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# PELVIC ORGAN PROLAPSE IN WOMEN: IS THERE A RELATIONSHIP WITH CONSTIPATION AND DIETARY FIBER INTAKE?

## Hypothesis / aims of study

To determine if there is an association between pelvic organ prolapse, constipation and dietary fiber intake. Our hypothesis is that women with pelvic organ prolapse are more likely to have constipation than controls and that this constipation is related to their dietary fiber intake.

### Study design, materials and methods

Following approval by Institutional Review Board, 60 consecutive women with pelvic organ prolapse (grade 2 or higher) were compared with 30 control women without pelvic organ prolapse. Controls were recruited from women reporting for annual gynaecological examinations. All women underwent standardized examination system for the diagnosis and stage of prolapse. All women completed three self-administered validated questionnaires to assess urinary incontinence (Questionnaire for the Diagnosis of Urinary Incontinence), constipation (Patient Assessment of Constipation Symptom Questionnaire or PAC-SYM) and dietary fiber intake (Diet History Questionnaire or DHQ). The one-hour DHQ consists of 124 food items and includes both portion size and dietary supplement questions. DietCalc software (National Cancer Institute) was used to calculate dietary fiber in grams. Constipation was defined as a PAC-SYM score of 0.25 or greater. The PAC-SYM scores (0-4) and the daily dietary fiber intake in grams of the two groups were compared using the two-sample t-test for independent samples. Univariate and multivariate analysis were performed to determine risk factors for pelvic organ prolapse.

#### <u>Results</u>

There was no significant difference in the mean age (54  $\pm$  1.3 vs. 52  $\pm$  9.4 years), parity and estrogen status of cases and controls.

Women with pelvic organ prolapse were significantly more likely to have higher constipation (1.86  $\pm$  0.7) scores than controls (0.28  $\pm$  0.65, p <0.01). The risk for constipation was also greater in women with prolapse than controls (Table 1). Overall 23 women with prolapse (38%) reported stress urinary incontinence. The risk for constipation was higher in women with both prolapse and stress urinary incontinence than controls.

Table 1: Risk for constipation in women with prolapse and stress urinary incontinence: Univariate analysis

	Constipation	No Constipation	Odds Ratio (OR), 95% Confidence Interval (CI)	P value
Controls (n=30)	11	19		
Pelvic Organ Prolpase (n=60)	42	18	4.03 (1.5,11.4)	.002
Stress incontinence and Prolapse (n=23)	18	5	6.2 (1.6,26.3)	.002

Mean dietary fiber intake was similar in women with prolapse and controls (Table 2). Mean soluble fiber intake was significantly greater and mean insoluble fiber intake significantly lower in women with prolapse as compared to controls (Table 2). Women with prolapse were more likely to be on fiber supplements (containing soluble fiber) than controls (OR 2.86, 95%Cl 0.9, 9.1, p<0.05).

	Total fiber	Soluble fiber	Insoluble fiber
Controls (n=60)	$12.1 \pm 11.6$	6.7 ± 11.3	5.8 ± 10.9
Pelvic organ prolapse (n=30)	$14.5\pm8.5$	12.6 ± 11.5 <sup>+</sup>	2.4 ± 6.4 <sup>+</sup>
Stress incontinence and	$13.9\pm11.9$	11.1 ± 9.2 <sup>+</sup>	2.7 ± 7.4 <sup>+</sup>
prolapse (n=21)			

 $^+$  P < .01 as compared to controls

On step wise regression analysis, women with pelvic organ prolapse had an increased risk for constipation compared with controls even after controlling for age and total dietary fiber intake (Table 3). The risk for constipation was lower when insoluble fiber was introduced in the model but remained significant.

Table 3: Risk for constipation in women with prolapse and stress incontinence: Multivariate analysis

	Pelvic Organ	Stress
	prolapse	incontinence and
		prolapse
Age only	4.01 (1.4,11.6),	6.2 (1.6,26.7),
	p=0.003	p=.003
Age and total	3.9 (1.4,11.9),	5.9 (1.4,26.8),
fiber	p=0.006	p=.005
Age and	2.9 (1.1,13.5),	4.8 (1.1,27.2),
insoluble fiber	p=.02	p=.01

#### Interpretation of results

On univariate analysis, an increased risk for constipation is seen in women with pelvic organ prolapse as compared to controls. A moderate dose-response relationship is seen with an even higher risk for constipation in women with both prolapse and stress incontinence. Mean insoluble fiber intake was lower in women with prolapse than in controls. To test the hypothesis that lack of insoluble fiber intake was responsible for the increased risk for constipation, we performed step wise regression analysis. The risk for constipation was almost unchanged when age and total dietary fiber intake were introduced in the model, suggesting that these variables had relatively little impact on the risk in our population. The risk was reduced but remained significantly high when insoluble fiber was introduced into the model suggesting that lack of insoluble fiber partly explains the increased risk for constipation in women with prolapse.

## Concluding message

Women with pelvic organ prolapse are at a higher risk for constipation than controls. There is an even higher risk for constipation in women with both pelvic organ prolapse and stress incontinence. The increased risk for constipation is at least partly related to lack of dietary insoluble fiber intake.