CASE REPORT

Ulcerative colitis associated with the herbal weight loss supplement Hydroxycut

Vernon Sivarajah, Quddus Abdul, Helen Pardoe, Peter Lunniss

Department of General Surgery, Homerton University Hospital NHS Foundation Trust, London, UK

Correspondence to

Vernon Sivarajah,
vernonsivarajah@nhs.net

SUMMARY

A 25-year-old Iranian gentleman was admitted to hospital with severe bloody diarrhoea and abdominal pain. He had similar episodes in the past. On each occasion his symptoms developed following the consumption of the herbal weight loss supplement Hydroxycut Hardcore X. On this admission, a (CT) scan demonstrated bowel wall thickening and peri-colonic fat stranding in the sigmoid colon. On flexible sigmoidoscopy, a continuous length of congested mucosa with multiple small ulcers was seen extending up to the mid-transverse colon, in keeping with ulcerative colitis. Histological analysis of biopsies was taken at the time and confirmed this. He was started on steroids early during his admission but this only provided a transient clinical improvement. The addition of cyclosporine, which was later changed to azathioprine, did not improve his condition either. He therefore underwent an open subtotal colectomy with end ileostomy. He made a slow but steady recovery and was discharged 3 weeks later.

BACKGROUND

Dieting supplements are often viewed as a quick, easy and safe way to lose weight and therefore remain very popular.¹ One such product range is Hydroxycut (Lovate Health Sciences Inc, Ontario, Canada). It has been reported to be one of the most popular 'fat burning' products available, with sales in excess of one million products per year.² In 2009, the American Food and Drug Administration (FDA) published a warning regarding these products primarily because of reports of liver damage.³ One patient required a liver transplant and another died. They have also been associated with seizures⁴ and rhabdomyolysis.⁵ Subsequently, 14 Hydroxycut products were recalled and the product line reformulated with different ingredients. We report a case of a patient developing ulcerative colitis following the use of a new Hydroxycut formulation called Hydroxycut Hardcore X (Lovate Health Sciences Inc). This is the first reported case.

CASE PRESENTATION

A 25-year-old Iranian gentleman was admitted to hospital with a 5-day history of bloody diarrhoea and generalised cramping abdominal pain. The diarrhoea consisted of up to 10 episodes of watery stool mixed with bright red blood and mucus. He did not report any nausea or vomiting, weight loss or fever. He believed that three weight loss tablets called Hydroxycut Hardcore X taken 12 h prior to the onset of his symptoms were responsible. He

described having a similar episode 5 months earlier after he had taken a course of Hydroxycut Hardcore X for a week. Following cessation of these tablets his symptoms lasted for approximately 5 days. The only other time that he had taken Hydroxycut Hardcore X was 2 years earlier. He had taken a 1–2 weeks course and subsequently developed abdominal pain and non-bloody diarrhoea. Again his symptoms resolved a week after tablet cessation. Interestingly, apart from these episodes he had remained asymptomatic and had not taken any more Hydroxycut Hardcore X. He had no other medical or surgical history of note. He was not taking any other medication and he had no family history of inflammatory bowel disease.

On initial physical examination he was afebrile and haemodynamically stable. His abdomen was diffusely very tender but he was not peritonitic. His bowel sounds and digital rectal examination were normal. Laboratory investigations at the time were also grossly normal. Of particular note he had a white cell count of $7.2 \times 10^9/l$, C reactive protein of 29 mg/l, haemoglobin of 12.9 g/dl, mean cell volume of 84.9 fl and albumin of 38 g/l.

Our initial impression was that he had developed colitis secondary to Hydroxycut Hardcore X. A conservative approach was therefore taken with the view that his symptoms would resolve with cessation of these tablets. In the meantime, tests were arranged to rule out an infective cause and inflammatory bowel disease.

INVESTIGATIONS

His abdominal pain worsened after a few days and he was thought to be peritonitic. He was still experiencing 10 episodes of bloody diarrhoea per day and he was now febrile and tachycardic. His inflammatory markers had increased. His white cell count was $11.2 \times 10^9/l$ and his C reactive protein was 203 mg/l. Concerned that this deterioration represented infective colitis and possible perforation he was started on antibiotics and a CT scan of his abdomen and pelvis was arranged (figure 1). This showed mild bowel wall thickening and mild peri-colonic fat stranding in the sigmoid and descending colon. There was no evidence of an ischaemic cause.

An infective cause was also becoming less likely with repeated stool analysis not revealing any evidence of *Salmonella*, *Shigella*, *Campylobacter*, *Escherichia coli*, *Clostridium difficile*, ova, cysts or parasites.

A flexible sigmoidoscopy revealed a continuous length of extensively congested and erythematous

To cite: Sivarajah V, Abdul Q, Pardoe H, et al. *BMJ Case Reports* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-007509

Figure 1 (CT) abdomen and pelvis (coronal section): Mild bowel wall thickening and mild peri-colonic fat stranding in the sigmoid and descending colon.

mucosa with multiple small ulcers extending up to the mid-transverse colon (figure 2), in keeping with ulcerative colitis. There was no evidence of diverticular disease. Biopsies were taken of the affected colon and histological analysis confirmed the diagnosis of ulcerative colitis.

TREATMENT

In view of these endoscopic features he was started on intravenous hydrocortisone, which was later converted to oral prednisolone. Despite an initial slow clinical and biochemical response to steroid therapy, he once again began to deteriorate after his second week of steroids. He was subsequently started on intravenous cyclosporine for a week, which was later changed to azathioprine for 4 days. Both failed to provide significant clinical or biochemical improvement so the decision was made to undertake an open sub-total colectomy with end ileostomy and mucous fistula formation.

Figure 2 Image of sigmoid colon during flexible sigmoidoscopy: Congested, erythematous and oedematous mucosa with exudates and small ulcers.

OUTCOME AND FOLLOW-UP

The procedure was performed without any complications. Histological analysis of the resected specimen revealed features of severe active chronic ulcerative colitis. He made a slow but steady recovery postoperatively and was discharged home after 3 weeks.

DISCUSSION

Ulcerative colitis is a chronic relapsing inflammatory condition of the colon. Its aetiology is unknown but it is thought that a genetic predisposition, environmental triggers, autoimmune phenomena or a combination of these may play a role. It is speculated that environmental factors are responsible for its relapsing nature; however this has not been proven.

This report described a case of ulcerative colitis developing following the use of a weight loss supplement called Hydroxycut Hardcore X. Although causation is difficult to prove, the temporal relationship between its use and all three symptomatic episodes raises the possibility that it precipitated these events. This is further supported by that fact that his symptoms improved and remained absent with cessation of these tablets. The failure of his symptoms to improve during the last episode despite stopping Hydroxycut Hardcore X may have been because on this occasion it triggered an irreversible sequence of events.

Hydroxycut Hardcore X is one of the newer herbal weight loss supplements marketed under the popular Hydroxycut brand name. It was formulated following the safety warnings and recall of 14 Hydroxycut products in 2009. The chemical components responsible for these effects are poorly understood.

Hydroxycut Hardcore X's key ingredients are caffeine, amino acids, *Capsicum annuum* and *coleus forskohlii*. The caffeine content is particularly high, especially when compared with other products. A single dose of Hydroxycut equates to almost three cups of coffee. Despite this, the manufacturer recommends taking it three times a day for optimal effect. Caffeine is a stimulant and is known to cause abdominal cramps and non-bloody diarrhoea in normal individuals. It may also trigger symptoms in patients with ulcerative colitis and therefore experts advise that it should be avoided.⁶ Early case-control studies failed to show any causal relationship between caffeine intake and ulcerative colitis.^{7 8} These studies however did not evaluate the effect of high caffeine intake specifically. Recently, dietary caffeine has been shown to increase disease activity in ulcerative colitis as assessed by the food sigmoidoscopy score.⁹

Other Hydroxycut Hardcore X ingredients include a range of amino acids and fatty acids. Generally, most of these are thought to play an important role in tissue repair and have not been associated with ulcerative colitis. The only exception to this is methionine, which is a sulphur containing amino acid that is converted to hydrogen sulphide by colonic bacteria. This is thought to disrupt mucosal integrity and lead to histological features consistent with ulcerative colitis.^{10 11} Its role in the development of ulcerative colitis in this patient is difficult to determine. This is because the amount of methionine in each tablet and the amount necessary to have a significant effect on bowel mucosa are unknown.

