

Review article: gut-directed hypnotherapy in the management of irritable bowel syndrome and inflammatory bowel disease

S. L. Peters, J. G. Muir & P. R. Gibson

Department of Gastroenterology,
Central Clinical School, The Alfred
Hospital, Monash University,
Melbourne, Vic., Australia.

Correspondence to:

Dr S. L. Peters, Department of
Gastroenterology, Central Clinical
School, The Alfred Hospital, Monash
University, Melbourne, Vic. 3004,
Australia.
E-mail: simone.peters@monash.edu

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SUMMARY

Background

Gut-directed hypnotherapy is being increasingly applied to patients with irritable bowel syndrome (IBS) and to a lesser extent, inflammatory bowel disease (IBD).

Aim

To review the technique, mechanisms of action and evidence for efficacy, and to identify gaps in the understanding of gut-directed hypnotherapy as a treatment for IBS and IBD.

Methods

A review of published literature and a systematic review of clinical trials in its application to patients with IBS and IBD were performed.

Results

Gut-directed hypnotherapy is a clearly described technique. Its potential mechanisms of action on the brain-gut axis are multiple with evidence spanning psychological effects through to physiological gastrointestinal modifications. Six of seven randomised IBS studies reported a significant reduction (all $P < 0.05$) in overall gastrointestinal symptoms following treatment usually compared to supportive therapy only. Response rates amongst those who received gut-directed hypnotherapy ranged between 24% and 73%. Efficacy was maintained long-term in four of five studies. A therapeutic effect was also observed in the maintenance of clinical remission in patients with ulcerative colitis. Uncontrolled trials supported the efficacy and durability of gut-directed hypnotherapy in IBS. Gaps in understanding included to whom and when it should be applied, the paucity of adequately trained hypnotherapists, and the difficulties in designing well controlled-trials.

Conclusions

Gut-directed hypnotherapy has durable efficacy in patients with IBS and possibly ulcerative colitis. Whether it sits in the therapeutic arsenal as a primary and/or adjunctive therapy cannot be ascertained on the current evidence base. Further research into efficacy, mechanisms of action and predictors of response is required.

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INTRODUCTION

Irritable bowel syndrome (IBS) is the most common functional disorder affecting the small and large intestine and is estimated to affect approximately 5–12% of the population in Western countries.^{1, 2} The condition is characterised by recurrent episodes of abdominal pain, bloating and altered bowel habits in the absence of any pathological abnormality.³ Despite this, the exact aetiology of IBS is unknown. Possible abnormalities are likely multifaceted and comprise issues with visceral sensitivity, intestinal motility, bacterial populations and symptom perception.⁴ Patients with IBS may have irregularities with one or a combination of these interconnected functions.⁴

There is no known cure for IBS and treatment is limited to symptom management strategies. Three common approaches to control symptoms associated with IBS include pharmacological agents, dietary therapies and psychological treatments. Despite the evidence of efficacy for all these treatments, IBS continues to be associated with an increased use of health care resources where the condition accounts for up to 10% of consultations to general practitioners and up to 50% of referrals to gastroenterologists.⁵ IBS, therefore, has a large economic impact through high health care costs and indirectly through loss of productivity and absenteeism.⁶

In contrast to the functional nature of IBS, various inflammatory conditions are also known to affect the gastrointestinal tract. One of the most common of these is inflammatory bowel disease (IBD), principally comprising ulcerative colitis and Crohn's disease. Like IBS, the exact aetiology of IBD is unknown, but, a combination of genetic, environmental and immunological factors are thought to play a role in disease development.⁷ The ways in which IBD affects an individual is highly variable but common symptoms tend to include abdominal pain, diarrhoea, faecal urgency, fever, loss of appetite and weight loss. Management of IBD mainly involves the use of pharmacological agents, dietary and psychological therapies being less commonly applied. A frequent challenge in the care of patients with IBD is differentiating gastrointestinal symptoms due to IBD from those caused by IBS. Symptoms of IBS are known to be more common in patients with IBD compared with healthy controls.^{8–11} However, given that IBS is a common disorder, whether this overlap is due to the co-existence of both conditions remains uncertain.⁸ What is clear is that IBD patients will often report symptoms referable to the gastrointestinal tract, without objective evidence of

ongoing disease activity,⁸ resulting in significant impairment in quality of life, anxiety, depression, as well as unhealthy coping strategies and increased use of health care resources.^{10–13} Furthermore, it can lead to the increased use of anti-inflammatory medications, with their potential side effects. As a result, management strategies for IBD patients with symptoms suggestive of IBS are required.¹⁴

Providing effective treatment strategies for IBS and IBD (either through the co-existence of IBS or otherwise) are necessary. While drugs are used commonly in IBS and IBD populations, there is evidence to suggest that nonpharmacological approaches may also contribute to improved outcomes. The most extensively explored psychological treatments include cognitive behavioural therapy (CBT), biofeedback and gut-directed hypnotherapy. In this review, current knowledge of gut-directed hypnotherapy as a treatment option for IBS and IBD is outlined and gaps in knowledge and its application discussed.

Brain-gut axis

The brain-gut axis refers to the bi-directional flow of information that takes place between the brain and the gastrointestinal tract. The organisation of homeostatic reflexes within the brain-gut axis allows afferent signals arising from the lumen of the gut to be transmitted via various visceral afferent pathways to the central nervous system (CNS).¹⁵ Reflexes that generate appropriate gut responses to physiological as well as pathological afferent gut signals occur at the level of the enteric nervous system (ENS), the spinal cord and the pontomedullary nuclei and limbic regions.¹⁵ Through such reflexes, vagal visceral afferent inputs play an important role in such diverse functions as modulation of emotion, pain, satiety and immune responses.¹⁵

While reflex circuits within the ENS, in principle, can regulate and synchronise all basic gastrointestinal functions (motility, secretion and blood flow), coordination of gut functions with the overall homeostatic state of the organism requires continuous and close communication between the CNS and the gastrointestinal tract.¹⁵ Descending corticolimbic influences can set the gain and responsiveness of these reflexes, impose distinct patterns of motor responses on lower circuits and modulate visceral pain transmission.¹⁵ Such descending modulation can be triggered by cognitive or emotional influences, or in response to environmental demands, and can override local reflex function during sleep, in the context of

environmental stressors, or during strong emotions such as fear and anger.¹⁵

The brain-gut axis, therefore, plays an important role in the regulation of many vital functions including the regulation of digestive processes, in the modulation of the gut-associated immune system, and in the coordination of the overall physical and emotional state of the organism with activity in the gastrointestinal tract.¹⁵ As such, peripheral and central alterations in brain-gut interactions are likely to underlie the pathogenesis of symptoms in all patients with chronic intestinal disorders.

No single pathophysiological mechanism can explain all symptoms across all patients with chronic intestinal disorders. It is likely that different patterns of dysregulation in the interactions between the CNS and the respective abdominal end organ are involved in different subsets of patients. While dysregulation at first onset of symptoms may be purely functional and driven primarily by abnormal autonomic system activity, chronicity of symptoms may be associated with neuroplastic and structural changes in the brain, spinal cord and gastrointestinal tract.¹⁵

Despite the lack of scientific data, one may speculate that there are different ways chronic intestinal disorders can develop from dysregulation within the brain-gut axis. Long-standing transient dysregulation of homeostatic reflexes (in the periphery and/or centrally) may gradually result in neuroplastic peripheral and/or central changes, leading to permanent dysregulation.¹⁵ Alternatively, formation of maladaptive interoceptive memories may create central mechanisms by which pain and discomfort can be experienced in contexts of emotional distress, without any abnormal peripheral responses.¹⁵ Recent work by Koloski and colleagues has provided support for both the brain-gut and gut-brain hypothesis in IBS patients specifically.¹⁶ In a cohort of subjects without IBS at baseline, higher levels of anxiety at baseline, were a significant predictor of developing IBS 12 years later.¹⁶ Further, IBS at baseline, without elevated levels of anxiety and depression at baseline, had significantly higher levels of subsequent anxiety and depression at follow-up.¹⁶ These findings were interpreted as showing that the CNS and gastrointestinal tract are likely to interact bi-directionally in IBS.¹⁶

Several general modulators within the brain-gut axis have been proposed to alter brain-gut interactions in chronic intestinal disorders. These include centrally targeted pharmacological and nonpharmacological therapies. Multiple sites can be targeted within the brain-gut axis,

and these include matostatin, opioid, 5-hydroxy tryptamine-3 (5-HT₃) and neurokinin receptors and corticotrophin releasing factor-1 (CRF₁)¹⁵, and can influence symptoms involving gastrointestinal function and emotion.¹⁵ There is also limited evidence to suggest that modulating the intestinal flora with nonabsorbed antibiotics or prebiotics may have beneficial effects on some chronic intestinal symptoms.¹⁵ Regarding nonpharmacological therapies, several psychological treatments have been shown to be effective in improving gastrointestinal symptoms and psychological state amongst various chronic intestinal disorders in numerous high-quality clinical trials.

Psychological treatments

Hypnotherapy and CBT are the most extensively studied psychological treatments within IBS and IBD populations. Other promising treatments include psycho-education, acceptance and commitment therapy and various forms of biofeedback. The application of hypnosis for the treatment of IBS was first described by Whorwell and colleagues at the University Hospital of South Manchester in the 1980s and is known commonly today as 'gut-directed hypnotherapy'.¹⁷ While initially used for IBS, gut-directed hypnotherapy has recently been applied to patients with IBD.

Hypnotherapy

The therapeutic technique. Hypnotherapy refers to the use of hypnosis as a therapeutic technique. Typically, hypnosis involves an introduction where suggestions for imaginative experiences are presented. A hypnotic induction will then follow, with the aim of allowing the subject to enter an altered consciousness or trance state. Once in the trance state, suggestions for changes in subjective experience, alterations in perception, sensation, emotion, thought or behaviour are presented. In gut-directed, as opposed to standard hypnotherapy, suggestions are made for the control and normalisation of gastrointestinal function (normally on a repetitive basis) and metaphors are used for bringing about improvement, as outlined in Table 1. This differs from other forms of psychological treatment where therapy is provided to patients in a conscious state.

Efficacy of gut-directed hypnotherapy in IBS and IBD
Search strategy and study selection. A search of the medical literature was conducted to identify publications describing the clinical evaluation of gut-directed hypnotherapy in patients with IBS or IBD using MEDLINE,

Table 1 | Common gut-directed suggestions and metaphors used during hypnosis

Suggestions	
Improvement in pain & bloating	"There will be no more pain, no more bloating and no more discomfort"
Improvement in bowel habits	"Your bowel habits will continue to improve day by day, week by week and month by month"
Improvement over time	"You will continue to get better and better and better"
Metaphors	
River	The flow of the river is a representation of the flow of the gastrointestinal tract. Patients control the flow of their river according to their needs.
Hand warmth	The warmth of the hands represents calmness and control. Patients visualise feelings of calmness and control over their gastrointestinal tract while placing their hands on their abdomen.
Medicine	Taking medicine improves gastrointestinal function. Patients envisage the medicine providing protection against pain, bloating, discomfort and abnormal bowel habits.

EMBASE, PubMed, PsychINFO and AMED (Allied and Complementary Medicine Database). Search terms included functional gastrointestinal disease, irritable bowel syndrome, inflammatory bowel disease, Crohn's disease, ulcerative colitis, hypnotherapy and gut-directed hypnotherapy. Due to the difficulty in performing randomised clinical trials using psychological techniques, both randomised and uncontrolled trials assessing the assessing clinical outcomes of gut-directed hypnotherapy for the treatment of IBS or IBD were included for review.

Randomised control trials. Several randomised clinical trials have been adopted amongst the IBS population, but only one has been undertaken within an IBD cohort. A summary of these studies is provided in Table 2. The majority of these have been recently subjected to systematic review and meta-analysis.¹⁸ Detailed analysis of the gastrointestinal outcomes from those RCTs is shown in Table 3 and psychological outcomes in Table 4.

The first RCT conducted to assess the change in gastrointestinal symptoms, following a course of individualised gut-directed hypnotherapy in unselected patients with IBS refractory to standard medical treatment, was reported by Whorwell *et al.*,¹⁹ where greater improvements in individual symptoms of abdominal pain, distension and bowel habit (all $P < 0.0001$) were observed in the gut-

directed hypnotherapy group ($n = 15$) compared to the psychotherapy control ($n = 15$). The magnitude of the effect was large; for example, abdominal pain changed from a mean weekly score 14 (maximum score 21) to 12 in the placebo group and 2 in the hypnotherapy group. Similar observations of improvement have been further substantiated by more recent work within the literature.^{20–23} All described overall gastrointestinal symptom improvement, ranging between 24% and 73%, following gut-directed hypnotherapy compared to control interventions (Table 3). Improvement was observed regardless of whether participant populations were unresponsive to standard medical treatment^{22, 23} at enrolment or not.^{20, 21} Individual symptomatic responses differed between studies and can be seen in Table 3.

A positive effect has also been shown in group, as opposed to individualised, gut-directed hypnotherapy, where overall greater improvement in IBS-IS scores were observed in 28 (61%) out of 46 GDH patients compared to 18 (41%) of 44 of those allocated to the active control (absolute difference 20%, 95% CI: 0–40%, $P = 0.046$).²⁴ Long-term maintenance of symptomatic improvement was observed in four of the five above-mentioned individualised studies^{20–24} and ranged from 2 months to 1 year. Superior improvement in one or more psychological domain (e.g. anxiety, depression and well-being) was also seen following gut-directed hypnotherapy compared to control conditions in several studies.^{19, 20, 22, 24}

Not all studies have reported significant improvements with gut-directed hypnotherapy compared to control interventions. In a paper that reported the results of two separate RCTs, with similar design features, a greater reduction in gastrointestinal symptoms following hypnotherapy (compared to control) was only observed in one of the two included studies.²² In this paper, 138 patients were randomised to study 1 ($n = 90$) or study 2. In both studies, IBS-related symptoms were improved post-treatment in the gut-directed hypnotherapy groups ($P < 0.05$), but not in the control groups. As described, in study 1, a significantly greater improvement could be detected in the gut-directed hypnotherapy group compared to the control group (mean difference 3.7, 95% CI: 0.3–7.2, $P = 0.03$), but this was not observed in study 2 (mean difference 0.3, 95% CI: –0.2–0.9, $P = 0.22$). This may have partly related to the lack of power in the latter study where only 48 participants were enrolled.

One RCT targeted mechanistic changes in patients with IBS as its primary outcome measure.²⁵ Gut-directed

Table 2 | Characteristics of the study population, methodology for hypnotherapy and control population used in randomised controlled trials of gut-directed hypnotherapy in patients with irritable bowel syndrome (IBS) and inflammatory bowel disease

Study	Studied population		Interventions				
	Number (male)	Disease	Gut-directed hypnotherapy				Control
			Number of sessions	Duration of sessions	Duration of therapy	Audiotape provided	
Whorwell ¹⁹	30 (4)	IBS	7	30 min	12 weeks	Yes	Psychotherapy
Galovski ²⁰	13 (2)	IBS	12	30–60 min	12 weeks	Yes	Symptom monitoring (wait-list)
Palsson ²¹	24 (9)	IBS	7	45 min	12 weeks	Yes	Delayed therapy (wait-list)
Simren ²⁵	28 (9)	IBS	12	60 min	12 weeks	No	Supportive therapy
Roberts ²³	81 (12)	IBS	5	30 min	5 weeks	Yes	Usual medical care
Lindfors ²²	90 (19)	IBS	12	60 min	12 weeks	No	Supportive therapy
Lindfors ²²	48 (9)	IBS	12	60 min	12 weeks	Yes	Wait-list control
Moser ²⁴	90 (19)	IBS	10	45 min	12 weeks	Yes	Supportive talks with medical treatment
Keefer ²⁶	48 (9)	Ulcerative colitis	12	60 min	12 weeks	Yes	Attention control

hypnotherapy reduced the sensory and motor components of the gastro-colonic response compared with supportive therapy only when evaluated by colonic distention before and after a 1-h duodenal lipid infusion. The results paralleled the reported clinical improvement in 10 of 14 patients following hypnotherapy compared to 5 of 14 in the control group, although the clinical differences did not reach statistical significance ($P = 0.06$). Despite this, the greatest understanding of mechanistic changes following a course of gut-directed hypnotherapy can be obtained from observational studies, and are explained in detail below.

Within the IBD population, gut-directed hypnotherapy has also demonstrated a therapeutic effect, clinical remission being prolonged in 26 patients with quiescent ulcerative colitis by a mean of 78 days compared to 29 attention controls.²⁶ Furthermore, analysis comparing the groups on the proportion of patients maintaining remission at 1 year was significantly greater with hypnotherapy (68%) compared to control (40%) patients ($P = 0.04$). While the mechanisms by which hypnotherapy might prolong remission are speculative at this point, stress management and increased self-efficacy (the belief in one's ability to succeed) are two possible explanations.²⁷ As 75% of patients with IBD identify stress as a trigger of relapse,²⁸ behavioural interventions that address stress and improve coping could prolong remission.²⁷ Additional work is needed amongst this entity to further substantiate these results.

Thus, the majority of the published trials in IBS and the only trial in IBD provide evidence to suggest that

gut-directed hypnotherapy is efficacious, with the main measure effect being a reduction in gastrointestinal symptom scores. Six of seven (86%) IBS studies indicated a significant reduction in global gastrointestinal symptoms following gut-directed hypnotherapy compared to those in the control group. The observed improvement occurred irrespective of patient responsiveness to standard medical treatment, the bowel habit of the patients and regardless of whether the therapy was provided individually or in group settings. This improvement was maintained long-term in four of five studies.

Uncontrolled studies. While several other studies have further explored the use of hypnosis in IBS, these were non-randomised observational studies,^{29–42} single case reports^{43–45} or comparison of two types of hypnotherapy for IBS.^{21,46–48} They have uniformly suggested that gut-directed hypnotherapy maybe useful in controlling gut symptoms. The most impressive was an audit of 1000 consecutive patients in which 76% had a 50-point reduction in the IBS Symptom Severity Score after 12 sessions of hypnotherapy over 3 months.⁴² Other studies have not included gastrointestinal symptoms as a primary or secondary outcome but have focused more specifically on possible mechanistic changes following a course of gut-directed hypnotherapy^{49, 50} or likely predictors of response to hypnosis.^{51, 52}

Long-term follow-up studies have mostly been observational, other than the study recently published by Moser *et al.*, and have too reported sustained beneficial effects of gut-directed hypnotherapy for the treatment of

Table 3 | Gastrointestinal symptom outcomes of randomised controlled trials using gut-directed hypnotherapy (GDH) in patients with irritable bowel syndrome (IBS) and inflammatory bowel disease

Study	Outcomes	Outcome scoring method	% of responders	Results		NNT
				At completion of therapy (GDH compared to control)	At follow-up	
Whorwell ¹⁹	Pain; distension; bowel habit	Likert scale	N/A	Greater individual improvement in abdominal pain, distention and bowel habit (all $P < 0.0001$)	Not assessed	N/A
Galovski ²⁰	Diarrhoea; constipation; pain; bloating; flatulence; belching; nausea	Composite Primary Reduction Score (CPRS); Symptom diary	GDH 73% Control 0%	Greater overall improvement (mean difference 0.84, $P = 0.016$). Greater individual improvement in constipation ($P = 0.015$), abdominal pain ($p = .012$) and flatulence ($P = 0.006$) but not diarrhoea, bloating, belching or nausea	Improvement maintained in 44% 2-months post-treatment	N/A
Palsson ²¹	Overall GI symptom improvement; pain; bloating; proportion of hard/loose bowel movements; frequency bowel movements	Symptom diary	N/A	Greater overall improvement ($P = 0.002$). Greater individual improvement in pain (mean difference -3.9 , $P = 0.049$) and proportion of hard/loose stools (mean difference -0.16 , $P = 0.003$) but not bloating or frequency of bowel movements	Improvement maintained 10-months post-treatment. 68% mean estimated degree of change	N/A
Simren ²⁵	Colonic sensory thresholds; tonic and phasic motor activity	Barostat procedure	GDH 71% Control 36%	Colonic sensitivity following duodenal lipids reduced post-GDH for pain (33 ± 2.7 mmHg vs. 26 ± 3.3 mmHg, $P < 0.01$) and following the control intervention for gas (22 ± 1.7 mm Hg vs. 16 ± 1.6 mm Hg, $P < 0.01$), discomfort (29 ± 2.9 mm Hg vs. 22 ± 2.6 mm Hg, $P < 0.01$) and pain (33 ± 2.7 mmHg vs. 26 ± 3.3 mmHg, $P < 0.01$). Reduced balloon volumes during lipid infusion were seen in the control intervention (141 ± 15 mL vs. 111 ± 19 mL, $P < 0.05$) but not after GDH (83 ± 14 mL vs. 80 ± 16 mL, $P > 0.20$)	Not assessed	3
Roberts ²³	Overall GI symptom improvement; pain; constipation; diarrhoea	Symptom score based on Rome II criteria	N/A	Greater overall improvement (mean difference 8.5, 95% CI: 2.3–14.7, $P = 0.008$). Greater individual improvement in pain (mean difference 12.5, 95% CI: 2.4–22.6, $P = 0.02$) and diarrhoea (mean difference 7.6, 95% CI: 0.2–15.1, $P = 0.046$) but not constipation	Improvement maintained 1-year post-treatment but mean change in GDH was not significantly superior	N/A
Lindfors ²²	Bloating; gas; pain; loose stools; urgency; hard stools; incomplete evacuation	Scores of individual symptoms were combined into two domains (i) sensory symptom score (pain, bloating, gas) (ii) bowel habit score (loose stools, urgency, hard stools, incomplete evacuation)	GDH 38% Control 11%	Greater overall improvement (mean difference 3.7, 95% CI: 0.3–7.2, $P = 0.03$) and sensory symptom score (mean difference 2.2, 95% CI: .5–3.1, $P = 0.01$) but not bowel habit score	Improvement maintained in 42% 1-year post-treatment	4
Lindfors ²²	Pain, bloating, constipation, diarrhoea, satiety	Gastrointestinal Symptom Rating Scale IBS version (GSRS-IBS)	GDH 24% Control 11%	No overall greater improvement. Greater individual improvement in bloating (mean difference 0.82, 95% CI: .30–1.3, $P = 0.003$). Independent analyses revealed overall greater improvement following GDH ($P < 0.05$) but no improvement was seen in the control group	Improvement maintained in 28% 1-year post-treatment	9
Moser ²⁴	Overall GI symptom improvement	IBS Impact Scale (IBS-IS)	GDH 61% Control 41%	Overall greater improvement (absolute difference 20%, 95% CI: 0–40.2%, $P = 0.046$)	Improvement maintained in 54% of GDH patients and 25% of the controls 1-year post-treatment	5

Table 3 | (Continued)

Study	Outcomes	Outcome scoring method	% of responders	Results		NNT
				At completion of therapy (GHD compared to control)	At follow-up	
Keefer ²⁶	Occurrence of disease flare	Relapse = Daily rectal bleeding for the past 7 days, a Mayo score >2 or any subscale score >1		Clinical remission prolonged by 78 days	Improvement maintained in 68% 1-year post-treatment	3

NNT, number needed to treat; GI, gastrointestinal.

IBS over time.^{33, 53} For example, Gonsalkorale *et al.* explored the long-term follow-up of 204 patients and demonstrated that approximately four of every five patients who responded to treatment fully retained their therapeutic benefits for a minimum of 1 year (outcome assessed for up to 5 years after treatment) and that most continued to see further improvements in bowel symptoms after the end of the treatment course.³³

Mechanism of action

The precise mechanisms by which gut-directed hypnotherapy exerts an efficacious effect are poorly understood. Regardless, there is a strong evidence that gut-directed hypnotherapy can influence psychological and physiological outcomes, including motility, visceral sensitivity, immune function and central processing.

Psychological factors. A correlation between perceived gastrointestinal symptom severity and the severity of psychological symptoms has been described in patients with IBS.⁵⁴ As such, one possible mechanism underlying the effectiveness of gut-directed hypnosis might be through the improvement of psychological symptoms.⁵⁴ This inference is supported in some^{21, 29} but not all^{31, 36} studies. In fact, some work has shown discordance between effects of gastrointestinal symptoms and improvement in either anxiety or depression.³⁶ It may be a combination of both psychological and physiological factors that together enhance gastrointestinal symptom improvement amongst this cohort.

Physiological factors. Gut-directed hypnotherapy has an effect on various physiological indices:

- **Gut motility:** In patients with IBS, gut-directed hypnotherapy reduced fasting distal colonic motility.⁵⁰
- **Visceral sensitivity:** The effect of gut-directed hypnotherapy on rectal sensitivity has been addressed with differing results. Initial work revealed improved rectal

sensitivity amongst patients with diarrhoea-predominant IBS,³⁸ an effect that was later confirmed within all IBS subtypes.^{36, 55} In contrast, other work has failed to observe this effect.^{21, 49} The apparent inconsistency in results may be due to differences in methodology or whether adult^{21, 36, 38, 55} or paediatric⁴⁹ populations were studied.

- **Immunological effects:** Self-hypnotherapy has been shown to antagonise decreases in natural killer (NK) T-cell counts induced by the stress of examinations. Furthermore, changes in CD3⁺, CD4⁺ and CD8⁺ lymphocyte counts before exams were also reduced by self-hypnosis.^{56, 57} More recently, one session of gut-directed hypnotherapy in 17 patients with active ulcerative colitis reduced systemic and rectal mucosal inflammatory responses. Specifically, it reduced serum interleukin-6 concentration by 53%, circulating NK cell numbers by 18%, and rectal mucosal release of substance P by 81%, histamine by 35% and IL-13 by 53%.⁵⁸
- **Effects on central processing:** Functional magnetic resonance imaging (fMRI) provides insights into cortical activation patterns to painful rectal stimuli, where patterns differed in patients with IBS compared to controls.⁵⁹ Using this technique, gut-directed hypnotherapy has a normalising effect on the aberrant central processing of visceral signals in patients with IBS.⁶⁰
- **Effects on autonomic nervous system activity:** Autonomic nervous system abnormalities are well documented to occur in patients with IBS. Gut-directed hypnotherapy has been reported to reduce heart and respiratory rates independently of hypnotically induced emotions.⁶¹

Practical considerations and unanswered questions

There are several issues and questions that remain either unanswered or troublesome in progressing the more

Table 4 | Psychological symptom outcomes of randomised controlled trials using gut-directed hypnotherapy in patients with irritable bowel syndrome (IBS)

Study	Outcomes	Outcome scoring method	Results	
			Initial (post-treatment)	Delayed (follow-up)
Whorwell ¹⁹	Well-being	Likert scale	Overall greater improvement in well-being ($P < 0.0001$) in the GDH compared to control intervention	Not assessed
Galovski ²⁰	Depression; anxiety	Beck Depression Inventory; State-Trait Anxiety Inventory	Overall greater reduction in state ($P = 0.04$) and trait ($P = 0.014$) anxiety but not depression pre- vs post-treatment. Comparisons not made between interventions	Reduced state and trait anxiety maintained 2-months post-treatment
Palsson ²¹	Psychopathology; somatisation; autonomic functioning	Symptom Checklist-90 Revised (SCL-90R); The Stress-related Physical Symptoms Inventory (SPSI); Autonomic functioning test	Overall greater reduction in SCL-90R ($P = 0.002$) and SPSI ($P = 0.0001$) scores but not autonomic functioning pre- vs post-treatment. Comparisons not made between interventions	Not assessed
Simren ²⁵	Not assessed			
Roberts ²³	QOL	IBS-QOL	Overall improvement in QOL ($P < 0.001$) pre- vs. post-treatment. No difference in improvement observed between interventions	Improvement maintained 12-months post-treatment
Lindfors ²²	QOL; anxiety and depression	IBS-QOL; Hospital Anxiety and Depression Scale	Improvement in QOL (mental health, sleep & social role subscales, all $P < 0.05$) pre- vs. post-treatment. A greater reduction in anxiety ($P < 0.05$) but not depression was observed in the GDH compared to control intervention	Improvement maintained 1-year post-treatment
Lindfors ²²	QOL; anxiety and depression	Short Form-36 (SF-36); Hospital Anxiety and Depression Scale	Improvement in physical ($P < 0.05$) but not mental QOL pre- vs. post-treatment. A greater reduction in anxiety ($P < 0.05$) but not depression was observed in the GDH compared to control intervention	Improvement not maintained 1-year post-treatment
Moser ²⁴	QOL; anxiety; depression	SF-36; Hospital Anxiety and Depression Scale	Overall improvement in QOL ($P = 0.006$) and reduction in anxiety and depression in the GDH compared to control intervention	Improvement maintained 1-year post-treatment

GDH, gut-directed hypnotherapy; QOL, quality of life.

widespread use of gut-directed hypnotherapy in patients with IBS or IBD.

Safety of hypnotherapy. Hypnotherapy, when performed by an appropriately qualified and experienced practitioner, is considered exceptionally safe.⁶¹ Only in certain circumstances such as when a patient has a significant

psychological co-morbidity (such as schizophrenia, epilepsy or bipolar disorder) is hypnotherapy contraindicated. Despite this, misconceptions surrounding hypnosis are common and include (i) that hypnosis is a form of mind control where the hypnotised subject has no free will, (ii) hypnosis can be used to accurately recall previous memories, and (iii) that a patient can become 'stuck'

in a state of hypnosis.⁶¹ It is important that the hypnotherapist dispels such misconceptions prior to treatment.

Hypnotic susceptibility. Several scales have been developed to determine how easily a subject can be hypnotised. The most common scales of hypnotic susceptibility include the Harvard Group Scale of Hypnotic Susceptibility⁶² and the Stanford Hypnotic Susceptibility Scale⁶³ both of which can be applied with relative ease. Despite the ease of application, the usefulness of such scales is questionable. While it is well established that people differ in their hypnotic capacities, and despite the great majority of people being able to experience hypnosis, not everyone is equally responsive.⁶¹ For example, hypnotic susceptibility has not been shown to correlate with the effectiveness of therapy amongst IBS populations.^{20, 42}

Issues in the technique applied. The techniques used by different investigating groups have varied according to the number of sessions, the duration of sessions and whether audiotapes are supplied (Table 2). Variations in such details have not been subject to comparative study. These variables would be amenable to study, and is warranted amongst IBS and IBD populations.

Predictors of response. On first principle it seems realistic to offer gut-directed hypnotherapy to those patients most likely to respond and an alternative therapy to those which hypnotherapy is unlikely to be beneficial. However, work conducted to identify predictors of response has produced inconclusive results. The focus has been based primarily on demographic characteristics such as age and gender where a randomised control study has shown no effect.²⁴ Despite this, recent audits have suggested that women with IBS respond more favourably to hypnosis than men.^{34, 42} For example, in the audit of 1000 consecutive patients, 80% of women responded as opposed to 62% of men. However, the observable improvement in men was still encouraging when compared with that obtained in pharmacological studies.⁴² Importantly, bowel habit subtype according to ROME Foundation criteria has no apparent influence on outcomes.⁴² Personality traits, imaginative ability and expectancy have also been explored with some demonstrable effect.^{51, 52} As it currently stands, no conclusive predictors applicable to routine practice have been identified.⁶¹

Timing of hypnotherapy relative to other treatment modalities. Comparison of the rate of response to

gut-directed hypnotherapy in patients with IBS suggests that it is at least as good as some of the new and expensive pharmacological treatment options.²² This together with the fact that there are no known side effects of hypnotherapy make gut-directed hypnotherapy a competitive treatment option.²² Apart from the limitations imposed by the lack of hypnotherapists skilled in gut-directed techniques, the financial burden of a therapeutic course and the time commitment needed (usually between 6 and 12 1-h sessions), one could argue that, in patients who are willing to undertake such a course of therapy, it should be offered early in the management of IBS. However, there are no data for or against such a speculative contention. In practice outside expert, investigative centres, it appears to be most often offered in those who are unresponsive to other treatments, an extremely challenging group.

The challenge of designing high quality studies. Conducting well-designed clinical trials using hypnotherapy is difficult. In order for researchers to be able to draw causal conclusions about the efficacy of an intervention, they must compare the treatment condition with control group that accounts for improvements caused by factors other than the treatment.⁶⁴ In pharmacological studies, the control group can receive treatment identical to that of the experimental group (through a placebo pill) meaning that participants cannot tell whether they are in the experimental or the control treatment.⁶⁴ Therefore, any difference between the groups on the outcome measure should be attributed to the effect of the treatment.⁶⁴ However, pharmacological-standard study designs are difficult in the realm of psychology, where it is almost impossible to match expectations between treatment and control groups.⁶⁴ Participants in psychological interventions typically know what treatment they received. Measuring the effectiveness of a therapy to a no-treatment control condition is, therefore, compromising and possibly inadequate. However, this has been the predominant control used in studies to date. An alternative is to compare the therapy with an active control group, but this too can lead to expectations about the effectiveness of the therapy. Nevertheless, the way forward for gut-directed hypnotherapy may be to compare its performance with a therapy of known efficacy in studies designed to address noninferiority or superiority. For example, gut-directed hypnotherapy could be compared to the low FODMAP (fermentable oligo-, di-, mono-saccharides and polyols) diet, which has well-understood mechanistic action and increasing evidence for efficacy.^{65, 66}

The high placebo response rates, typically between 40% and 70%,⁶⁷ in RCTs of patients with IBS underline the importance of adequate controls and make it more difficult to detect therapeutic gain. There are ways to minimise the risk that apparent efficacy is only the placebo effect. Statistical power to increase confidence that an incremental effect over the control is therapeutic rather than chance is important. Unfortunately, several studies of gut-directed hypnotherapy have not reported size effects and were under-powered, as shown in Table 3.

Another way to help differentiate the placebo from specific effect of a therapy is to report longer term outcomes, well beyond the active therapeutic period. For example, persisting incremental effect of gut-directed hypnotherapy over its control after six or twelve months increases the confidence that the therapeutic benefit is not that of the placebo. This has been previously demonstrated.^{20–24}

Availability of suitably trained hypnotherapists. Very few professionals are trained for the specific implementation of gut-directed hypnotherapy and, therefore, their services can be difficult to access. Importantly, once suitably trained, there does not appear to be any operator-related influence on outcomes.²² Despite this, the practice of hypnotherapy is both time-consuming and expensive. With no available data one can only speculate that while the time and cost associated with a course of gut-directed hypnotherapy can be considerable, it may help to reduce the totalling cost to the economy when patients are repeatedly seeking health care professionals often with limited success.

A possible solution to this issue is to offer group, as opposed to individual, gut-directed hypnotherapy sessions. Gut-directed hypnotherapy has been used

successfully in group settings where improvement was observed for overall gastrointestinal symptoms and psychological manifestations.^{24, 48, 68} This observable improvement was found to be directly comparable to individual gut-directed hypnosis in one study, albeit with small participant numbers.⁴⁸ It may be that implementing group gut-directed hypnotherapy will make it accessible and affordable without reducing the overall effectiveness of the treatment.

CONCLUSIONS

Despite the limitations of study design, evidence is mounting that gut-directed hypnotherapy has durable efficacy in patients with IBS and possibly IBD without apparent safety issues. Where it might sit in the therapeutic arsenal alongside dietary, pharmacological and other therapies, as a primary therapy and/or an adjunct to conventional therapy, cannot be ascertained on the current evidence-base. Further research into efficacy, predictors of response and mechanisms of action are imperative.

AUTHORSHIP

Guarantor of the article: Peter R. Gibson.

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