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Symptoms of anal incontinence and difficult defecation among women with prolapse and a matched control cohort

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OVERVIEW

Symptoms of anal incontinence (AI) and difficult defecation (DD) were compared in women with and without pelvic organ prolapse. Our goal was to determine whether risk for AI and DD was increased in the control group and to identify any association with symptom severity in the prolapse group.

Background and Objective

Studies describing the “type and frequency of symptoms in women with symptomatic prolapse” have been identified as a research priority by the National Institute of Child Health and Human Development. The current secondary analysis sought to determine whether 1) increased risk for anal incontinence and difficult defecation (DD), characterized by needing to push on the vagina or rectum to complete a bowel movement, exists among these cohorts and 2) women with pelvic organ prolapse demonstrate characteristics or findings associated with greater symptom severity.

Materials and Methods

From November 2000 through October 2004, 286 women were recruited to participate in a study of soft tissue defects leading to pelvic organ prolapse. The cohorts consisted of 151 cases with prolapse at least 1 cm beyond the hymen (cases) and 135 women with all areas of vaginal support at least 1 cm above the hymen (controls).

A questionnaire protocol included a section on age, race, reproductive and surgical history, and multiple items related to bowel dysfunction. The questions for anal incontinence were:

- Do you lose gas from the rectum beyond your control?
- Do you lose stool beyond your control if your stool is loose or liquid?
- Do you lose stool beyond your control other than during an episode of diarrhea?

Patients were given the following options to estimate how frequently these events occurred: never, on an occasional day, on most days, or every day.

The questions for DD were:

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- Do you have to push on the vagina or around the rectum to have a complete bowel movement?
- Do you need to strain hard to have a bowel movement?
- Do you feel that you have not completely emptied your bowels?

Patients were given the following options to estimate how frequently these events occurred: never, with an occasional bowel movement, with most bowel movements, or generally with every bowel movement.

Vaginal support was described with the pelvic organ prolapse quantification (POPQ).¹² The strength of the pelvic floor muscles with voluntary contraction was assessed as “good, fair, poor, or absent” with digital palpation. An instrumented vaginal speculum was used to assess resting vaginal closure force (VCF^{REST}) and maximum vaginal closure force (VCF^{MAX}). The augmentation of vaginal closure (VCF^{AUG}) was calculated as the difference between VCF^{MAX} and VCF^{REST} .

POPQ stages of the cases with prolapse were stage II, 46 (30.5%); stage III, 101 (66.9%); and stage IV, 4 (2.6%). Because this staging did not provide satisfactorily sized groups, three more equally distributed groups of cases with prolapse beyond the hymen were developed: small ($+1$ cm, $n=46$), medium ($+2$ to $+3$ cm, $n=64$), and large ($\geq +4$ cm, $n=41$).

Results

Among cases, more than one third of patients (35.2%, 52/147) had symptoms of either incontinence of flatus or DD. Symptoms of both were experienced by only 6.1% (9/147). The Table summarizes how frequently symptoms of AI and DD were reported by women with prolapse and a control group matched for age, race, and hysterectomy status. The likelihood of incontinence of flatus was 3-fold greater. The likelihood of DD ranged from 5- to 19-fold greater for cases compared to controls. Odds ratios for the increased likelihood of incontinence of liquid and solid stool were not calculated because the symptoms were not present in the control group.

Subjects reporting incontinence of flatus on “most days” or “every day” had a higher mean parity, were more likely to demonstrate urinary incontinence during a standing full bladder stress test, and had a higher resting vaginal closure force than controls. Too few patients reported incontinence of solid or liquid stool for this type of analysis to be meaningful.

Women reporting DD had a longer mean perineal body when straining and were more likely to have good or fair strength by palpation. These women were more likely to have a small prolapse, to have normal levator ani muscles or minor levator ani defects than major defects, and to have a prolapse with a posterior leading edge ($P=.062$).

Women who reported a feeling of not completely emptying with most or every bowel movement had higher mean parity (2.7 ± 1.5 vs 3.7 ± 2.3 , respectively; $P<.005$) and were more likely to have a positive standing cough stress test (41.2% vs 21%, respectively; $P=.023$). A trend, not reaching statistical significance, was noted in which such women were more likely to have normal levator ani muscles or minor levator defects than major defects as assessed by MRI (35.7% vs 33.3% vs 18.1%, respectively; $P=.064$).

Women reporting having to strain hard to complete a bowel movement on most occasions or every occasion were more likely to have “good” or “fair” pelvic floor strength by palpation (29.7% vs 15.8%, respectively; $P=.041$) and to have normal levator ani muscles or minor levator ani defects than major levator ani defects (34.9% vs 37.5% vs 12.1%, respectively; $P=.002$) as determined by MRI.

Comment

Approximately one third of women with prolapse will have symptoms of incontinence of flatus and/or DD. The proportion of women with prolapse who have these symptoms is at least 3 times higher than that observed among controls matched for age, race, and hysterectomy status.

The prevalence of AI and DD in this study is generally consistent with that found in previous work. The proportion of women with incontinence of stool in our study is lower than that reported by other investigators. Differences in definitions of fecal incontinence and patient selection may account for this discrepancy.

The importance of pelvic floor muscle integrity is illustrated by the association of DD with the measurement of perineal body length. It has been suggested that genital hiatus, perineal body length, or the sum of these 2 measures could be a surrogate measure for perineal descent, which requires the relatively invasive radiologic study of defecography. Our findings indicate such a relationship between symptoms and the measurement of the perineal body, but not of the genital hiatus. This latter relationship will need to be confirmed by studies assessing the discriminative properties of perineal body length and perineal descent for defecatory disorders.

Women with prolapse and who report DD are more likely to have a small prolapse, good or fair muscle strength by palpation, and normal levator ani muscles by MRI. We suspect that this apparent paradox may be explained by the reasons that patients with prolapse seek care. Women with a smaller prolapse may be more likely to present for care because of symptoms such as pushing on the vagina or rectum to complete a bowel movement, whereas those with a large prolapse may be more likely to have greater discomfort related to the vaginal bulge.

This study's design is important to consider when assessing its limitations. With only 34 patients reporting incontinence of flatus and 29 reporting the need to push on the vagina or around the rectum to complete a bowel movement, it is not possible to develop multivariable models to predict the outcomes of interest. Although the number reporting AI or DD is small, the findings are strengthened by similar distributions of age, race, hysterectomy status, and BMI among women with prolapse and controls.

The inability to control for parity is a limitation and a repercussion of the selection criteria for cases and controls. By our definition, controls had to have vaginal support at least 1 cm above the hymen and cases had to have prolapse at least 1 cm beyond the hymen. This strategy was chosen because the primary aim of the parent study was to analyze women with and without prolapse for evidence of soft tissue injury. It avoided possible conflict in assigning case or control status but had the disadvantage of making it impossible to recruit controls of similar parity.

Women with prolapse are at increased risk for symptoms of AI and DD when compared with women having relatively normal support and of similar age, BMI, race, and hysterectomy status. The fact that women with prolapse who report DD have a larger perineal body is evidence that anatomic findings of pelvic floor relaxation are associated with dysfunction. However, our interpretation of this finding must be tempered by the paradoxical associations of symptoms with other relatively normal anatomic and physiologic findings. Future studies correlating health behaviors and radiographic, neurologic, and pathologic findings with symptoms will be helpful in elucidating the presentation and pathophysiology of anal incontinence and defecation disorders.

CLINICAL IMPLICATIONS

- Anal incontinence and difficult defecation (DD) are common among women with prolapse.
- More than one third of all women with prolapse report symptoms of anal incontinence, DD, or both.

Acknowledgements

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Table 1

Symptoms of anal incontinence and difficult defecation among cases with prolapse and controls

Anal Incontinence				
<i>On most days or every day, do you lose:</i>	Prolapse	Controls	OR (CI)	P value
<i>Gas from the rectum beyond your control?</i>	23.0% (34/148)	8.3% (11/132)	3.3 (1.6 – 6.8)	0.001
<i>Stool beyond your control if your stool is loose or liquid?</i>	4.7% (7/149)	0% (0/133)	*	0.011
<i>Stool beyond your control other than during an episode of diarrhea?</i>	3.5% (5/144)	0% (0/132)	*	0.031
Difficult defecation				
<i>With most or every bowel movement, do you:</i>	Prolapse	Controls	OR (CI)	P value
<i>Have to push on the vagina or around the rectum to have a complete bowel movement?</i>	19.5% (29/149)	4.4% (6/135)	5.2 (2.1-12.9)	<0.001
<i>Need to strain hard?</i>	22.5% (34/151)	1.5% (2/134)	19.2 (4.5 – 81.5)	<0.001
<i>Feel that you have not completely emptied your bowels?</i>	25.3% (38/150)	4.4% (6/135)	7.2 (3.0-17.9)	<0.001

* Because controls did not report these symptoms, odds ratios and confidence intervals were not calculated.