Of the remaining ingredients, *C. annuum* whose main chemical component is capsaicin has only been shown to increase post-inflammatory visceral sensitivity. These studies were performed on mice with induced colitis.¹² *Coleus forskohlii* is a herb, which in theory acts as a fat burner by increasing the body's basal metabolic rate and releases fatty acids from adipose

tissue but supporting clinical evidence has been limited.¹³ Neither of these ingredients or the remaining ones, which includes medium chain triglycerides, choline bitartrate, betaine hydrochloride and trans-ferulic acid, have been associated with the development of ulcerative colitis.

Learning points

- ▶ Non-prescription dieting supplements remain popular despite the absence of strong evidence of their effectiveness and safety. Hydroxycut is one of the leading products in this market.
- ▶ We describe for the first time ulcerative colitis developing following the use of a Hydroxycut product. Although causation is difficult to prove, we have identified a temporal relationship.
- ▶ Had the patient or the attending physician been aware or even suspicious of this association, it may have prevented a repeat episode, which culminated in a subtotal colectomy.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned, externally peer reviewed

REFERENCES

- 1 Pillitteri JL, Shiffman S, Rohay JM, *et al.* Use of dietary supplements for weight loss in the United States: results of a national survey. *Obesity* 2008;16:790–6.
- 2 Lobb A. Hepatotoxicity associated with weight-loss supplements: a case for better post marketing surveillance. *World J Gastroenterol* 2009;15:1786–7.
- 3 Rashid NN, Grant J. Hydroxycut hepatotoxicity. *Med J Aust* 2010;192:173–4.
- 4 Kockler DR, Wellein M. Seizure activity and unresponsiveness after hydroxycut injection. *Pharmacotherapy* 2001;21:647–51.
- 5 Dehoney S, Wellein M. Rhabdomyolysis associated with the nutritional supplement Hydroxycut. *Am J Health Syst Pharm* 2009;66:142–8.
- 6 Brown AC, Rampertab SD, Mullin GE. Existing dietary guidelines for Crohn's disease and ulcerative colitis. *Expert Rev Gastroenterol Hepatol* 2011;5:411–25.
- 7 Persson PG, Ahlborn A, Hellers G. Diet and inflammatory bowel disease: a case-control study. *Epidemiology* 1992;3:47–52.
- 8 Boyko EJ, Perera DR, Koepsell TD, *et al.* Coffee and alcohol use and the risk of ulcerative colitis. *Am J Gastroenterol* 1989;84:530–4.
- 9 Magee EA, Edmond LM, Tasker SM, *et al.* Associations between diet and disease activity in ulcerative colitis patients using a novel method of data analysis. *Nutr J* 2005;10:4–7.
- 10 Roediger WE. Decreased sulphur amino acid intake in ulcerative colitis. *Lancet* 1998;351:1555.
- 11 Pitcher MCL, Cummings JH. Hydrogen sulphide: a bacterial toxin in ulcerative colitis? *Gut* 1996;39:1–4.
- 12 Eijkelkamp N, Kavelaars A, Elsenburch S, *et al.* Increased visceral sensitivity to capsaicin after DSS-induced colitis in mice: spinal cord c-Fos expression and behaviour. *Am J Physiol Gastrointest Liver Physiol* 2007;293:G749–57.
- 13 Henderson S, Magu B, Rasmussen C, *et al.* Effects of *Coleus forskohlii* supplementation on body composition and hematological profiles in mildly overweight women. *J Int Soc Sports Nutr* 2005;2:54–62.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow