Exacerbation of Symptom Severity of Pelvic Floor Disorders in Women Who Report a History of Sexual Abuse

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Objective: To examine the effect of previous sexual abuse or assault (SAA) on symptom severity, quality of life, and physiologic measures in women with fecal incontinence or constipation.

Design: A cross-sectional study of a prospectively maintained clinical database.

Setting: A tertiary referral center for evaluation and physiologic testing for pelvic floor disorders.

Patients: Women with fecal incontinence or constipation examined during a 6-year period.

Main Outcome Measures: Symptom severity and quality of life were measured with the Fecal Incontinence Severity Index (FISI), Fecal Incontinence Quality of Life Scale (FIQL), Constipation Severity Instrument (CSI), Constipation-Related Quality of Life measure (CR-QOL), and 12-Item Short Form Health Survey (SF-12). Physiologic variables were ascertained with anorectal manometry, electromyography, and endoanal ultrasonography.

Results: Of the 1781 women included, 213 (12.0%) reported SAA. These women were more likely to be white, to report a psychiatric illness, and to have a prior hysterectomy or episiotomy. On bivariate analysis, women with prior SAA had increased symptom severity on the FISI ($P = .002$) and CSI ($P < .001$) and diminished quality of life on the FIQL ($P < .001$), CR-QOL ($P = .009$), and SF-12 ($P = .002$ to $P = .004$). Physiologic variables did not differ significantly between patients with and without prior SAA.

Conclusions: A history of SAA significantly alters disease perception in fecal incontinence and constipation, but the disorders do not result from increased physiologic alterations. We must elicit a history of SAA in these patients, because the history may play a role in the discrepancy between symptom reporting and objective measurements and may modify treatment recommendations.
We conducted a cross-sectional study of a prospectively maintained database of patient information from the Center for Pelvic Physiology at the University of California, San Francisco. This study was approved by the institutional review board at the university.

PATIENTS

We included all women presenting to our center with a primary complaint of fecal incontinence and/or constipation from November 1, 2004, through February 28, 2011. We excluded patients who were male (n = 546) or transgender (n = 4) or who declined to answer questions regarding history of sexual assault (n = 115) (Figure). Baseline characteristics included demographic data and medical, surgical, obstetric, and social histories. Sexual abuse or assault was defined as an affirmative response to any of the following questions: (1) Have you ever been sexually assaulted or abused? (2) If yes, did it involve vaginal penetration? and (3) If yes, did it involve rectal penetration?

SYMPTOM AND QUALITY-OF-LIFE INSTRUMENTS

Disease-specific symptoms and quality of life were ascertained with questionnaires previously validated in similar disease-specific populations. The Fecal Incontinence Severity Index (FISI) quantifies the severity of fecal incontinence symptoms based on the frequency of incontinence with gas, mucus, liquid, and/or solid stool. Patient responses are weighted and totaled with higher values reflecting worse symptoms (range, 0-61). The Fecal Incontinence Quality of Life Scale (FIQL) is a 29-question survey that establishes life quality in the following 4 areas (subscale range, 1-5): lifestyle, coping and behavior, depression and self-perception, and embarrassment. Lower values reflect diminished quality. For our study, a total FIQL score was calculated by adding the subscales together. The Constipation Severity Index (CSI) consists of 16 questions that ascertain severity by means of a total score (range, 0-73) and the following subtypes of constipation: obstructive defecation (range, 0-28), colonic inertia (0-29), or pain (0-14). Higher values reflect worse symptoms. The Constipation-Related Quality of Life instrument (CR-QOL) is a 29-question survey that quantifies quality-of-life impairment due to constipation with a focus on eating (range, 3-15), bathroom use (4-20), social impairment (5-25), and distress (6-30). Higher values reflect worse symptoms. The 12-Item Short Form Health Survey (SF-12) quantifies general health. Patient responses are weighted and summed to provide physical and mental component summary scores with higher scores reflecting improved overall health.

PATIENT ASSESSMENT

Study participants were asked to fill out a disease-specific survey only if they identified that particular disease as their chief complaint. These surveys were introduced at different points during the study. Of the 1781 study participants, 1591 (89.3%) completed the FISI and constituted the group with fecal incontinence. The FIQL was subsequently introduced, and 1172 (73.7% with fecal incontinence) completed it. The CSI, introduced in 2008, was provided to 646 participants, of whom 464 (71.8%) completed it and constituted the group with constipation. The CR-QOL was introduced subsequently, and 374 (80.6% with constipation) completed it. A total of 274 participants identified both diseases as main complaints. The SF-12 was introduced in 2008, and all participants were asked to complete it.

All patients underwent anorectal physiologic examinations using standard procedures described for fecal incontinence and constipation. These procedures included resting and squeeze pressures, first rectal sensation, and maximum tolerated volume. For participants with fecal incontinence, assessment included pudendal-nerve terminal motor latency and endoanal ultrasonography. For those with constipation, assessment included a balloon expulsion test and a sponge test to determine puborectalis muscle function.

STATISTICAL ANALYSIS

Most variables evaluated were distributed nonnormally. Data for these variables were analyzed using χ² tests for categorical variables and Mann-Whitney tests for continuous variables. For
RESULTS

A total of 1781 women with fecal incontinence, constipation, or both were included in this study, of whom 214 (12.0%) reported previous SAA (Figure). Of this group, abuse was characterized as vaginal penetration in 75 cases (35.0%), anal penetration in 7 (3.3%), and both in 32 (15.0%). The remaining 100 women (46.7%) reported previous SAA but declined to describe it further.

BASELINE CHARACTERISTICS

Women with and without a history of SAA were similar in age, number of pregnancies, and vaginal and cesarean section deliveries (Table 1). Both groups reported similar rates of anorectal operations and surgical repairs for cystocele, rectocele, or urinary incontinence. They differed, however, in several ways. More women with previous SAA were white (70.6% vs 58.6%; P < .001) and were diagnosed as having a psychiatric illness (69.7% vs 38.1%; P < .001). They were more likely to have had an episiotomy (57.5% vs 43.7%; P < .001), a hysterectomy (44.9% vs 37.2%; P = .04), or a repair of vaginal prolapse (10.4% vs 6.1%; P = .03) than nonabused women. Women with prior SAA smoked tobacco more frequently (P < .001). Women who declined to answer questions about SAA were younger than women in the other groups (mean [SD] age, 54.7 [11.5] years); 46.7% reported a psychiatric illness and 14.1% used tobacco.

ANALYSIS OF FECAL INCONTINENCE

Of the 1781 women included, 1591 (89.3%) reported a chief complaint of fecal incontinence and completed the FISI. Of these, 1172 (73.7%) completed the FIQL and 237 (14.9%) completed the SF-12. Women with a history of SAA reported significantly worse symptoms (mean FISI score, 33.2 vs 29.9 in women without SAA; P = .002) and impaired quality of life (mean total FIQL score, 7.4 vs 8.4 in women without SAA; P < .001) compared with women without SAA (Table 2). Scores for each FIQL subscale reflected inferior quality of life due to fecal incontinence in women with prior SAA. Furthermore, both components of the SF-12 showed decreasing function in women with fecal incontinence and a history of SAA (Table 2). Mean resting pressures were higher in patients with a history of SAA (42.2 vs 38.5 mm Hg; P = .004). Squeeze pressure, overall squeeze, first sensation, maximum volume, and the percentage with a defect in the internal or external sphincter did not differ significantly between the 2 groups. The par-
participants with fecal incontinence who dismissed questions about SAA reported symptoms similarly to those without previous SAA.

**ADJUSTED ANALYSIS OF TOTAL FIQL AND PATIENT-WEIGHTED FISI**

The mean patient-weighted FISI (symptom severity) score was associated with a 2.4-point increase (95% CI, 0.1-4.7; \( P = .04 \)) in participants with a history of SAA after controlling for age, psychiatric illness, episiotomy, and hysterectomy. The mean total FIQL (quality of life) score was associated with a 0.81-point decrease (95% CI, −1.45 to 0.83; \( P = .29 \)) in women with SAA after controlling for the same confounding factors.

**ANALYSIS OF CONSTIPATION**

Of the 689 women who provided the constipation-specific surveys, 464 (67.3%) reported a chief complaint of constipation and completed the CSI; 374 (80.6%) completed the CR-QOL and 268 (57.8%) completed the SF-12. Women with a history of SAA reported worse constipation-related symptoms and compromised quality of life, reflected by a higher mean total CSI score of 42.1 vs 36.0 for women with no history of SAA (\( P < .001 \)) \( P = .001 \)) in women with a history of SAA after controlling for the confounding factors.

**ADJUSTED ANALYSIS OF TOTAL CSI AND CR-QOL SCORES**

A history of SAA remained a vital factor in symptom severity (CSI) after controlling for age, race, psychiatric illness, and episiotomy, with a mean 3.7-point increase (95% CI, 0.2-7.1; \( P = .04 \)) in women with a history of SAA. The total CR-QOL score was associated with a 3.5-point increase (95% CI, −1.1 to 8.3; \( P = .13 \)) in women with a history of SAA but was not statistically significant after controlling for the confounding factors.

**COMMENT**

In this study, we hypothesized that among women seeking specialty consultation for the management of fecal...
A history of SAA has been shown in several studies to affect symptoms of pelvic floor disorders. Women with a history of SAA were found to have significantly more anorectal pathophysiology. In our study, patients with prior SAA had higher mean resting and squeeze pressures compared to their nonabused counterparts. These differences were statistically significant, indicating a more pronounced pelvic floor dysfunction in women with a history of SAA. However, there was no significant difference in balloon expulsion and sponge test results between the two groups, suggesting that the effect of SAA on pelvic floor function is not solely related to muscle strength but may involve other factors such as sensory perception.

Obstetric injury is a commonly cited cause of fecal incontinence in women, and in our study, this history did not differ between women with and without prior SAA. The history of gynecological procedures, including hysterectomy, episiotomy, and repairs for vaginal prolapse, was increased in women with prior SAA, but this finding did not correlate with differentially abnormal anorectal pathophysiology. In fact, mean anal resting pressures were higher in patients with prior SAA despite more frequent surgery for pelvic floor disorders. This suggests that the increased incontinence and/or constipation, prior SAA would influence disproportionately a patient's presentation and not necessarily correlate with the severity of the underlying anorectal physiology. We found that 12.0% reported a history of SAA and that this history was associated with exacerbated disease perception, as measured by symptom severity and quality-of-life instruments, and that the exacerbated experience of disease could not be explained by comparably more severe abnormalities in anorectal physiology or anatomy.

A history of SAA has been shown in several studies to portend aggravated disease presentation. A history of SAA was found in 23% of 185 women undergoing evaluation at a tertiary center for pelvic floor complaints in the Netherlands, and these patients had significantly more complaints concerning micturition, defecation, and sexual function than did their nonabused counterparts. A population-based study of 730 German women found a 13.5% prevalence of completed rape. Women who were sexually abused complained more often of irregular menstrual cycles, urinary tract infections, and pelvic pain. A meta-analysis of 23 studies consisting of 4640 total patients reported significant associations between functional gastrointestinal tract disorders, nonspecific chronic pain, and chronic pelvic pain and a history of SAA. These and other studies clearly demonstrate that a history of SAA is relevant to patients with pelvic floor and gastrointestinal tract complaints. However, we remain unclear whether the exacerbated disease presentation in women with previous SAA is due to altered pelvic floor physiology and anatomy. This particular question was addressed in a study of 119 Canadian women diagnosed with interstitial cystitis. Those with prior SAA presented with distinctly more pain but had fewer objective voiding problems, including frequency and nocturia. These findings led the investigators to suggest the augmented pain in women with previous SAA and interstitial cystitis may be due to central nervous system sensitization rather than pelvic pathology. Similarly, in our study of women seeking specialty care for fecal incontinence and constipation, those with prior SAA were more likely to describe severe symptoms and reduced quality of life due to their disease. Further, the objective measures for fecal incontinence and constipation did not distinguish women with or without prior SAA. Sexual abuse persisted as a risk factor for exacerbated disease perception after controlling for potential confounders, including psychiatric illness.

