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A Rare Case of Iron-Pill-Induced Gastritis in A Pediatric Patient

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ABSTRACT

Iron deficiency is the most common mineral deficiency worldwide and iron is the most common mineral ingested orally as pills (Hashash, 2013). Cases of Iron pill-induced gastritis are not commonly reported in the general pediatric population. We report the case of a 12-year-old Pakistani girl, who presented with increasing epigastric pain and refusal of oral intake. Endoscopy and histopathological analysis revealed iron pill-induced gastritis. The case highlights the potential for gastrointestinal complications in patients on oral iron therapy and underscores the importance of monitoring patients on oral iron therapy, especially those with a history of renal transplantation.

Keywords: iron-pill-induced gastritis; iron supplementation side effects; gastric mucosal injury; drug-induced gastritis.

INTRODUCTION

Iron pills are a common medication used in the treatment of patients with iron deficiency anemia especially in cases of patients with post-transplant anemia due to end-stage kidney diseases. However, long use of iron pills can have adverse side effects such as nausea, vomiting, diarrhea, and abdominal pain. Moreover, patients could even present to the ER with the presentation of iron overload or severe gastritis due to gastric siderosis (Tenenbein, 1999). Gastric siderosis is characterized by iron deposition in the gastric mucosa, which can lead to epithelial damage and inflammation (Kothadia, 2016)[3]. Iron-pill-induced gastritis due to gastric siderosis is being recognized as an under-reported cause of abdominal pain and general GI symptoms.

This case underscores the importance of early identification and management of this condition to prevent prolonged morbidity. Iron deficiency remains a major global health issue, with the World Health Organization (WHO) estimating that it affects about 2 billion people worldwide, particularly women, children, and those with chronic illnesses like CKD. WHO reports 273 million children were affected in 2011 (The global prevalence of anaemia 2011, 2015). WHO has set guidelines for daily iron intake for pediatric patients, yet complications from oral iron supplementation, especially at higher doses, include gastrointestinal symptoms such as nausea, vomiting, constipation, and severe conditions like iron pill-induced gastritis (Tenenbein, 1999). This condition can lead to significant morbidity due to chronic inflammation from iron deposition in the gastric lining, known as gastric siderosis, which can further result in peptic ulcers, gastric perforation, or bleeding if left untreated (Jiten, 2016).

Additionally, long-term use of high-dose iron supplements poses a risk of systemic complications like iron overload, oxidative stress, and damage to organs such as the liver and heart (Tenenbein, 1999). Therefore, early detection of iron-related gastrointestinal complications and careful management of iron therapy are crucial to preventing prolonged morbidity.

CASE PRESENTATION

A 12-year-old Pakistani girl, with a history of a renal transplant at the age of 8 due to congenital abnormalities of the kidneys and urinary tract (CAKUT), presented with a two-week history of progressively worsening epigastric pain. The pain was described as constant, dull, and localized to the upper abdomen, with exacerbation following oral intake. Due to the increasing discomfort, the patient had been refusing to eat, resulting in decreased oral intake and weight loss over the last few days. There was no history of vomiting, hematemesis, melena, or bowel habit changes. The patient and her family denied the use of nonsteroidal anti-inflammatory drugs (NSAIDs) or other medications known to cause gastrointestinal irritation.

Her past medical history was significant for a renal transplant, performed at age 8 for end-stage kidney disease due to CAKUT, for which she was maintained on long-term immunosuppressive therapy, including tacrolimus and prednisone. Patient was diagnosed with iron deficiency anemia 4 months ago, for which she was started on ferrous sulfate with sodium ascorbate medication. The patient had been compliant with her iron therapy, though she had experienced some mild gastrointestinal discomfort, which had recently worsened.

On physical examination, the patient appeared well-nourished but in mild distress due to epigastric pain. She was afebrile, with stable vital signs, and her cardiovascular and respiratory examinations were unremarkable. Abdominal examination revealed tenderness localized to the epigastrium, with no guarding or rebound tenderness. There were no palpable masses, hepatosplenomegaly, or signs of ascites. The rest of the systemic examination was within normal limits.

Laboratory investigations done one week before endoscopy showed borderline anemia, with a hemoglobin level of 115 g/L (normal range: 125–170 g/L) and hematocrit of 0.32 L/L (normal range: 0.37–0.49 L/L). The mean cell volume (MCV) was at 96 fL (normal range: 78–94 fL). Serum ferritin was elevated at 155 µg/L (normal range: 20–100 µg/L), consistent with iron overload, while serum iron levels were low at 5 µmol/L (normal range: 7–25 µmol/L). Transferrin and transferrin saturation were also reduced at 34 µmol/L (normal range: 20–41 µmol/L) and 9% (normal range: 12–45%), respectively, indicating iron deficiency despite adequate iron stores. These results suggested that the patient had poor absorption or improper utilization of the oral iron therapy.

