



Constipation: a potential cause of pelvic floor damage?

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Abstract

Background Pelvic floor damage is a major clinical problem usually attributed to obstetric injury. We speculated that constipation may also be an aetiological and preventable factor resulting from repeated stress on the perineum over many years, and this study aimed to test this hypothesis. **Methods** A total of 600 women attending a gynaecological clinic were assessed using a structured questionnaire gathering data on pelvic floor damage, constipation and obstetric trauma. Complete data were available on 596 subjects. **Key Results** The prevalence of pelvic floor damage was 10% (61/596). In this group, constipation was identified in 31% (19/61) of women and obstetric trauma in 31% (19/61). In the group without pelvic floor damage, constipation was present in 16% (86/535) and obstetric trauma in 16% (83/535). In univariate analysis, pelvic floor damage was associated with age (OR: 1.05; 95% CI: 1.03–1.08; $P < 0.0001$), constipation (OR: 2.36; 95% CI: 1.31–4.26; $P < 0.0001$) and obstetric trauma (OR: 2.46; 95% CI: 1.37–4.45; $P < 0.0028$). In multivariate analysis, the OR for age was 1.05 (95% CI: 1.03–1.08; $P < 0.0001$), for constipation 2.35 (95% CI: 1.27–4.34; $P < 0.0001$) and for obstetric trauma 1.37 (95% CI: 0.72–2.62; $P = 0.3398$). **Conclusions & Inferences** Constipation appears to be as important as obstetric trauma in the development of pelvic floor damage. Thus, a more proactive approach to recognizing and treating

constipation might significantly reduce the prevalence of this distressing problem.

Keywords anal incontinence, constipation, functional outlet obstruction, pelvic floor.

INTRODUCTION

Pelvic floor damage can affect a variety of urological, gynaecological and proctological structures, resulting in a range of disorders in their function.^{1–4} The problem affects large numbers of women and can be particularly difficult to manage.^{2,3,5,6} It has been customary to attribute pelvic floor damage to obstetric trauma; however, little attention has been paid to other possible causal factors.^{5,7–16}

We hypothesized that chronic constipation, which is associated with repeated straining and stress on the perineum,^{17–20} may constitute an aetiological factor in pelvic floor^{17,19,20} damage, and our aim was to determine whether constipation is associated with this condition.

PATIENTS AND METHODS

Study design

This unicentre cross-sectional study was undertaken in female outpatients who consecutively attended the gynaecological clinic. Patients were studied systematically for the presence of a variety of parameters related to pelvic floor damage, constipation and obstetric trauma. The study protocol was designed in accordance with the Helsinki Declaration, approved by the Institutional Review Board of the Vall d'Hebron University Hospital and all participants gave their written informed consent.

Study population

Patients were excluded if they were pregnant, less than 6 month postpartum, had severe co-existent disease or were under 18 years of age.

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Procedures and definitions

Using a structured interview and physical examination, the following symptoms and structural abnormalities were systematically recorded on a data collection sheet.

Pelvic floor damage criteria included: (i) urinary or (ii) anal incontinence, (iii) cystocele, defined as descent of the urinary bladder with protrusion into the anterior vaginal wall; (iv) hysterocele, defined as descent of the uterus into the vagina; (v) rectocele, defined as a flaccid rectovaginal wall with rectal protrusion into the vaginal lumen; (vi) rectal prolapse, defined as eversion and exteriorization of the rectal wall through the anal verge; criteria (iii)–(v) were considered positive if fulfilling at least stage I criteria of the pelvic organ prolapse quantification system^{21,22}. Pelvic floor damage was defined in this study as the presence of three or more criteria (symptoms and/or structural abnormalities).

Constipation criteria included the regular occurrence (25% of the time or more) of (i) straining, (ii) sensation of anal blockage during defecation, (iii) digital facilitation of defecation, (iv) sensation of incomplete evacuation, (v) passage of hard stools, (vi) occurrence of fewer than three bowel movements per week and (vii) the regular use of laxatives, enemas or suppositories. Constipation was defined in this study as the presence of three or more criteria.

Obstetric trauma was defined as the presence of at least two of the following criteria: (i) weight of newborn over 3500 g, (ii) history of dystocia (including forceps, 3rd–4th degree tears) and (iii) three or more labours, provided that birth weight was over 2500 g in any case.

Statistical analysis

Sample size This study was designed assuming 11% (internal data) of the participants presented pelvic floor damage according to the definition employed. It was calculated that a representative sample for a cross-sectional study should include 602 subjects, assuming the normal approximation and a range of $\pm 2.5\%$ for a two-sided 95% CI.

Statistical comparisons A descriptive analysis was performed for baseline patient characteristics. Continuous data were summarized as mean \pm SD (range), and categorical data were summarized as percentages. Factors associated with pelvic floor damage were assessed by univariate and multivariate logistic regression

models, and included: age, constipation and obstetric trauma. Moreover, the frequency of constipation and obstetric trauma were compared between women with and without pelvic floor damage using chi-square test or Fisher's exact test, as appropriate. Odds ratios (OR) and their 95% CI were estimated from logistic regression, and a *P*-value less than 0.05 was considered significant.

Complete data collection was recorded on a database program (MICROSOFT ACCESS 97 for WINDOWS, Redmont, CA, USA). Data analysis was performed using the statistical software package SAS version 9.1 (SAS Institute Inc. Cary, NC, USA).

RESULTS

Six hundred women who met the inclusion criteria were invited to participate in this study. Four declined to participate; thus, complete data were available for 596 women, age range 18–79 years, mean (\pm SD) age 42 ± 13 years. The reason for consultation was a routine check-up in 86.8%, family planning in 2.8%, pelvic floor dysfunction in 3.5%, breast disease in 1.2%, menstrual dysfunction in 1.7%, and other causes in 4%. Twenty-seven per cent of patients had no vaginal deliveries. Twenty-one per cent had one, 36% had two, 11% had three and 4% had four vaginal deliveries.

Some degree of pelvic floor damage was present in almost half of the participants, and 61 of 596 patients (10%) had three or more abnormalities (Table 1). Overall, 25% had urinary incontinence, 3% anal incontinence, 30% cystocele, 9% hysterocele and 15% rectocele.

One or more criteria for constipation were present in 264 (44%) participants, and three or more constipation criteria in 105 out of 596 participants (18%). Overall, 19% had fewer than three bowel movements per week, 21% regularly used laxatives, enemas or suppositories, 34% reported hard stools, 16% straining, anal blockage and/or digital facilitation of defecation, and 18% a sensation of incomplete evacuation.

Table 1 Frequency and risk (adjusted* odds ratio 95% CI) for pelvic floor damage in relation to constipation and to potential obstetric injury

	Constipation†	Obstetric injury
	Yes (<i>n</i> = 105) vs No (<i>n</i> = 491)	Yes (<i>n</i> = 102) vs No (<i>n</i> = 494)
Pelvic floor damage		
≥ 2 alterations	35% (<i>n</i> = 37) vs 19% (<i>n</i> = 94) 2.38 (1.47–3.85); <i>P</i> = 0.0001	32% (<i>n</i> = 33) vs 20% (<i>n</i> = 98) 1.18 (0.71–1.98) <i>P</i> = 0.51
≥ 3 alterations	18% (<i>n</i> = 19) vs 9% (<i>n</i> = 42) 2.43 (1.32–4.47) <i>P</i> = 0.004	19% (<i>n</i> = 19) vs 9% (<i>n</i> = 42) 1.51 (0.80–2.86) <i>P</i> = 0.20
≥ 4 alterations	11% (<i>n</i> = 12) vs 4% (<i>n</i> = 20) 3.16 (1.45–6.87) <i>P</i> = 0.004	9% (<i>n</i> = 9) vs 5% (<i>n</i> = 23) 1.07 (0.45–2.53) <i>P</i> = 0.87

Comparisons of values in women with vs without constipation and with vs without risk factors for obstetric injury.

*Adjusted for age.

†Constipation with three or more criteria.

Table 2 Unadjusted and adjusted odds ratios and 95% CI for risk of having pelvic floor damage

	Unadjusted			Adjusted*		
	OR	95% CI	<i>P</i>	OR	95% CI	<i>P</i>
Age	1.05	1.03–1.08	<0.0001	1.05	1.03–1.08	<0.0001
Constipation	2.36	1.31–4.26	<0.0001	2.35	1.27–4.34	<0.0001
Obstetric trauma	2.46	1.37–4.45	0.0028	1.37	0.72–2.62	0.3398

*Adjusted for age, constipation and obstetric trauma.

One or more criteria for obstetric trauma were present in 379 women (64%) and 102 (17%) had two or more criteria. Overall, 9% had newborns over 3500 g, 46% reported a history of dystocia, and 17% had three or more labours.

The type of pelvic floor damage, i.e. whatever the combination of features, was similar regardless of whether it was associated with constipation or with obstetric trauma (as defined above). Constipation was present in 31% (19/61) of women with pelvic floor damage but in only 16% (86/535) of those without ($P = 0.0034$). Constipation, regardless of its specific manifestations, was related to pelvic floor damage: 18% of the subgroup of women with pelvic floor damage and constipation, reported fewer than three bowel movements per week, 20% laxative use, 13% hard stools, 16% difficult evacuation (straining, anal blockage and/or digital facilitation) and 16% incomplete evacuation. A history of obstetric trauma was more frequent in women with pelvic floor damage (31%, 19/61) than in those without (16%, 83/535; $P = 0.0021$).

