CASE REPORT

Successful management of chronic high-output ileostomy with high dose loperamide

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SUMMARY

High-stoma output is a common problem that can lead to dehydration and electrolyte disturbance. The following report describes three patients with end ileostomy who had high-stoma outputs where conventional medical management was unsuccessful in controlling stoma output. All three patients responded to high-dose loperamide, resulting in significant clinical improvement. High-dose loperamide therapy should be considered in patients with high-stoma output who have failed conventional medical management.

BACKGROUND

High-output ileostomies (>1.5 L/day) can be difficult to manage and frequently lead to dehydration, electrolyte imbalance and acute kidney injury. Current management guidelines for high-output stomas focus on supportive measures and medications that decrease bowel motility.¹ However, some patients fail to respond to these measures, leaving few treatment alternatives.

Loperamide has been shown to be an effective antimotility agent in reducing stoma output.² Anecdotal reports have suggested that loperamide in doses exceeding the maximum recommended dose may be beneficial for some patients in whom conventional strategies have been unsuccessful in controlling stoma output.

We report three cases of high-ileostomy output where conventional therapy with regular doses of loperamide was ineffective and therapy with high doses of loperamide was successful in reducing ileostomy output. In all cases, loperamide capsules were compounded for simpler administration of the high doses.

CASE PRESENTATION**Case 1**

A 72-year-old man with a history of ulcerative colitis was referred with problems of dehydration and weight loss due to high-stoma output (>2 L/day) on a background of chronic renal impairment. Twelve years earlier he had undergone a proctocolectomy and formation of J-pouch. Owing to chronic diarrhoea causing intolerable urgency and faecal incontinence, he underwent fashioning of end ileostomy 6 years later. In the 3 months prior to referral he had undergone two hospital admissions for dehydration with acute kidney injury secondary to a high-output ileostomy, which was managed with large doses of intravenous saline. At the time of review he had a stoma output of more

than 1.5 L/day despite taking loperamide 24 mg four times daily.

To reduce stoma output, his loperamide dose was further increased to 40 mg five times daily using compounded capsules.

The patient was reviewed 4 weeks later and had improvement in stoma output (reduced and thickened), hydration and renal function (creatinine remained stable).

On review a further 12 weeks later, stoma output had again increased and loperamide dose was further increased to 100 mg three times daily.

At the time of writing, 7 months following initiation of high-dose loperamide therapy, stoma output, weight and renal function remain stable. Liver function tests have also remained within normal range. The patient remains on loperamide 300 mg daily and denies any side effect from the high-dose loperamide, such as drowsiness or nausea.

Case 2

A 33-year-old woman presented with recurrent obstructions at the level of the ileostomy. Ten years earlier, she had undergone a total colectomy with ileorectal anastomosis and loop ileostomy for familial adenomatous polyposis. Three years prior to this presentation she required formation of loop ileostomy as treatment for small bowel perforation secondary to a small bowel loop stretched over a mesenteric desmoid tumour. Following stoma formation, she experienced recurrent obstructions at the level of the ileostomy and had the loop ileostomy converted to an end ileostomy.

Prior to this operation, she had experienced problems with chronic high-output ileostomy (>1.5 L/day), despite loperamide 16 mg/day; this became more pronounced after ileostomy revision.

Loperamide dose was increased to 30 mg three times per day using compounded capsules.

The patient was reviewed 8 weeks later and reported decrease in stoma output with having to empty the stoma bag less frequently, particularly following meals.

She continues to be reviewed regularly and is tolerating the high-dose loperamide with no side effects. Renal and liver function tests remain unremarkable, and given the positive effect on stoma output the patient continues to take loperamide 90 mg daily.

Case 3

A 66-year-old woman presented with high output jejunostomy following multiple and complex

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operations for small bowel obstruction, and recurrent enteroperineal fistula secondary to prior surgery for endometrial sarcoma. There had been extensive ileal resection and a distal jejunostomy had been constructed.

There was a background of chronic renal impairment. High-stoma output had become a serious health issue following her most recent laparotomy and ileojejunal resection; her previous dose of oral loperamide of 32 mg/day was no longer sufficient and high-stoma output led to episodes of acute on chronic renal failure. Further titration of loperamide ultimately using compounded capsules of 100 mg up to a daily dose of 300 mg (100 mg three times a day) was undertaken.

