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Editorial

Electrical induced defecation in constipation: are we running the right way?

Defecación inducida por electro-estimulación en el estreñimiento: ¿vamos en la dirección adecuada?

Constipation is the most common functional disorder of the digestive system and affects around 30% of people in Western countries.¹ A cross section of the population suffer from this condition which covers various clinical subtypes, such as slow transit constipation, difficulty in defecation and combinations of these forms. All of these are characterised by difficult and/or infrequent passage of stools. In the majority of cases, changes in food habits or lifestyle and medicine (often self-medication) can be beneficial, and surgery can help a small group of patients with difficult defecation. However, a small proportion of patients do not respond to conservative treatments and their quality of life can be seriously affected by this disorder.

In 1906 Arbuthnot Lane² first presented a total colectomy and ileorectal anastomosis to treat these difficult patients. Furthermore, extensive basic and clinical research has been carried out to find an efficient drug with enterokinetic properties on colonic motility³; although the results are still not satisfactory.

More recently, armed with a new understanding of the pathophysiological mechanism involved in constipation and while searching for a less invasive approach, there has been an increased interest in the use of electrical-induced defecation.

Electrical stimulation can be applied in several ways, including on the sacral anterior nerve roots through surgery (in patients with spinal injuries)⁴ or by a percutaneous approach through the sacral foramen (sacral nerve stimulation [SNS])⁵; posterior tibial nerve stimulation with a needle⁶; use of an external electromagnetic field⁷; or the stimulation of the smooth muscle layer of the colon.⁸

At the end of the 1970s, the direct stimulation of the anterior sacral nerves was used on patients with spinal injuries to treat urinary retention and possibly, constipation,⁴ but this invasive approach was abandoned after percutaneous techniques of

SNS were developed. However, it was these experiments that opened the way for modern SNS techniques.

Sacral nerve stimulation was presented for treating urinary incontinence at the beginning of the 1980s⁹ and since the end of the last century it has been successfully used in several pelvic floor disorders, including urinary retention,¹⁰ faecal incontinence,¹¹ anal pain¹² and constipation.¹³

Although the efficacy of this technique has been well documented in urinary and faecal incontinence, there continues to be few and limited studies on its use in treating constipation due to the fact that SNS does not “officially” treat constipation.

Results from early experiences in St. Mark's Hospital with a small number of patients indicate that SNS may improve defecation, but its effect on colonic transit time was uncertain.¹³ Recently, a multicentre study¹⁴ that included 65 patients with a mean follow-up of 28 months (between 1 and 55 months) had a very high success rate (73% of patients responded to the temporarily implanted test, and 65% maintained these positive results up until the end of the follow-up period), but these results need to be confirmed. In fact, these patients should have been assessed using an intention-to-treat analysis that only included patients with a minimal follow-up period, as the seriousness of constipation and the effect of SNS can vary over time. The criteria used for selecting patients is another crucial point because some patients treated did not have a delay in transit time during the test with radiopaque markers. Moreover, it is uncertain if the Roma III criteria for the definition of constipation were applied correctly.

Other experiments on the use of SNS for constipation have had less spectacular results (48% success rate in Holzer).¹⁵ Unpublished data on 50 patients with constipation from the Gruppo Italiano di Nneuromodulazione Sacral (Italian group for Sacral Neuromodulation) show that from the 16 patients who

were followed up for a minimum of 3 years, the success rate was 38% and in the intention-to-treat analysis only 6 of the 50 initial patients noticed any long-term benefits with SNS (courtesy of Dr C. Ratto).

After a period of scepticism, posterior tibial nerve stimulation (PTNS) has recently been introduced into clinical practice to treat urinary¹⁶ and faecal¹⁷ incontinence. Electrical stimuli can supposedly travel along the tibial nerve until they reach and activate the pelvic plexus and probably some brain zones.¹⁸

An important difference between SNS and PTNS is that the latter is a temporary stimulation, used one or twice a week for 2-3 months as part of a training programme in rehabilitation. To date, no studies have been published on this technique for treating constipation, but at least two multicentre trials have started in Europe.

Meanwhile, the electrical magnetic stimulation of sacral nerve roots has been proven to reduce colon and rectal excitability and increase anal pressure, probably by inhibiting the anal-cortical pathway,¹⁹ but there are currently no clinical experiments published on patients with constipation.

Finally, an interesting project is currently being carried out in Lausanne on direct colonic stimulation using a microchip sutured into the serous membrane of the sigmoid colon and rectum that is activated using an electromagnetic field. The ColoStim project, financed by Medtronic,⁸ is currently being carried out on animals, but little is known on its possible clinical uses.

More basic and clinical research is still needed on colonic motility in order to identify which type or subtype of constipation, which will not respond to medical treatment, may respond successfully to electro-stimulation and which is the best method to achieve it.

The era when patients with constipation can remotely activate intestinal evacuation is not too far away.

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