Table 2 shows the risk factors associated with pelvic floor damage (3 or more criteria) in the univariate and multivariate analysis. The ORs for the univariate analysis adjusted for age were 2.43 for constipation (95% CI: 1.32–4.47; $P < 0.0044$) and 1.51 for obstetric trauma (95% CI: 0.80–2.86; $P = 0.2055$).

DISCUSSION

The results of this study suggest that constipation may be a major factor in the development of pelvic floor damage, with an impact at least as important as obstetric trauma. In fact, constipation was an independent risk factor for pelvic floor damage in multivariate and univariate analyses, and age was associated. By contrast, obstetric trauma was only a risk factor in univariate analyses.

The urinary, genital and digestive systems all open into the external environment through the perineal region. The pelvic organs of these different systems share common muscular and connective structures known as the pelvic floor which provides support and

facilitates specific functions.^{4,23,24} The prevalence of pelvic floor damage among patients with constipation was significantly higher than in those without. It is noteworthy that the probability of developing pelvic floor damage was approximately the same for constipated patients as for patients with risk for obstetric trauma and, if anything, the association of pelvic floor damage with constipation was somewhat stronger than with risk factors for obstetric trauma. However, our results reflect an association and not cause effect; hence, it may also be possible that pelvic floor damage causes constipation.

In our study, clear-cut and objective criteria were used to define pelvic floor damage involving both structural, i.e. -celes and prolapses, and functional parameters, i.e. urinary and anal incontinence. We acknowledge that with this restricted definition, for instance not including perineal pain, the real prevalence of pelvic floor damage may have been underestimated.

Traditionally, obstetric trauma had been thought to be responsible for pelvic floor damage in women^{5,6,8–15} As a detailed history of obstetric trauma was not practical in the large population studied, we enquired about circumstances that are well known to involve a high degree of obstetric stress and potential damage, and found that women with such factors had a higher prevalence of pelvic floor damage than those without; however, this association was not statistically significant when adjusted for age. One potential explanation is that older women were more likely to have sustained obstetric trauma.

The definition of constipation was based on currently used criteria, including objective manifestations, such as stool consistency and frequency, and subjective sensations, such as straining, sensation of anal blockage and sensation of incomplete evacuation. The relevance of the various constipation criteria in relation to pelvic floor damage was studied by testing the specific weight of different combinations and cut-offs.^{17,18} At variance with the standard definition,¹⁸ for purposes of this study the use of laxatives, enemas or suppositories was included among the criteria as it is a

confounding factor that may mask a true constipation. Nevertheless, to compensate for this inclusion, we required at least three criteria, instead of the standard two, to be present. Constipation, using our definition, was found to affect about one-fifth of the population studied, a figure similar to that reported in large population-based studies.^{18,25–28} The prevalence of pelvic floor damage among patients with constipation was significantly higher than in those without. It is noteworthy that the probability of developing pelvic floor damage was approximately the same for constipated patients as for patients with risk for obstetric trauma and, if anything, the association of pelvic floor damage with constipation was somewhat stronger than with risk factors for obstetric trauma. However, our results reflect an association and not cause effect; hence, it may also be possible that pelvic floor damage causes constipation.

The potential for damage to the pelvic floor depends on the particular function involved. Micturition, menstruation and sexual intercourse do not compromise the pelvic floor, and the same applies to normal defecation because an appropriate relaxation of the anal sphincters allows faecal evacuation with only mild abdominal compression.^{17,20,29} However, in the case of constipation, which affects up to 20% of the population, the situation is completely different. In constipated patients, faecal evacuation requires forceful abdominal compression,^{18,20,29} with this procedure having to be repeated as often as 10 000–15 000 times by middle age; in these conditions, repeated perineal stress has progressive deleterious effects.^{30–34} Childbirth can be damaging to the pelvic floor, particularly when accompanied by dystocia, high birth weight or

multiparity;^{5,8–15} however, compared to defecation, this is an infrequent event. We acknowledge that, in this exploratory cross-over sectional study, no physiological tests were performed to characterize constipation, and conceivably, pelvic floor damage depends on the specific pathophysiological mechanisms involved. Indeed, constipation due to impaired relaxation of the anal sphincter is frequently associated with forceful abdominal compression to overcome the functional outlet obstruction, whereas the perineal stress involved in slow-transit constipation may be minimal.

This study has important implications as it represents the identification of a potentially avoidable cause of pelvic floor trauma in particular, as in most cases constipation is relatively easy to treat. As so few cases of constipation reach the gastroenterologist, prevention strategies would need to involve a wide range of healthcare providers including general practitioners and, possibly, even paediatricians.

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CONFLICT OF INTEREST

S.V. has received honoraria for collaborating with Laboratorios Dr Esteve for work unrelated. The remaining authors declare that no conflict of interest exists.

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