CASE REPORT

Profound opiate toxicity in gastroparesis following therapeutic dose

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SUMMARY

Gastroparesis is defined by the presence of delayed gastric emptying without mechanical obstruction. Patients may present with severe discomfort that can mimic an acute abdomen including abdominal pain, vomiting, nausea, bloating, fullness and early satiety. The prevalence of gastroparesis is estimated at 24 per 100 000 and women are more commonly affected than men. It is associated with a number of conditions including diabetes, Parkinson's disease, multiple sclerosis, previous abdominal surgeries and connective tissue disorders, including scleroderma and Ehlers-Danlos syndrome. Drugs known to prolong gastric transit time, such as opiates, have been shown to exacerbate symptoms. We report a case of a 20-year-old woman with Ehlers-Danlos syndrome who developed respiratory depression after being administered a therapeutic dose of morphine. This occurred due to opiate toxicity confounded by gastroparesis. The patient required further support from intensive care until she recovered, and eventually underwent a gastric pacing procedure for symptomatic relief.

BACKGROUND

Gastroparesis is a poorly understood, chronic condition that can be debilitating.^{1 2} It is defined by the presence of delayed gastric emptying without mechanical obstruction. In the majority of cases, the aetiology is idiopathic, however, certain conditions have been implicated, including diabetes, Parkinson's disease, multiple sclerosis, previous abdominal surgeries and connective tissue disorders, including scleroderma and Ehlers-Danlos syndrome. Additionally, medications such as opiates may further exacerbate the symptoms by prolonging gastric emptying and should be avoided where possible. Patients may present in extreme distress and gastroparesis should be considered in the presence of symptoms including nausea, retching, vomiting, abdominal pain, bloating and early satiety. If left untreated, gastroparesis can lead to complications such as dehydration and malnutrition.² It is therefore important to recognise this condition so patients can be evaluated and managed appropriately. We describe an interesting case of gastroparesis in a patient with Ehlers-Danlos syndrome, where delayed gastric transit resulted in profound opiate toxicity despite the therapeutically administered dose of morphine.

CASE PRESENTATION

A 20-year-old woman was admitted to the emergency department, with sudden onset central

abdominal pain and vomiting at 19:30. She had a background of Ehlers-Danlos syndrome type 3 and was recently diagnosed with gastroparesis—extremely delayed gastric emptying as confirmed by C-13 breath test motility studies (transit time >150 min)—and was awaiting a gastric pacemaker procedure. She had undergone multiple previous admissions with severe abdominal pain relating to her condition. On examination, her initial vital observations were stable, and a long-term nasojugal (NJ)-feed was in situ for management of gastroparesis and epigastric tenderness but no guarding or rigidity was reported.

The patient received 2.5 mg intravenous morphine at 22:10 in the emergency department, and later at 02:20 received 20 mg oramorph (administered orally, not via NJ-tube) on the surgical ward for management of abdominal pain.

An arrest call was put out at 07:40. Observations: respiratory rate 0, 19% saturation on air, heart rate 100, blood pressure 168/111, bilateral pinpoint pupils.

Initial blood gas—pH 6.85, pO₂ 8.9, pCO₂ 16, HCO₃⁻ 21, base excess -12, lactate 4.7.

The patient was not known to be opiate-sensitive and had previously taken similar doses and preparations of opiates without ill effect. It is further notable that the initial 2.5 mg intravenous dose did not produce significant cardiorespiratory compromise. However, when taken in the oral preparation some hours later, the effects of opiate toxicity were profound. The degree of hypercarbia and acidosis on the arterial blood gas also demonstrated that the patient had experienced a prolonged period of respiratory depression by that time.

INVESTIGATIONS

Given that the diagnosis of gastroparesis had been established by previous investigations, no further investigation was deemed necessary.

DIFFERENTIAL DIAGNOSIS

On the basis of history, examination and investigation findings, the differential diagnoses included respiratory depression due to opiate toxicity. Other differentials to be considered on initial presentation given the chronic nature of the condition can include functional disorder, rumination syndrome and cyclical vomiting syndrome.

TREATMENT

The patient was given a bolus of intravenous naloxone—an opiate antagonist, with instant effect. She

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was eventually transferred to the intensive care unit for further supportive management.

OUTCOME AND FOLLOW-UP

The patient went on to make a full recovery, her diagnosis was explained to her in detail and a few months later she underwent a gastric pacing procedure to help with the symptomatic relief of her condition.

DISCUSSION

Gastroparesis can be a severely debilitating and painful condition that is often overlooked. It is important to recognise this condition because of the long-term biopsychosocial implications for these patients. In a large population-based study, Hasler *et al*⁴ identified 3604 potential cases of gastroparesis and, of these, 83 fulfilled the diagnostic criteria for definite gastroparesis. Their findings suggested that the overall survival for patients with gastroparesis was significantly lower compared with that of the general population once demographics such as age and sex were matched.⁴

The aetiology of gastroparesis remains unclear in most cases, as often no detectable underlying pathology can be identified.³ Several conditions may cause gastric stasis and consequently contribute to this condition. These include diabetes, Parkinson's disease, multiple sclerosis, previous abdominal surgeries and connective tissue disorders, including scleroderma and Ehlers-Danlos syndrome, as well as use of drugs known to prolong gastric transit time, such as antimuscarinics, dopamine agonists and opiates.^{2 4}

Diagnosis of gastroparesis is reached once mechanical obstruction has been excluded by clinical evaluation. Mechanical obstruction may be ruled out using endoscopy or imaging studies. This is followed up by gastric motility studies including scintigraphy, wireless motility capsule and C-13 breath test, which may reveal delayed gastric emptying and confirm the diagnosis of gastroparesis. Once the diagnosis is established, the suspected aetiology can be determined using further tests as considered appropriate.

Patients with gastroparesis may be initially managed using conservative measures such as dietary modification, and maintaining hydration and glycaemic control. Failing these, pharmacological, decompression and surgical options may be considered. The majority of pharmacological therapies for gastroparesis include a variety of prokinetic agents such as metoclopramide, cisapride, domperidone and erythromycin.⁵ Patients with refractory symptoms, recurrent hospitalisations and significant weight loss, may require nutritional support alongside pharmacological therapies in the form of enteral feeding and decompression via jejunostomy or a venting gastrostomy tube.⁵

Surgical options such as gastric pacing, pyloroplasty and gastro-jejunostomy should be considered as a last resort in patients with intractable symptoms despite optimal medical treatment lasting longer than a year.⁵

Several medications have been implicated with exacerbation of symptoms of gastroparesis, however, limited cases have been published that reveal the impact of opiates in such patients. Our case demonstrates opiate toxicity in a young woman recently diagnosed with gastroparesis. She was on enteral feeding with recurrent hospital admissions demonstrating the severity of her condition. Failure to factor in the significant impact that opiates could have on this patient led to a respiratory arrest. This case calls for attention of healthcare professionals to practise safe prescribing due to the unpredictable pharmacokinetics of medications such as opiates while managing patients with gastroparesis.

Learning points

- ▶ Gastroparesis is a poorly understood debilitating condition with serious biopsychosocial consequences with an unclear aetiology that can often be overlooked and misdiagnosed.
- ▶ Pharmacokinetics of medications can be unpredictable in patients with gastroparesis and failure to recognise this can lead to adverse effects with therapies such as opiates.
- ▶ Management of gastroparesis is symptomatic and failure to treat it can lead to potential life-threatening complications such as dehydration and malnutrition.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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