Table 3. Constipation Disease–Related Survey Scores and Physiologic Testing Results by History of SAA

<table>
<thead>
<tr>
<th>No History of SAA (n = 382)</th>
<th>History of SAA (n = 82)</th>
<th>P Valueb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom severity, quality of life, and general health scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI total</td>
<td>36.0 (15.2)</td>
<td>42.1 (14.3)</td>
</tr>
<tr>
<td>CSI obstructive defecation subscale</td>
<td>18.8 (6.4)</td>
<td>20.7 (6.3)</td>
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<tr>
<td>CSI colonic inertia subscale</td>
<td>12.9 (7.7)</td>
<td>15.3 (7.2)</td>
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<tr>
<td>CSI pain subscale</td>
<td>5.6 (4.3)</td>
<td>6.6 (4.5)</td>
</tr>
<tr>
<td>CR-QOL total</td>
<td>50.9 (17.7)</td>
<td>57.6 (18.7)</td>
</tr>
<tr>
<td>CR-QOL eating subscale</td>
<td>8.6 (4.1)</td>
<td>9.9 (4.3)</td>
</tr>
<tr>
<td>CR-QOL bathroom subscale</td>
<td>10.9 (5.5)</td>
<td>12.9 (5.2)</td>
</tr>
<tr>
<td>CR-QOL social impairment subscale</td>
<td>9.5 (5.8)</td>
<td>12.1 (6.7)</td>
</tr>
<tr>
<td>CR-QOL distress subscale</td>
<td>22.8 (7.0)</td>
<td>24.5 (4.9)</td>
</tr>
<tr>
<td>SF-12 physical component summaryc</td>
<td>42.4 (11.7)</td>
<td>37.6 (10.2)</td>
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Anorectal physiologic findings

<table>
<thead>
<tr>
<th>No History of SAA (n = 382)</th>
<th>History of SAA (n = 82)</th>
<th>P Valueb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting pressure, mm Hg</td>
<td>49.1 (22.7)</td>
<td>44.7 (20.9)</td>
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<tr>
<td>Squeeze pressure, mm Hg</td>
<td>45.3 (22.9)</td>
<td>47.8 (29.1)</td>
</tr>
<tr>
<td>Overall squeeze, mm Hg</td>
<td>87.8 (33.9)</td>
<td>87.8 (38.8)</td>
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<tr>
<td>First sensation, mL</td>
<td>53.4 (31.4)</td>
<td>50.7 (24.1)</td>
</tr>
<tr>
<td>Maximum volume, mL</td>
<td>146.8 (61.6)</td>
<td>137.1 (52.7)</td>
</tr>
<tr>
<td>Balloon expelled, %</td>
<td>14.1</td>
<td>17.1</td>
</tr>
<tr>
<td>Sponge test, %</td>
<td>79.1</td>
<td>73.2</td>
</tr>
<tr>
<td>Paradoxical</td>
<td>11.9</td>
<td>16.1</td>
</tr>
<tr>
<td>Equivocal</td>
<td>9.0</td>
<td>10.7</td>
</tr>
<tr>
<td>Normal</td>
<td>73.2</td>
<td>50.7</td>
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</table>

Abbreviations: CR-QOL, Constipation-Related Quality of Life measure; CSI, Constipation Severity Instrument; SAA, sexual abuse or assault; SF-12, 12-Item Short Form Health Survey.

a Data were missing in 90 subjects for CR-QOL; 196 for SF-12; 8 for resting, squeeze, and overall squeeze; 21 for first sensation; 32 for maximum volume; 47 for balloon expulsion test; and 130 for sponge test. Unless otherwise indicated, data are expressed as mean (SD).

b Derived from χ² or Mann-Whitney test unless otherwise indicated.

c Indicates normally distributed and derived from the 2-tailed t test.
all squeeze, first rectal sensation, maximum tolerable rectal volume, pudendal-nerve terminal motor latency, and percentage with sphincter defects. The FISI (symptom severity) and FIQL (quality of life) scores, however, demonstrated that women with a history of SAA face greater challenges with fecal incontinence than do women without such a history. When we controlled for age, race, psychiatric illness, hysterectomy, and episoitomy, the symptom severity and quality-of-life scores reflected aggravated disease presentation in women with a history of SAA.

In patients with constipation, a primary objective in the specialty setting is to determine the underlying pathophysiological feature, whether dyssynergic defeation, slow colonic transit, irritable bowel syndrome, functional constipation, or a combination of these alterations. In our study, women with previous SAA reported more constipation symptoms and greater life disruption than did women without a history of SAA. However, mean scores on the CSI pain subscale (which correlates to irritable bowel syndrome–type constipation) and CR-QOL distress subscale did not differ between the 2 groups of women. This finding suggests that the effect of SAA on patients’ complaints of constipation is not all encompassing. Like the findings in patients with fecal incontinence, the exacerbated complaints owing to constipation in women with previous SAA could not be explained by aberrant anorectal dysfunction. In fact, on average, constipated women with prior SAA had lower resting pressures, higher squeeze pressures, decreased maximum volumes, and higher frequency of normal puborectalis function on sponge test results. After we controlled for age, race, psychiatric illness, and episiotomy, CSI (symptom severity) scores were magnified in women with previous SAA. The statistical significance of CR-QOL scores diminished after this adjustment.

The strength of our findings, which rest on a large sample size and a similar outcome despite 2 different types of PFD, provide important insights for colorectal surgeons who evaluate and treat patients with fecal incontinence or constipation. However, our study has several limitations. First, the severity and chronicity of SAA is not accounted for; neither is a description of the time from disease presentation in women with a history of SAA. This total is slightly smaller than the 214 who reported such abuse. Second, the self-reported nature of SAA to presentation. Second, the self-reported nature of SAA is a potential limitation. Third, 115 of the 1896 participants (6.1%) declined to answer questions regarding a history of SAA. This total is slightly smaller than the 214 who reported such abuse. Fourth, although every effort was made to identify confounding factors, including creation of a multivariate model, we might not have adjusted for unidentified factors. Finally, because we evaluated PFD in patients who were referred to colorectal surgeons specializing in pelvic floor physiology, our conclusions should not be generalized to patients in a wider population.

Although our findings indicate that prior SAA is relevant to the presentation of fecal incontinence and constipation, we did not evaluate therapeutic results. Similar success with biofeedback sessions in abused and nonabused patients has been reported; however, the definition of abuse in that study was broad and may not be generalizable to our patient population. A study of the effect of SAA on surgical outcomes of total colectomy with ileorectal anastomosis for treatment of slow-transit constipation found that despite being satisfied with the operation, the sexually abused group had an increased number of previous operations and functional diagnoses ($P < .001$), and 88% continued to seek medical care for abdominal complaints after colectomy ($P = .005$).

We conclude that a history of SAA significantly alters disease perception in women with fecal incontinence or constipation, but that this perception is not the result of increased physiologic alterations. We believe physicians must elicit a history of SAA in these patients because it may play a role in the discrepancy between symptom reporting and objective measurements and ultimately may modify treatment recommendations.

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Author Contributions: Study concept and design: Imhoff and Varma. Acquisition of data: Imhoff, Liwanag, and Varma. Analysis and interpretation of data: Imhoff and Varma. Drafting of the manuscript: Imhoff. Critical revision of the manuscript for important intellectual content: Imhoff, Liwanag, and Varma. Statistical analysis: Imhoff. Administrative, technical, and material support: Imhoff and Liwanag. Study supervision: Varma.

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REFERENCES


