

## STORAGE SYMPTOMS OF BLADDER AND BOWEL AND THEIR CORRELATION IN ANAL CONTINENT, FLATAL INCONTINENT AND FECAL INCONTINENT WOMEN.

### Hypothesis / aims of study

The prevalence and epidemiology of urinary incontinence (UI) and fecal incontinence (FI) and their combination has been studied intensely. However, no data could be found showing if other symptoms of bladder and bowel storage differ in women with or without FI. The first aim of this study was therefore to describe and compare symptoms of bladder and bowel storage in anal continent women, flatal incontinent women and women with FI. Because storage pathology of bladder and bowel frequently concurs, the second aim of the study was to investigate whether bladder and bowel storage symptoms correlate in these groups.

### Study design, materials and methods

By means of a validated bladder and bowel questionnaire, data were collected from 571 female patients attending the functional pelvic clinic of our hospital.

The following storage symptoms were questioned for both bladder and bowel: reason to evacuate (without a desire: on the clock or as precaution, or, with a (strong) desire), ability to postpone evacuation when a desire or strong desire occurs, involuntary loss of urine (UI) or of liquid or solid stool (FI), incontinence is activity-related and/or urgency-related. Specific bowel storage symptoms questioned were: involuntary loss of flatus and defecation frequency (per week). The following bladder storage symptoms were questioned: urgency, nocturia and voiding frequency. Finally the following patient data were gathered: age, pregnancy, mode of delivery, parity, hysterectomy, medication (mainly antimuscarinics, benzodiazepines and medication with anticholinergic side effects) and medical history. The urological questions are consistent with the guidelines proposed by the International Continence Society (ICS) in 2005 (1). The gastroenterological questions are consistent with the Rome III diagnostic criteria for functional bowel and anorectal disorders (2).

The patients were divided into three groups: anal continent (AC) patients (no incontinence for flatus, liquid or solid stool), flatal incontinent (FLI) patients (incontinence for flatus, but not for liquid or solid stool) and fecal incontinent (FI) patients (incontinence for liquid or solid stool). Women not responding to all questions required for classification into one of these 3 groups were excluded from the study. Three types of UI were described: stress UI (SUI), urge UI (UII) and mixed UI (MUI). Definitions are according to the terminology report by the ICS and IUGA. Frequency was defined according to the National Institutes of Health definition, and considered present when the patient reported eight or more voids per 24 hours.

Statistical analysis was performed with SPSS V 15 (SPSS Inc., Chicago, IL, USA). The Pearson Chi Square test was used to compare categorical variables between groups and to evaluate correlations between bladder and bowel storage symptoms within the different groups. Yate's correction was applied where expected frequencies were less than 5 in a 2X2 contingency table. A one-way ANOVA, with post-hoc Bonferroni, was used to compare the continuous variables between the three groups. Statistical significance was set at  $P < 0.05$ . Statistical power was calculated post-hoc for each correlation ( $\alpha$  level 0.05).

### Results

A total of 546 female patients were included in the study: 212 in the AC group, 216 in the FLI group and 118 patients in the FI group. FI patients were older than AC and FLI patients ( $61 \pm 14$ ,  $51 \pm 17$  and  $55 \pm 17$  years respectively) and reported significantly more pregnancies (88.6% vs 76.4%), vaginal deliveries (86.1% vs 71.4%) and hysterectomies (43.2% vs 27.8%) than AC patients. No difference in parity, medical history and medication was found between the groups. Table I shows the storage symptoms for bladder and bowel in the three study groups.

In AC patients, a correlation was found between bowel and bladder for postponing evacuation when a desire or a strong desire to evacuate occurred ( $P=0.026$  and  $P=0.000$ ), and, between the inability to postpone defecation with a desire or a strong desire

**TABLE I: Storage symptoms of bladder and bowel and their correlation in anal continent (AC), flatal incontinent (FLI) and fecal incontinent (FI) women.**

	AC (n=212)	FLI (n=216)	FI (n=118)
<b>BOWEL STORAGE SYMPTOMS</b>			
Defecation frequency (/week)	7,28 ± 5,22 <sup>3</sup>	8,93 ± 9,86 <sup>3</sup>	14,71 ± 12,78 <sup>1,2</sup>
Defecates with a desire to defecate	188 (90,4%)	201 (95,3%) <sup>3</sup>	99 (88,4%) <sup>2</sup>
Can postpone defecation at a desire to defecate	183 (86,7%) <sup>2,3</sup>	167 (78,4%) <sup>1,3</sup>	41 (36,3%) <sup>1,2</sup>
Can postpone defecation at a strong desire to defecate	127 (63,2%) <sup>2,3</sup>	105 (52,2%) <sup>1,3</sup>	21 (20,4%) <sup>1,2</sup>
Difficulty containing flatus			74 (65,5%)
Fecal Incontinence			
Activity-related			8 (9,5%)
Urgency-related			70 (83,3%)
Combination of both			6 (7,1%)
<b>BLADDER STORAGE SYMPTOMS</b>			
Micturition frequency (/week)	49,89 ± 30,73	50,20 ± 27,68	47,22 ± 27,88
Nocturia	160 (84,2%) <sup>3</sup>	179 (88,6%)	105 (93,8%) <sup>1</sup>
Frequency	83 (42,8%)	92 (47,4%) <sup>3</sup>	38 (34,5%) <sup>2</sup>
Voids with a desire to void	143 (91,1%)	141 (88,1%)	75 (89,5%)
Can postpone micturition at a desire to void	134 (64,7%) <sup>3</sup>	127 (59,1%)	54 (47,8%) <sup>1</sup>
Can postpone micturition at a strong desire to void	70 (35,2%)	65 (31,6%)	31 (29,8%)
Urgency	124 (60,2%)	139 (67,5%)	81 (71,1%)
Urinary Incontinence (UI)	120 (56,9%) <sup>2</sup>	145 (67,4%) <sup>1</sup>	78 (66,1%)
Type of UI	<sup>3</sup>	<sup>3</sup>	<sup>1,2</sup>
SUI	51 (48,1%)	80 (59,7%)	21 (29,6%)
UUI	39 (36,8%)	32 (23,9%)	34 (47,9%)
MUI	16 (15,1%)	22 (16,4%)	16 (22,5%)

Defecation frequency and micturition frequency were presented as mean ± standard deviation, the other parameters as number of positive answers and valid percent (between brackets).

<sup>1</sup> Differs ( $P<0.05$ ) from the AC group, <sup>2</sup> Differs ( $P<0.05$ ) from the FLI group, <sup>3</sup> Differs ( $P<0.05$ ) from the FI group

The statistical power for each significant difference was ≥ 0.99.

to defecate, and urinary urgency ( $P=0.010$  and  $P=0.010$ ). Such correlations were not found in the FLI and FI patients.

In the FI group the majority of patients loose stool due to urgency, with or without UI (82% vs 86%). The type of UI, however, differs in the presence or absence of FI ( $P=0.001$ ): patients with FI report more UUI as opposed to more SUI in AC and FLI patients.

#### Interpretation of results

Our study shows a clear difference in bowel storage symptoms between FI, FLI and AC patients. FI patients defecate twice as often per week compared to FLI and AC patients and have great difficulty postponing defecation when a desire or strong desire to defecate occurs. The majority of the FI patients had fecal urgency incontinence (FUI).

The women in our study reported very similar bladder storage symptoms regardless of the presence of FLI or FI. We showed a clear association between the type of UI reported and the presence of FI. Apart from an increased prevalence of UUI, women with FI also report a high prevalence of nocturia (94%), urgency (71%) and frequency (35%), all symptoms of overactive bladder.

A correlation between similar bladder and bowel storage symptoms could be shown in AC patients. In patients with anorectal pathology (FLI or FI) this correlation disappeared.

#### Concluding message

Our study showed a difference in bowel storage symptoms, and in few bladder storage symptoms, between anal continent, flatal incontinent and fecal incontinent women attending a functional pelvic clinic. Our study suggests a correlation in the type of FI and UI. The correlation between other bladder and bowel storage symptoms in anal continent patients disappeared. In patients with anorectal pathology (FLI or FI).

#### References

1. Donovan J, Bosch R, Gotto M et al. Symptom and Quality of Life Assessment. In: Abrams P, Cardozo L, Khoury S, Wein A, editors. 3rd ed. Paris: Editions 21; 2009. 519-584.
2. Longstreth GF, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller RC. Functional bowel disorders. *Gastroenterology* 2006;130(5):1480-1491.

**Specify source of funding or grant**

**FWO: Fonds Wetenschappelijk Onderzoek Vlaanderen/ Research Foundation – Flanders**

**Is this a clinical trial?**

**No**

**What were the subjects in the study?**

**HUMAN**

<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Comité voor Medische Ethiek - Universitair Ziekenhuis Antwerpen Prof Dr P Cras
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes