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Efficacy of multidisciplinary approach in treatment of constipation: a pilot study

多元專科模式治療便秘之療效：先導研究

Objective. To evaluate a multidisciplinary Hong Kong treatment programme for patients with constipation.

Design. Pilot study.

Setting. A joint collaboration among the departments of surgery, physiotherapy, and dietetics in a regional hospital in Hong Kong.

Patients. Thirty-one constipated patients with normal colonic transit and pelvic floor dyssynergia.

Intervention. Multidisciplinary treatment including dietary modification, bowel habit adjustment, and physiotherapy.

Main outcome measures. Anorectal manometry, fibre intake, subjective improvement, bowel frequency, Bristol score, and straining time and effort.

Results. Significant improvement was found in mean fibre intake, straining time and effort, but not in anal manometric results. A total of 78% of patients demonstrated more than 50% improvement in subjective symptoms, whereas 70% of the patients enjoyed objective improvement in pelvic floor dyssynergia documented by electromyography and anal pressure during a push effort.

Conclusion. The multidisciplinary rehabilitative programme for constipated patients significantly improved symptoms. Electromyography and anal pressure during a push effort are useful tools for objective assessment of the treatment effect.

目的：評估香港一個治療便秘的多元專科模式復康計劃。

設計：先導測試。

安排：香港一所區域醫院的外科、物理治療及營養部門的合作項目。

患者：31 名患有便秘的病人，他們結腸通道正常但有盆骨底肌肉失控。

療法：多元專科模式治療，包括營養膳食方式改善、大便習慣調整及物理治療。

主要測量結果：肛門直腸測壓、纖維攝取量、主觀進度、大便頻率、Bristol評分、用力排便的時間及效果。

結果：除了肛門測壓讀數外，平均纖維攝取量及用力排便的時間和效果均有明顯改善。78%的病人有超過50%的主觀徵狀改善；肌電圖檢查結果及肛門用力排便時的壓力顯示有 70% 的病人盆骨底肌肉失控有客觀徵狀改善 。

結論：多元專科模式復康計劃對於改善便秘的徵狀具有明顯的效果。肌電圖檢查及肛門用力排便時的壓力能有效地客觀評估治療效果。

Key words:
Anal canal;
Constipation;
Digestive physiology;
Rectum

關鍵詞：
肛門；
便秘；
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直腸

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Introduction

Constipation is a common condition contributing to major physical, social, and psychological impairment. Idiopathic constipation may be due to an abnormality in colonic transit or evacuation or both. Evacuation problems are usually caused by incoordination of the pelvic floor muscles during defaecation, otherwise known as pelvic floor dyssynergia or dysfunction. The causes of constipation are multifactorial; both physiological abnormalities in colonic motility or muscle incoordination and psychological factors play an important role. Biofeedback training is a treatment modality for pelvic floor dyssynergia with variable success rates.[1] We focused on a specific subgroup of patients who had normal colonic transit but did have pelvic floor dyssynergia. As biofeedback only targets physiological aspects, to optimise treatment outcome, other aspects such as patient's psychology and diet also need to be addressed. Thus, nursing

interventions enhancing the patient's understanding and sense of control as well as dietary modification warrant implementation. We therefore aimed to evaluate such a multidisciplinary rehabilitative programme in Hong Kong for the treatment of constipation, and to examine the usefulness of anorectal physiology (ARP) testing for assessing the response of treatment.

Methods

Patients

Between July 2003 and July 2004, patients diagnosed with chronic constipation using the Rome II criteria,[2] who had a normal transit time (as judged by transit marker studies) were recruited. Those with obvious clinical features of irritable bowel syndrome or other causes of constipation secondary to medical disorders such as thyroid dysfunction were excluded. Colonoscopy or barium enema was performed in selected patients to exclude any organic pathology.

Investigation

Anorectal physiology assessments and defaecation proctography were performed before and after treatment. Anorectal physiology was tested using a water perfusion system (Zinetics Anorectal Manometric Catheter; Medtronics, Skovlunde, Denmark) on patients lying in a left lateral position. The profile of ARP tests included anal manometry, rectal volumes, anorectal inhibitory reflex, and electromyography (EMG). The parameters assessed included maximum resting pressure (MRP), maximum squeeze pressure (MSP), volume of first sensation, volume at first urge, and maximum tolerable volume. Defaecation proctography is a simulation of defaecation in which the process is seen under standard fluoroscopic control. Barium sulphate thickened with porridge oats is placed into the rectum by a caulking gun. Subjects were instructed to contract and relax the pelvic floor muscle and to attempt defaecation during the examination. The dynamic changes in the anatomy of the anus, rectum, and the pelvic floor were seen and pathologies such as pelvic floor dyssynergia, intussusception, or rectocele diagnosed. Pelvic muscle dyssynergia or incoordination is defined as: (i) a paradoxical anal contraction (detected by manometry) and augmentation of activity (based on EMG recordings) during a push effort or (ii) lack of pelvic floor and puborectalis muscle relaxation during defaecation (based on defaecation proctography).

Treatment

The multidisciplinary approach involved collaboration of surgeons, nurse specialists, physiotherapists, and dieticians. The treatment course lasted 6 months. Individual patient progress was discussed and treatment plans designed in a monthly meeting supervised by a colorectal surgeon.

Nursing intervention

The nurse specialist educated the patients on the physiology and anatomy of digestion and defaecation, and discussed each patient's defaecation habits and rectified misconceptions. This was to increase patient understanding and the sense of self-control over their condition. A self-reporting stool chart was used to document each patient's bowel habit pattern. Daily bowel frequency, stool consistency (graded according to the Bristol score), and straining time and effort were recorded after each defaecation episode. The patient was instructed to evaluate their straining effort according to a three-point scale (1=mild effort, 2=moderate effort, 3=maximum effort). After completion of the treatment course, patients were asked to evaluate the percentage improvement in bowel habit and symptoms.

Physiotherapy

Patients visited the physiotherapist once a week for the first 3 months and then once a month for the subsequent 3 months. Information on proper defaecation dynamics and abdominal breathing exercise was conveyed to each patient to facilitate effective defaecation. Individuals were advised to practise at home 3 times a day and document their efforts on an exercise chart. Manometric biofeedback training using the Myomed (Enraf Nonius, Delft, Holland) was performed in the final three sessions. An anal pressure sensor was inserted into the anal sphincter, which enabled patients to observe their efforts during contraction, relaxation, and push on a monitor screen.

Dietician

Fibre intake was calculated before and after therapy. Dietary modification was suggested, and tailored to each patient's medical condition and preferences.

Statistics

The paired *t* test was used to analyse recorded parameters before and after treatment.

Results

During the 12-month period, 31 constipated patients (6 men and 25 women) were diagnosed to have pelvic floor incoordination. Three men and five women defaulted or refused treatment. The mean age of the remaining 23 patients who completed the treatment course was 46 years. A statistically significant improvement following treatment was found with respect to bowel habit, fibre intake, mean straining time, level of straining effort, and the Bristol score (Table 1). No significant difference accrued based on gender as a covariate.

There were no statistically significant differences with respect to anorectal manometry findings including: MRP, MSP, and rectal volumes (Table 2). After treatment, 18 (78%) patients reported ≥50% improvement of bowel habit and symptoms, whereas 16 (70%) patients showed correction in pelvic muscle incoordination as defined by the disappearance of paradoxical anal contraction on

Table 1. Changes in bowel habit and fibre intake

Characteristic	Pre-treatment	Post-treatment	P value
Mean (SD) bowel motions per week	5.7 (8.7)	6.1 (8.1)	0.04
Mean (SD) straining time per bowel motion (minutes)	14.0 (7.3)	6.6 (6.0)	0.00
Mean (SD) straining effort per bowel motion	2.6 (0.12)	1.5 (0.12)	0.002
Mean (SD) fibre intake per day (g)	11.2 (4.4)	15.0 (7.6)	0.04
Median Bristol score (range) [possible range: 1-6]	2 (1-3)	3 (1-4)	0.006

Table 2. Changes in manometric pressures and volumes

Manometric parameter	Pre-treatment*	Post-treatment*	P value
Maximum resting pressure (cm H_2O)	89.8 (28.9)	86.6 (26.8)	0.70
Maximum squeeze pressure (cm H_2O)	139.2 (51.8)	136.3 (41.7)	0.83
First sensation volume (mL)	85.5 (33.0)	92.5 (34.6)	0.49
First urge volume (mL)	141.3 (55.6)	141.7 (58.4)	0.98
Maximum tolerable volume (mL)	198.6 (87.4)	186.6 (72.3)	0.61

* Values are shown in mean (SD)

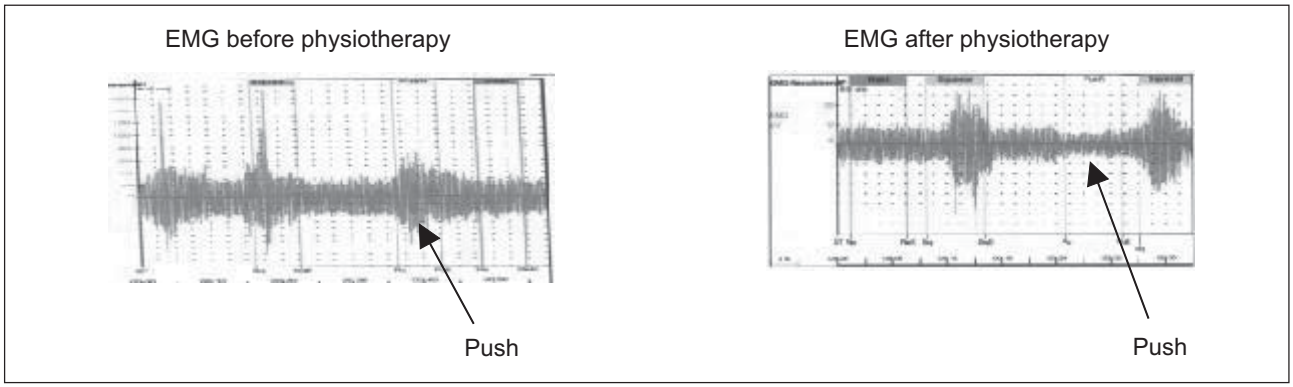

Fig 1. Correction in pelvic muscle incoordination before and after physiotherapy
Disappearance of paradoxical anal contraction on electromyography (EMG) as reflected by the absence of augmentation

manometry and absence of pelvic floor contraction (based on EMG) during a push effort (Fig 1).