Following discharge, the patient required three times weekly intravenous normal saline infusion due to ongoing instability of renal function secondary to high-stoma output. Loperamide was further increased to 400 mg/day (100 mg four times a day) which was well tolerated by the patient; stoma output improved and normal saline infusions were successfully weaned.

The patient was reviewed 6 months later and reported stoma output remained stable.

On follow-up 2 years later, the patient has continued on loperamide 400 mg/day with no reported side effects. Stoma output has remained stable, although higher than usual due to her short length of small bowel, and as such the patient is reluctant to reduce the dose of loperamide. Aside from an elevated creatinine level due to pre-existing chronic renal impairment, other biochemical markers, liver function tests and blood glucose levels remain within normal range.

DISCUSSION

Daily faecal output of an ileostomy is usually less than 1 L, but higher outputs of greater than 2 L can occur leading to dehydration, hyponatraemia and hypomagnesaemia.³ 16% of patients with a small bowel stoma have problems with high stoma output (more than 2 L stomal output/day) in the first 3 weeks following surgery, and 27% of these need long-term treatment.⁴ High-output ileostomies are problematic, not only causing water and electrolyte disturbance but also the psychological and practical difficulties of managing a high-output stoma.³

All three patients reported had high-output stomas of more than 1.5 L/day despite restricting hypotonic/hypertonic fluids and consuming glucose-saline solutions in conjunction with regular dose loperamide. In the case of patient A and C, the high-stoma output led to recurrent episodes of dehydration, electrolyte disturbance and acute kidney injury.

Loperamide is frequently used in the management of high-output ileostomy for its effect in reducing intestinal motility. It is the preferred antidiarrhoeal drug due to it being neither sedating nor addictive, unlike other opioid receptor agonists such as codeine phosphate and diphenoxylate-atropine.⁵ For this reason, loperamide monotherapy was used for the treatment of high-output ileostomy in the cases reported.

In therapeutic trials involving loperamide, a dose of 16 mg/day has rarely been exceeded and is generally accepted as the conventional maximum dose.⁵ However, studies have observed that in some cases higher doses of loperamide, greater than 16 mg, are required to achieve an antidiarrhoeal effect.^{6–8} It has been suggested that this may be due to rapid transit of the drug through the small bowel limiting reuptake, with one study using doses of up to 24 mg of oral loperamide before observing an effect.⁸

A daily loperamide dose of 40 mg (20 mg two times a day) has also been described with the use of loperamide in suppository form.⁹ There are anecdotal reports of using higher doses of

oral loperamide empirically, particularly in cases where high stoma output has not responded to conventional loperamide doses. Guidelines for management of patients with a short bowel have further recommended that loperamide doses of 12–24 mg at a time may be required in patients where small bowel transit is very rapid.¹⁰ Loperamide is generally well tolerated with few side effects, although nausea, abdominal pain, dizziness and dry mouth have occasionally been reported.²

All three patients reported had ongoing high-stoma output despite conventional and higher than conventional loperamide dose. High-dose loperamide was achieved using compounded capsules due to ease of administration. Capsules appeared to be adequately absorbed in all three cases, with no patients observing non-absorbed capsules within the effluent. Stoma output reduced following higher doses of loperamide, and in the case of patient C, extremely high doses of 400 mg/day were well tolerated. No patients reported experiencing any side effects following the dose increase of loperamide.

Upward titration of loperamide, based on clinical assessment, to a dose that adequately controlled stoma output appeared to be effective in all three patients. While better control of stoma output was achieved, none of the patients have attempted a dose reduction of loperamide due to the ongoing positive clinical response they experience on their current dose. Renal and liver function was monitored throughout the duration of treatment, and remained at baseline level.

In cases where conventional management strategies and loperamide dosing has been unsuccessful, the titration of loperamide to higher doses appears to be effective and relatively safe in reducing stoma output. In all cases reported here, the patients demonstrated clinical improvement with no side effects using loperamide doses of up to 400 mg/day.

Learning points

- Appropriate management of high-stoma output is important in preventing complications such as dehydration, electrolyte disturbance and acute kidney injury.
- When conventional medical management of high-stoma output fails, higher doses of loperamide may achieve reduction in stoma output, particularly in cases where restoration of gastrointestinal continuity cannot be achieved.
- High-dose loperamide is generally well tolerated with few side effects, although nausea, abdominal pain, dizziness and dry mouth have occasionally been reported.

Contributors ML is the treating consultant for the patients in this case report. All authors contributed to writing up of this case report.

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