Vitamin D3 as a novel treatment for irritable bowel syndrome: single case leads to critical analysis of patient-centred data

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SUMMARY

Irritable bowel syndrome (IBS) is a chronic and debilitating functional disorder of the gastrointestinal tract with serious and detrimental impacts on quality of life. Its aetiology is largely unknown and the identification of effective management strategies remains far from complete. This paper first reports, a case of a 41-year-old woman IBS sufferer who reported significant symptom improvements with high-dose vitamin D3 supplementation. The sufferer identified a substantial body of patient data surrounding this potential therapy on social media sites, and this paper, therefore, also reports the findings from a systematic analysis of patient-centred, internet-based data surrounding this phenomenon. Data from 37 IBS sufferers commenting on the effect of vitamin D supplementation on their condition were located; approximately 70% of these reported that high-dose supplementation improved their IBS symptoms. A randomised controlled trial into the effect of vitamin D supplementation on IBS symptomatology to test this association scientifically is merited.

BACKGROUND

Irritable bowel syndrome (IBS) is a chronic, relapsing and debilitating functional disorder of the gastrointestinal tract. It represents the most commonly diagnosed gastrointestinal condition, with a UK prevalence of approximately 12% based on Rome II and III criteria.[1] Structural abnormalities seem to be absent. However, sufferers endure abdominal pain, bloating and altered bowel habits, resulting in significant reduction in quality of life.[2] The economic burden on society is also great.[3]

The aetiology of IBS remains largely undetermined. Factors proposed include visceral hypersensitivity, psychosocial factors, infection, inflammation and disturbances in central processing and the disorder is currently accepted as multifactorial.[2 4] This, coupled with the diversity of symptoms, makes management strategies diverse and inconclusive. Focus on the role of diet, including alternations in the intakes of lactose, non-starch polysaccharides and probiotics to improve symptoms, appears beneficial for some sufferers,[5] whereas pharmacological agents appear effective for others.[2]

An association between vitamin D and a variety of chronic conditions, for example, depression and inflammatory bowel disease, has received recent research interest.[6–9] Vitamin D3 has been registered as a potential therapy for IBS on the UK Database of Uncertainties about the Effects of Treatments.

CASE PRESENTATION

A 41-year-old woman with a 25-year history of severe, diarrhoea-predominant IBS reported significant improvement in symptoms, following initiation of high-dose vitamin D3 supplementation approximately 3 years ago. IBS diagnosis was first made in general practice approximately 20 years ago. This was confirmed sometime later by a consultant gastroenterologist, (using Rome II criteria), after negative coeliac screens and endoscopic investigations. The sufferer had tried an array of management regimes over the course of her illness. Drug treatments included antispasmodic therapies, selective serotonin reuptake inhibitors and antibacterial and antiprotozoal therapies including secnidazole, metronidazole, mebendazole, furazolidone and nitazoxanide, but these were largely reported to provide little or unsustained relief. A trial of the antinausea drug ondansetron appeared effective but was discontinued at the patient's request; she felt that this was only treating the symptoms and not providing a sustainable approach to the effective management of her condition. A lactose-free diet was commenced following a positive hydrogen breath test, and other dietary modifications were also tried, including gluten-free and low-fructose diets. These provided some relief but regular, >3 times weekly, flare-ups continued to occur. Alternative therapies including counselling, hypnotherapy and colonic irrigation were also undertaken, as well as trials of other supplementary therapies including caprylic acid, garlic oil, peppermint tea, aloe vera and probiotic drinks. Again, these provided the subject with minimal relief from her symptoms. The patient identified vitamin D3 as a potential therapy via social media. She reported a substantial quantity of patient data, surrounding the use of vitamin D3 as a management strategy for IBS, on internet-based patient blogs and forums.

TREATMENT

The patient takes 2000–4000 IU vitamin D3 daily as a softgel liquid capsule supplement (Solgar, taken as 2–4 capsules once daily). Dosage varies according to season, 2000 IU in summer and 3–4000 IU in winter.

OUTCOME AND FOLLOW-UP

Since commencing this supplementation regime, the subject experienced significant improvement in symptoms and now experiences near normal bowel habits. In 3 years of supplementation, relapses only occur if supplementation is ceased. Furthermore, the subject reports resolution of comorbid symptoms of depression and anxiety disorder.