Due to the persistence of her symptoms and her history of iron supplementation, the decision was made to perform an upper gastrointestinal endoscopy. Endoscopy showed signs of gastritis such as thickened gastric folds and erythema. Moreover, exudates were found in the gastric antrum and duodenum regions suggesting a diagnosis of gastritis. Active bleeding was not observed. Histopathological examination of biopsies showed inflammatory changes and brown deposits in the gastric antrum. Further staining with Prussian blue staining confirmed iron deposits.

Iron deposits are thus suggestive of gastric siderosis. Importantly, there was no evidence of *Helicobacter pylori* infection, a common cause of gastritis, and no signs of malignancy were detected. Given the patient's history of iron supplementation, these findings were highly suggestive of iron pill-induced gastritis, with gastric siderosis contributing to the mucosal inflammation and symptoms (Abraham, 2023).

The patient was then diagnosed with iron pill-induced gastritis, iron supplements were stopped, and the patient was commenced on omeprazole 20mg and iron transfusion before discharge. Symptoms resolved after 2 days and a follow-up after 2 weeks confirmed complete resolution from iron pill-induced gastritis after iron pill cessation.

DISCUSSION

Iron-pill-induced gastritis (IPIG) is a condition caused by excess consumption of oral iron pills. It is often an underreported diagnosis especially in the pediatric population due to limited history taken from patients.

Mechanism of action in IPIG involves oxidative damage to the gastric mucosa leading to gastric mucosal ulceration. The prevalence of IPIG is around 7 in every 1000 adults and around 16 in every 1000 children taking iron supplements (Abraham, 1999).

Iron is an important supplement for post-transplant patients. This is because anemia has been associated with kidney transplant patients in up to 80% of the cases. Thus, routine iron investigations are done in patients after undergoing a transplant surgery as anemia can have an early presentation post-transplant or later in life (Mudge, 2009). Iron deficiency anemia is associated with high mortality risk, particularly in children (Vinke J. , 2021). The leading cause of death because of iron deficiency in post-transplant patients is often associated with cardiovascular events. (Zheng, 2008).

Gastric siderosis is an accumulation of iron in the gastric mucosa due to excess iron intake. It is associated with oral iron pills, hemochromatosis, alcohol abuse, etc. Usually, it is asymptomatic however in some cases it can present with GI symptoms such as nausea, vomiting, diarrhea, or even serious GI manifestations such as hematemesis and melena. Gastric siderosis leads to gastric mucosa inflammation causing gastritis symptoms, particularly in patients taking iron pills for iron deficiency anemia. Long-time usage of iron pills is the leading cause of gastric siderosis due to the buildup of iron deposits in gastric mucosa which can be seen on histological examination. Moreover, Ferrous sulfate is the leading cause of gastric siderosis in most cases (Tun, 2022). Patients with gastric siderosis can present with symptoms such as nausea, vomiting, abdominal pain, weight loss, and in some cases more serious symptoms such as hematemesis. Diagnosis of gastric siderosis relies on histological examination of gastric mucosa. Histological examination can show brown deposits in the gastric mucosa. These iron deposits look brown in color and can be confirmed by Prussian blue staining. Endoscopy is usually performed in these patients which shows thickened gastric folds, erythema, and ulcerations. Differential diagnosis could include Helicobacter pylori infection thus It is also important to rule out H. pylori in these patients (Kothadia, 2016).

Cessation of oral iron and supplementation by Intravenous iron is usually the management method in patients with IPIG. IV iron can bypass the gastrointestinal tract which is particularly important in patients with gastric irritation. Moreover, patients are also started on PPIs to treat symptoms of gastritis caused by damage to gastric mucosa. In some cases, iron chelation is also considered if patients are in iron overload status or if patients IPIG was due to hemochromatosis (Jiten, 2016). Iron-pill-induced gastritis cases are limited in the pediatric population however some cases in adults followed a similar pattern of management and follow-up.

For example, , Zhang et al. (2017) described the occurrence of severe gastritis and gastric siderosis in an elderly patient on long-term ferrous sulfate therapy for chronic anemia, with symptoms resolving following cessation of the iron supplement. Similar findings have been reported by Morris et al. (2018) in an adult renal transplant recipient, underscoring the increased vulnerability of patients with a history of renal disease and immunosuppression to iron pill-induced gastrointestinal side effects.

In conclusion, this case illustrates the importance of recognizing iron pill-induced gastritis as a potential side effect in patients on oral iron therapy, especially those with pre-existing conditions like renal transplantation. Early diagnosis and treatment can lead to rapid symptom resolution and prevent further gastrointestinal complications.

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