Proton pump inhibitors induce hemolytic anemia

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ABSTRACT

Proton pump inhibitors (PPIs) are generally safe, and their short-term use commonly does not induce hemolytic anemia. The underlying mechanisms are unknown, and the literature insufficiently explores hemolytic anemia as an adverse event induced by PPIs. In this case study, we report a 31-year-old female who had developed hemolytic anemia with symptoms of jaundice, hyperbilirubinemia, and high reticulocytes, after treatment with PPI. Interestingly, the patient completely recovered after PPI withdrawal. This present case study highlights the need for physicians to exercise caution when treating patients with PPI.

Keywords: Adverse event, hemolytic anemia, proton pump inhibitors

Introduction

Proton pump inhibitors (PPIs) are commonly used drugs to treat gastric acid-related disorders and other diseases such as peptic ulcer, Helicobacter pylori infection, and gastroesophageal reflux disease. PPIs are highly recommended as prophylaxis for patients that undergo gastric balloon procedure, a new treatment modality for obesity to reduce the risk of developing peptic ulcer disease. PPIs treat gastric acid-related disorders by reducing gastric acid production. Primary mechanism involves inhibition of hydrogen potassium ATPase in the parietal cell, which is responsible for gastric acid secretion. Long-term use of PPIs results in many adverse events; however, short-term adverse events are rare.[¹-³]

Case History

The patient, a 31-year-old female, with a history of PPI-induced hemolytic anemia—PPI related was treated in this case study. The patient had undergone gastric balloon treatment for obesity, 4 years ago in King Fahad University Hospital, complicated by an attack of hemolytic anemia, with symptoms of reticulocytosis, low hemoglobin, and hyperbilirubinemia which manifested as yellowish discoloration of her skin, upper bulbar conjunctiva, palms, and soles. She recovered after withdrawal of PPIs that are routinely used as a prophylactic in gastric balloon treatment. We took an informed consent from the patient to take further required procedures. In the present study, the patient exhibited previously observed symptoms, namely jaundice and dark urine, after undergoing a second gastric balloon treatment treated with a Pantoprazole 40 mg OD.

During the physical examination the patient was conscious, and oriented with bright conjunctival icterus and the rest of the examination was unremarkable. Blood and Urine analysis were done and revealed: (i) hemoglobin = 9.4 g/dl (11.5-16.5 g/dl), (ii) absolute reticulocyte count = 97,000, (iii) reticulocyte percent = 7.8%, (iv) Coombs’ test = negative, (vi) total bilirubin = 31 µmol/L (2-21 µmol/L), (vii) direct bilirubin = 4 µmol/L, (viii) alkaline Phosphatase = 58 U/L (35-104 U/L), and (ix) alanine Transaminase = 26 U/L (0-33 U/L) [Chart 1]. Ultrasound examination was normal [Figure 1], and an upper esophagogastroduodenoscopy confirmed the correct position of the gastric balloon [Figure 2]. Additionally, no stigmata of portal hypertension were observed. The patient's

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treatment was managed by the withdrawal of the PPI. Interestingly, the yellowish discoloration resolved successfully, and the total bilirubin levels returned to the normal range (18 µmol/L).

Discussion

PPIs are commonly used as a prophylactic measure for patients that undergo gastric balloon treatment to prevent the development of peptic ulcer disease. Generally, short-term use of PPIs is considered safe. However, long-term use leads to many adverse events including hip fractures, ischemic heart disease, renal failure, Clostridium difficile infection, pneumonia, hemolytic anemia, thrombocytopenia, hypomagnesaemia, etc. These side effects are critical and might lead to life-threatening consequences.[1,4-7]

Based on the observations of our patient and the exclusion of other causes, we concluded that there was a strong relationship between PPI and the symptoms of hyperbilirubinemia and high reticulocytes. However, the exact mechanisms are still unknown and need further research to elucidate the underlying cause of PPI-induced hemolytic anemia.

Finally, it is very important that clinicians are aware of the potential complications produced by PPIs, especially for a long-term use.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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