DISCUSSION

Formal assessment of social media

Following the report by this sufferer of a substantial body of patient-centred literature on social media surrounding vitamin D3 as a potential management strategy for IBS, the authors conducted a systematic analysis of this data.

The 13 blog content management systems identified by Hookway[10] in addition to five blog search engines recommended by the sufferer herself, were first searched; these are displayed in table 1.

The search strategy employed is outlined in box 1. However, these search engines appeared to lack sensitivity and the yielded results contained no information relevant to this review. An internet search using Google was therefore subsequently undertaken. Here, the search terms employed consisted of 'IBS vitamin D', 'IBS vitamin-D management', 'IBS vitamin-D management blog', 'IBS vitamin-D management forum', 'IBS vitamin-D deficiency blog' and 'IBS vitamin-D deficiency forum'. On each occasion, 'IBS' was employed in the search, and 'irritable bowel syndrome' was also entered. Only blogs, forums, or weblog comments written by IBS sufferers themselves and surrounding a link between vitamin D and IBS were included. Owing to the vast amounts of information yielded by Google, the findings examined were limited to the first 50 results of each search. After this point, the exploration-exploitation reward curve tailed off.

This search located 12 different online sites (table 2), which were subsequently subjected to qualitative thematic analysis as outlined by Howitt and Cramer[11] to identify the major themes within the data. Two major themes emerged: (1) vitamin D is effective for the management of IBS symptoms and (2) IBS sufferers appear vitaminvitamin D deficient.

A total of 37 IBS sufferers reported their personal experiences with vitamin D3 supplementation. Of these, approximately 70% remarked that such supplementation benefitted their condition.[12–39] Although several bloggers did not allude to the exact dosage of supplementation taken, it is noteworthy that daily doses of vitamin D3 as high as 5000–10 000 IU appeared common. The following two quotations provide examples of the patient-reports located:

> I suffer from IBS-D and have been for about 4 years now… my doctor finally put me on 50,000IU once a week for about 6 months. In that time frame I got remarkably better. I actually started to have a life again. My symptoms went away almost completely (with small episodes three times a month as opposed to every single day more than (sic) once a day).[23]

Table 1 Table displaying blog content management systems and blog search engines searched during the primary search of internet-based literature

Blog content management systems	Blog search engines
Blogster	Technorati
Live Journal	Social Mentions
Xanga	Ice Rocket
Typepad	Topsy
Dairyland	Official Google Blog
Blogit	
Blogharbour	
Squarespace	
Blurty	
Blogger	
Opendiary	
Journalspace	
Whitepage	

> I… have had IBS-D for about 20 years… in August 2009… I began taking 3000 IU of Vitamin D… surely but slowly, I stopped having the crazy urgency to go, and began to have normal bowel movements… I then began taking 5000 IU of vitamin D a day... and since then (it's now 2 Oct)... I feel I have turned the tide on IBS… from going many times a day, staying at home from work… now I go… one, and maybe 2 a day… Do I think Vitamin D has helped, absolutely... because I've been taking everything else for years[16]

Support for the IBS-mediating potential of vitamin D is further provided by two bloggers describing how their IBS symptoms returned upon cessation of supplementation.[23 40] These comments provide clear evidence that the symptom improvements were a result of vitamin D supplementation.

As Amanda1988[23] explains:

> When my prescription ran out my doctor told me to take over the counter vitamins once a day again… The longer I was off the high dose vitamin D the sicker (sic) I got… the day after I started the high dose vit D, I felt better quickly.

The second major theme to emerge from the data was that sufferers were vitamin D deficient. Twenty-seven sufferers, located in this search, commented on their serum 25(OH)D concentrations prior to supplementation initiation, of whom over 90% report having been diagnosed with low or deficient serum concentrations.[13 15 19 20 23 27 31 32 34 37 38 40–52]

Of those individuals explicitly reporting such values, severe deficiencies comprised the nature of suffering. Concentrations of 'less than 7',[20] '15' [44] and '18.5' [41] were all reported. The units of measurement were not provided, but the presence of a deficiency remains whichever unit was inferred. However, whether such a deficiency is unique to IBS sufferers remains to be determined and the nature of the temporal association of this potential relationship also remains to be deduced. It is also possible, for example, that those who are vitamin D deficient are more likely to be responsive to supplementation. However, less than 50% of supplement users alluded to their 25(OH)D status and any such pattern could thus not be illuminated from the patient reports located.

DISCUSSION

A small body of research at the molecular level may exist to add biological plausibility to these patient reports. In line with a proposed autoimmune origin of IBS, vitamin D is thought essential for optimal immunoregulation,[53 54] whereas 25(OH)D has also recently been implicated in the homeostasis of the intestinal mucosal barrier; deficiency is thought to lead to mucosal damage.[55] These findings must be interpreted cautiously, however, given the still unconfirmed aetiology of IBS, and further research is required before any such potential mechanistic associations can be established.

It is also important to note, however, that 12 sufferers reported high-dose vitamin D supplementation to result in no

Box 1

Table displaying keywords searched during the review of blog search engine data (Irritable bowel syndrome OR ibs) and (vitamin D OR 1,25-dihydroxyvitamin D OR 25-hydroxyvitamin D OR cholecalciferol OR ergocalciferol OR D3 OR D2 OR micronutrients OR vitamin supplementation OR nutrient OR nutritional).

Table 2 Table displaying 12 blog sites and forum threads (with URLs) yielded from Google search of anecdotal literature

Blogs	Forums
IBS Tales	Irritable Bowel Syndrome Self Help and Support Group
http://www.ibstales.com/blog/vitamin-d/	http://www.ibsgroup.org/forums/topic/111439-how-i-fixedovercomeresolved-my-ibs-d/
	http://www.ibsgroup.org/forums/topic/107118-what-i-did-to-cure-my-ibs-d/
	http://www.ibsgroup.org/forums/topic/132743-vitamin-d-has-helped-me-a-lot/
	http://www.ibsgroup.org/forums/topic/116348-so-i-found-out-that-my-vitamin-d-was-mega-lowwhat-now/
	http://www.ibsgroup.org/forums/topic/128453-vit-d/
	http://www.ibsgroup.org/forums/topic/133686-calcium-vitamin-d-and-cranberry-sauce/
Digestion blog	HealthBoards
http://www.digestionblog.com/vitamin-d-and-irritable-bowel-syndrome-ibs/#comments	http://www.healthboards.com/boards/irritable-bowel-syndrome-ibs/824836-vitamin-d-helped-my-ibs-read-please.html
	HealingWell.com
	http://www.healingwell.com/community/default.aspx?f=26&m=1213901
	PsychCentral
	http://forums.psychcentral.com/showthread.php?t=142683
	WebMD
	http://forums.webmd.com/3/digestive-disorders-exchange/forum/1700/8

change [38 46 56–61] or moreover, a worsening [50 62–65] of their IBS symptoms. As one sufferer comments:

> Personally I have tried and continue to take lots of Vitamin D3… but without much success[56]

Thus, despite the potential of Vitamin D as a therapy for IBS, benefits are not universal to sufferers and may reflect the divergent nature of subtypologies of the condition. A lack of detail reported by all sufferers, for example, on dose, source, subtype and severity, located in this search has meant that any potentially important differences between sufferers for whom supplementation was effective, and those for whom supplementation appeared detrimental or resulted in no change, could not be determined. It is possible, for example, that certain subtypes of IBS may be more responsive to supplementation than others, but subtype-specific information is largely absent. The true nature of any such associations could be determined only under controlled experimental settings.

In summary, therefore, this review of patient-centred data on social media has identified a potential relationship between high-dose vitamin D supplementation and IBS symptomatology. The data justify an exploratory randomised controlled trial to test scientifically the association between these two variables. A secondary outcome of this report is the indication of the more generalised potential of patient-led resources as information repositories for case-report-like evidence.

Learning points

- High-dose vitamin D3 supplementation may be beneficial in the management of irritable bowel syndrome (IBS). There is now a case for an exploratory controlled trial to test this hypothesis scientifically.
- It may be beneficial to test serum 25(OH)D concentrations in patients presenting with IBS.
- Social-media based literature may provide medical research with an innovative form of patient data, representing the first line of evidence in the elucidation of new medical phenomena or plausible hypotheses.

Competing interests None.

Patient consent Obtained.

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