Discussion

According to physiological testing, pelvic floor dyssynergia is responsible for chronic constipations in about 46% of patients.[3] Biofeedback therapy is a useful treatment option,[4,5] which involves the practice of coordinated relaxation of the pelvic floor muscle and an effective increase in intra-abdominal pressure (Valsalva manoeuvre). Normally, manometric tracings reveal an increase in rectal pressure reflecting an increase in intra-abdominal pressure and a simultaneous decrease in anal pressure detected by rectal and anal transducers, respectively (Fig 2).

A multidisciplinary approach in the treatment of constipation significantly improved both subjective symptoms and objective anorectal findings, consistent with the best results from published data.[6] The involvement of nurse specialists and dieticians appeared to improve treatment outcomes. The nurse specialists provided suitable defaecation instruction, which appeared to increase each patient's knowledge and understanding of their condition. This resulted in a better sense of self-control and appropriate expectations, ultimately leading to increased compliance and satisfaction. The dietician provided dietary advice on increasing fibre intake; stools were perceived to be softened, which tackled complaints of 'hard stool'.

The favourable results from this pilot study provide the basis for a larger controlled trial. Such a study could assess the efficacy of each aspect of treatment (biofeedback, education, diet) individually or as a multidisciplinary strategy.

The absence of changes in anal manometric parameters and rectal volumes suggests that biofeedback training does not alter the anatomy of the anorectum. Other reports have also confirmed that anorectal physiological parameters do not correlate with or predict treatment outcome.[7] Symptomatic improvement, in terms of a decrease in straining time and effort, was consistent with improved coordinated action of the pelvic floor muscles during defaecation. This effect was supported by the changes in anal pressure and EMG during a push effort. Therefore, instead of measuring anal manometric pressures and rectal volumes to study the treatment of constipation, we suggest that assessing dynamic changes in rectal and anal pressure during a push effort (Fig 2) or using EMG will prove more informative.

Conclusion

The success rate of our multidisciplinary approach for the treatment of constipation in patients with pelvic floor

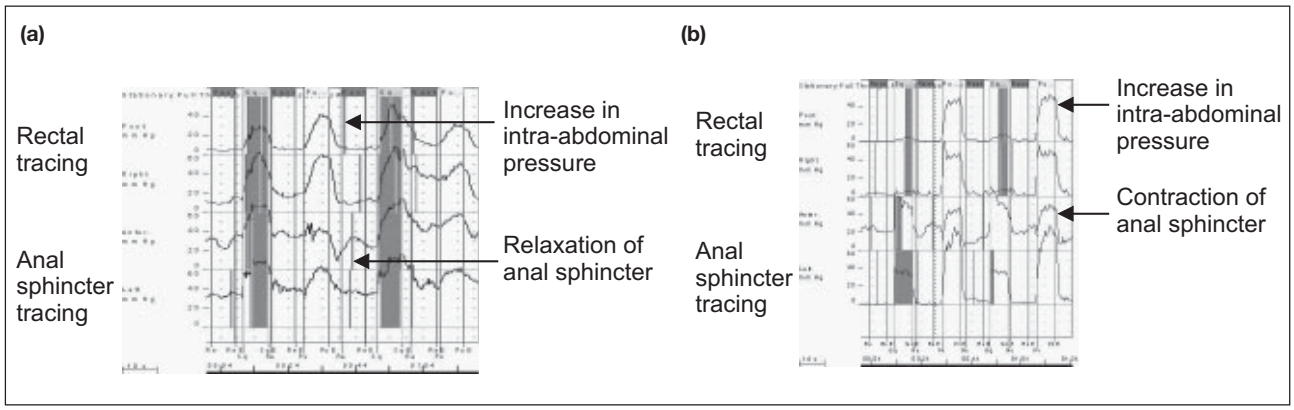

Fig 2. Manometric tracings during a defaecation attempt
(a) Normal pattern of defaecation in manometry revealing an increase in rectal pressure, reflected by an increase in intra-abdominal pressure and a simultaneous decrease in anal pressure. **(b)** Abnormal pattern of defaecation in manometry revealing paradoxical increase in anal pressure with a simultaneous increase in intra-abdominal pressure during a defaecation attempt

dyssynergia was high. Electromyography and anal pressure monitoring during a push effort may be useful for objective assessment of treatments.

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