetic GP in adults [3,4]. These suggestions, in turn, are based on our limited pathophysiological understanding of this condition and good common sense, but they have not been validated by appropriate studies [2]. PIGP presents several weeks after a self-limited viral infection, often reported as "unremarkable". Symptoms include nausea, vomiting, early satiety, postprandial fullness, bloating, upper abdominal pain, and weight loss [3]. Without treatment, some report symptoms improve after 6 to 24 months [5,6], but others report longer-lasting symptoms with significant levels of morbidity and even mortality [7]. Management is challenging, especially in the absence of specific treatment guidelines, controlled studies, and presumed different pathophysiological mechanisms than those of adult diabetic GP. Treatment options begin with dietary modifications (avoiding large, high-caloric, fatty meals, and reducing the dietary fibers intake). Total parenteral nutrition is required when hydration and nutritional state cannot be maintained. Most adults with PIGP will require prokinetic and/or antiemetic medications, the choice of drug is determined by local availability, side effects profile, and clinician's and patient's choice [8]. Drugs used are mainly Metoclopramide [9], Erythromycin [8], and Domperidone [8], which differ in availability, mechanisms of action, and safety profile. In case of failure, other therapeutic options include Gastric Electrical Stimulation (GES), botulinum toxin, and endoscopic pyloromyotomy, reported in adults with diabetic GP [8,10,11].

Case Presentation

A previously healthy 15-year-old adolescent girl was first admitted to the pediatric ward in

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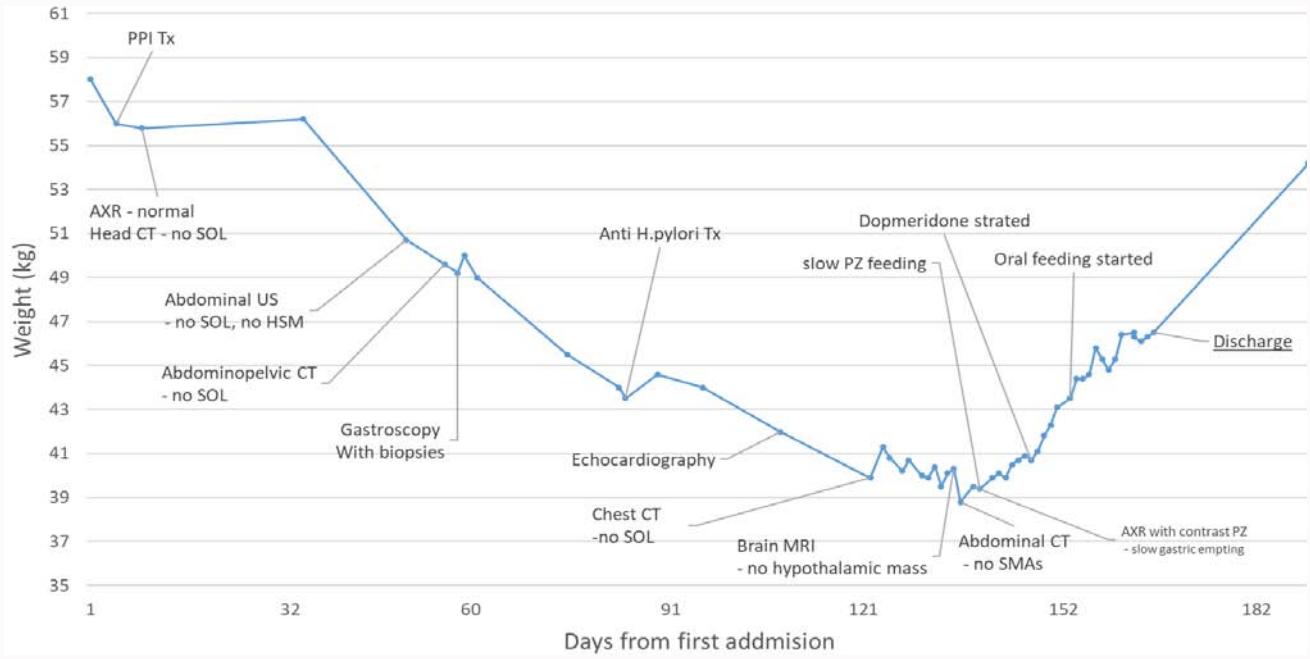

Figure 1: Weight Changes across time.

August 2021, with a chief complaint of continuous epigastric pain, described as heartburn-like, and 5 to 6 episodes of vomiting a day, that started 6 days before the medical encounter. She weighed 58 kg, with a Body Mass Index (BMI) of 24.8. She later reported secondary amenorrhea. Her medical history was significant for congenital pulmonary artery stenosis that was treated by balloon-valvuloplasty during her first days of life. While initial work up was started, treatment with proton pump inhibitors PPI's and intravenous fluids was started, and by the 6th day of hospitalization she reported an improvement in symptoms and was discharged. During the next 5 months, she was repeatedly admitted to the hospital due to epigastric pain, vomiting, and gradual weight loss, with a minimum weight of 39.4 kg (Figure 1). She underwent several psychiatric examinations that ruled out restrictive eating disorders, body dysmorphism, or emotional triggers for her symptoms and no stressful event in the months leading up to her illness was detected. Prior to her illness, she was an active 10th-grade student but stopped attending school after she became ill. During her hospitalizations, she underwent an extensive etiologic evaluation that included imaging studies, including abdominal, chest, and head CT scans to identify Space Occupying Lesions (SOL) and a brain MRI in search of a hypothalamic lesion. On echocardiography there were no signs of residual valvular disease, but she did develop thinning of the ventricular walls, typical of malnutrition [12]. She underwent an Esophagogastroduodenoscopy without macroscopic evidence of peptic disease, a gastric-antrum biopsy was positive for Helicobacter Pylori by immunostaining, so she was treated for the infection, and eradication was confirmed with a negative stool antigen test. Eradication of H. Pylori did not relive any of her symptoms. A stool was also negative for occult bleeding and thyroid function tests were normal. There was no elevation of inflammatory markers including C-reactive-protein and erythrocyte sedimentation rate, a rheumatologic panel, comprising anti-neutrophil cytoplasmic, anti-smooth muscle, and anti-nuclear antibodies, were all negative. Immunoglobulin levels (IgG, IgM, IgE, IgA) were all within normal limits. Levels of vitamin D were low, a common finding among

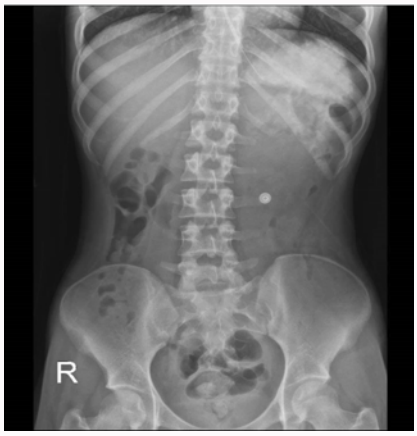

Figure 2: Plain abdominal X-ray 60 min after PZ injection of contrast media.

teenagers who wear a hijab [13], and replacement treatment was started. During acute episodes of vomiting, she developed a hypokalemic metabolic-alkalosis, which was corrected when she stopped vomiting. There were no other electrolyte disturbances at this stage and a transient elevation in hepatocellular enzymes was observed (up to five times normal values). Viral serologic tests for hepatitis A, B, C, E were negative. Polymerase Chain Reaction (PCR) for both Epstein Barr Virus (EBV) and *Cytomegalovirus* (CMV) were negative, with evidence of a past EBV infection and a recent CMV infection, with both a positive IgG in high titer throughout these months and a positive IgM with titers lowering during the illness. Serology tests showed evidence of a recent CMV infection, without an active infection (negative CMV PCR), and pointed to the possibility of post-viral gastroparesis, a condition rarely diagnosed in previously healthy individuals and even more so in adolescents. An abdominal X-ray 30 and 60 min after nasogastric (PZ) injection of contrast material revealed almost no progression of gastric content (Figure 2) and was followed by another vomit us. She was treated with

slow, continuous PZ feeding that caused abdominal pain and nausea when it exceeded 40 ml/h. She was then started on prokinetic therapy with Domperidone. The treatment resulted in a rapid disappearance of symptoms. PZ feeding was gradually increased and later replaced by oral feeding, with careful monitoring for signs of refeeding. She was advised to avoid large high-caloric fatty meals and to limit dietary fibers intake [2]. She was discharged 19 days after beginning treatment, weighing 46.5 kg (6.9 kg weight gain, Figure 1), free of symptoms, and eating orally, only. On follow-up visits she reported no gastrointestinal symptoms, a return of menstruation, and weight gain. PPI and Domperidone were gradually phased out, without a return of symptoms. She returned to school and reported no physical or social limitations.

Conclusion

This is a rare case of post-infectious gastroparesis after an infection with CMV in an adolescent girl that presented with nausea, vomiting, and epigastric pain, as well as gradual weight loss of up to 30% of her initial weight. After 5 months of persistent symptoms, and evidence of a recent CMV infection and slow gastric emptying, treatment with Domperidone was started, 10 mg three times a day. This drug was chosen as the first line of therapy among prokinetic-antiemetic drugs due to its availability and safety profiles. Shortly after treatment began, she felt a relief of symptoms, return of appetite, and started gaining weight. Although the condition can be self-limited, symptoms can be severe and even fatal, and thus must be monitored very carefully and requires prompt, aggressive medical intervention. Treatment options are limited and are mostly adapted from the management of adults with diabetic or idiopathic GP. These options include dietary modifications, prokinetic and antiemetic medication. Selected cases with a normal upper endoscopy in the absence of alarming features are candidates for a short-term course of a prokinetic agent. In refractory cases, GES is another safe but less commonly used mode of treatment. Although PIPG is rare, especially in the pediatric population, it is important to understand and consider this diagnostic option, especially in patients with evidence of a recent infection. In an adolescent complaining of weight loss, nausea, vomiting, and epigastric pain, one must first rule out diagnoses such as an acute infection, SOL, or an eating disorder. Consideration of PIGP and early initiation of treatment could potentially reduce symptoms and alter the disease progression and complications.

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