Table II

Anal Incontinence:			Difficult Defecation			
Loss of “gas from the rectum beyond your control...”			“Do you have to push on vagina or around rectum to complete a bowel movement...”			
Examination	“never” or on “occasion” n=114	“most” or “every” day n=34	P value	“never” or on “occasion” n=119	“most” or “every” time n=29	P value
Age (years)	56.2 ± 13.2	57.0 ± 11.7	0.711	57.0 ± 12.6	53.3 ± 14.0	0.185
Vaginal Parity (mean ± SD)	2.5 ± 1.5	3.3 ± 2.3	0.012	2.9 ± 1.8	3.3 ± 1.9	0.241
Race (% white)	93.9%	93.9%	0.984	93.2%	96.6%	0.515
Uterus in situ	80.7%	76.5%	0.590	79.8%	79.3%	0.950
Body Mass Index (kg/m2)	26.1 ± 4.8	27.4 ± 5.0	0.115	25.8 ± 4.5	27.7 ± 5.8	0.071
POP-Q (cm):						
Aa	0.7 ± 1.3	0.6 ± 1.4	0.801	0.7 ± 1.4	0.4 ± 1.3	0.254
Ba	2.0 ± 2.0	1.8 ± 2.3	0.716	2.1 ± 1.9	1.4 ± 2.4	0.129
C	-1.4 ± 4.0	-2.2 ± 4.1	0.313	-1.3 ± 4.2	-2.5 ± 3.6	0.185
Bp	-0.2 ± 2.3	0.3 ± 2.4	0.266	-0.2 ± 2.4	0.2 ± 2.4	0.371
Ap	-1.1 ± 1.5	-0.8 ± 1.6	0.084	-0.7 ± 1.6	-0.4 ± 1.6	0.302
Genital Hiatus						
Resting	4.5 ± 1.3	5.0 ± 1.5	0.119	4.7 ± 1.3	4.9 ± 1.8	0.472
Straining	5.4 ± 1.6	5.8 ± 1.5	0.169	5.5 ± 1.4	5.6 ± 1.9	0.766
Perineal Body						
Resting	3.3 ± 1.0	3.1 ± 1.0	0.548	3.2 ± 0.9	3.5 ± 0.9	0.134
Straining	3.3 ± 1.0	3.3 ± 1.0	0.998	3.2 ± 1.0*	3.7 ± 0.9*	0.023
Vaginal Closure Force						
Resting (N)	3.6 ± 1.1*	4.2 ± 1.2	0.012	3.7 ± 1.1	4.0 ± 1.1	0.121
Augmentation (N)	1.8 ± 1.4	1.6 ± 0.9	0.621	1.7 ± 1.2	2.1 ± 1.9	0.183
Leading Edge						
Anterior	72 (63.2%)	20 (21.7%)	0.323	75 (81.5%)	17 (18.5%)	0.062
Apical	24 (82.8%)	5 (17.2%)		27 (90.0%)	3 (10.3%)	
Posterior	17 (65.4%)	9 (34.6%)		17 (65.4%)	9 (31.0%)	
Distance Beyond Hymen						
= 1 cm	35 (76.1%)	11 (23.9%)	0.975	31 (68.9%)	14 (31.1%)	0.062
> 1 & <= 3cm	49 (77.8%)	14 (22.2%)		54 (84.4%)	10 (15.6%)	
> 3 cm	29 (76.3%)	9 (23.7%)		34 (87.2%)	5 (12.8%)	
Pelvic Floor Strength by						
Palpation			0.798			0.052
Good or Fair	56 (77.8%)	16 (22.2%)		54 (74.0%)	19 (26.0%)	
Poor or Absent	57 (76.0%)	18 (24.0%)		65 (86.7%)	10 (13.3%)	
Levator Ani Defect Status						
No defect	32 (80.0%)	8 (20.0%)	0.189	29 (70.7%)	12 (29.3%)	0.146
Minor	15 (62.5%)	9 (37.5%)		19 (79.2%)	5 (20.8%)	
Major	66 (79.5%)	17 (20.5%)		71 (85.5%)	12 (14.5%)	

Anal Incontinence:		Difficult Defecation			
Loss of "gas from the rectum beyond your control..."		"Do you have to push on vagina or around rectum to complete a bowel movement..."			
Examination	"never" or on "occasion," n=114	"most" or "every" day n=34	P value	"never" or on "occasion," n=119	"most" or "every" time n=29
Standing Cough Stress Test			0.019		
Positive	17 (60.7%)	11 (39.3%)		22 (75.9%)	7 (24.1%)
Negative	96 (81.5%)	22 (18.5%)		97 (82.2%)	21 (17.8%)
					0.436