Published in final edited form as:

Dis Colon Rectum. 2019 June ; 62(6): 733–738. doi:10.1097/DCR.0000000000001353.

Fecal Incontinence Symptoms and Impact in Older Versus Younger Women Seeking Care

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Abstract

BACKGROUND: The differential impact of aging on fecal incontinence symptom severity and condition-specific quality of life remains unclear.

OBJECTIVE: To characterize differences in symptom distress, quality of life, and anorectal physiology assessments in older versus younger women with fecal incontinence.

DESIGN: A cross-sectional study.

SETTINGS: This study was conducted at a tertiary genitorectal disorder clinic.

PATIENTS: Women presenting for fecal incontinence evaluation from 2003 to 2016 were classified as older or younger based on age ≥ 65 or < 65 years, respectively.

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Disclosures:

I Meyer, CT Blanchard, AD Markland, EG Gibson: No disclosures

HE Richter: Pelvalon Consultant and grant support

Conflict of interest: None

The abstract was an Oral Poster Presentation at the PFD Week 2017 (the American Urogynecologic Society Annual Scientific Meeting) in Providence, RI, October 3-7, 2017

MAIN OUTCOME MEASURES: The main outcomes were symptom specific quality of life and distress measured by validated questionnaires (the Modified Manchester Health Questionnaires containing the Fecal Incontinence Severity Index); anorectal physiology and anatomy was assessed by manometry and endoanal ultrasound.

RESULTS: Of 879 subjects, 286 and 593 were classified as older and younger (mean ages 71.4 ± 5.3 and 51.3 ± 10.5). Solid stool leakage was more frequent in older women (83.2% versus 76.7%, $p=0.03$) whereas liquid stool leakage (83.2% versus 82.8%, $p=0.88$) and fecal urgency (76.9% versus 78.8%, $p=0.54$) did not differ between groups. Mean symptom severity scores were similar between groups (28.0 ± 11.9 and 27.6 ± 13.5 , $p=0.69$), however, there was greater negative impact on quality of life among younger women (46.3 ± 22.0 versus 51.8 ± 21.8 , $p<0.01$). Multivariable linear regression controlling for pertinent covariates revealed younger age as an independent predictor for worse condition-specific QOL scores ($p<0.01$). Squeeze pressures were similar between groups, whereas younger women had greater resting pressures, and higher rates of sphincter defects (external 7.7% versus 20.2%, internal 12.2% versus 26.8%, both $p<0.01$).

LIMITATIONS: Lack of patients' obstetric history and the duration of their incontinence symptoms.

CONCLUSIONS: Characteristics differ between older and younger women seeking care for fecal incontinence. The differential impact and age-related phenotypes may provide useful information for patient counseling and developing management algorithms for women with fecal incontinence.

Keywords

Accidental bowel leakage; Aging; Fecal incontinence; Quality of life; Older women

INTRODUCTION

Fecal incontinence (FI), the complaint of involuntary loss of liquid or solid stool, is a highly debilitating condition which negatively impacts women's health and quality of life (QOL). The reported prevalence rates vary based on the population and definition used in the study, ranging from 21% in the community-dwelling women to 40% in the nursing home population.¹⁻⁷ FI is more common among older women and contributes to increased mortality in older adults at risk for nursing home placement.⁸ As the aging population increases, healthcare burden will become substantial.

Causes of FI are often multifactorial. The continence mechanism is controlled by a complex system involving innervation systems, both central and peripheral, along with intact anatomy and function of the anal sphincter complex, gastrointestinal motility, stool consistency/volume and rectal compliance. Systemic conditions as well as physical and functional status such as cognitive impairment and decreased mobility all play a role in maintaining continence.^{9,10} In addition, aging associated physiologic changes including increased medical comorbidities, can influence the etiology of FI. The current literature suggests that the etiology of FI often differ between older versus younger women.⁹⁻¹¹ Yet, there is a paucity of data on the differential impact of aging on symptom severity and condition-related QOL among women suffering from FI. Although advanced age is a recognized risk factor, FI should not be considered an inevitable consequence or "normal" part of aging. The

aim of the current study was to characterize differences in FI symptom distress, condition-related QOL, and anorectal physiology testing in older versus younger women with FI symptoms presenting for care. We hypothesized that characteristics and impact of FI would differ between older and younger women seeking care.

MATERIALS AND METHODS

Women presenting for initial evaluation of FI to the Genitorectal Disorders Clinic from 2003 to 2016 were eligible for this cross-sectional study. Institutional Review Board (IRB) approval exists for a de-identified comprehensive database. At the time of initial evaluation and anorectal function testing, participants provided written informed consent for baseline evaluation data collection and entry into this database. Baseline demographic data were collected including age, race, obesity defined by body mass index (BMI, greater than 30 kilograms/meter²), parity, medical and surgical history (diabetes, prior anal sphincter surgery including obstetric anal sphincter injury [OASI] repair, hysterectomy, cholecystectomy), and smoking status. The presence of urinary incontinence (UI) was defined as having urinary leakage of at least a few times a month using the Sandvik Severity Index.¹²

Condition-specific QOL was examined using the Modified Manchester Health Questionnaire (MMHQ) which includes 8 domains (overall incontinence impact, role limitations, physical limitations, social limitations, personal relationships, emotions, sleep/energy, sexual activity, and lifestyle adaptation).¹³ The MMHQ is scaled from 0 to 100, for total and subscale scores, where higher scores represent a negative impact on condition-specific QOL thus worse symptom bother. FI symptom severity was examined using the FI Severity Index (FISI, range 0-61), which is a part of the MMHQ. The FISI assesses 4 types of bowel leakage (gas, mucus, liquid and solid stool) and 6 categories of frequency and incontinence episodes (never, 1-3 times a month, once a week, 2 or more times a week, once a day, 2 or more times a day), with higher scores indicating worse FI severity.¹³ The Short Form-12 (SF-12) consisting of mental and physical component summary scores (MCS and PCS, range 0-100) was used to evaluate a generic health-related QOL (higher scores indicating a positive impact).¹⁴

Participants underwent objective anorectal function and anatomy testing by anorectal manometry and endoanal ultrasound, respectively. Anorectal manometry was completed using a water-perfused disposable catheter system (Medtronic, Inc, Minneapolis, MN). Resting and maximum squeeze pressures were recorded at 1centimeter (cm) intervals starting at 5 centimeters proximal to the anal verge. All pressures were measured three times at each of the 1cm intervals in the anal canal. Mean resting and squeeze pressures were calculated at all levels. Maximum tolerated rectal capacity was measured in milliliters (mL) using an air-filled balloon by increasing in 10 mL increments. For endoanal ultrasound evaluation, an endoanal probe (B-K Medical Systems, Inc., Willmington, MA) was used to evaluate for disruption of the internal and external anal sphincters at 5 millimeter intervals. Subjects were classified as older versus younger based on their age 65 or older versus younger than 65 years, respectively.

Demographic data, questionnaire scores, manometry and ultrasound results were analyzed using t-test or analysis of variance (ANOVA) for continuous variables, and chi-square test for categorical variables as appropriate. Multivariable linear regression was performed to further assess the association between the QOL impact and age, adjusting for covariates potentially influencing the difference observed in QOL between age groups as noted on bivariate analyses. Statistical analysis was conducted using SAS version 9.4 (SAS Institute, Inc., Cary, NC). A 0.05 level of significance was used in all analysis.

RESULTS

Of 879 subjects, 286 and 593 were classified as older and younger, respectively. Mean ages for older and young groups were 71.4 ± 5.3 and 51.3 ± 10.5 years, respectively. Baseline demographic differences were notable for older women with a lower rate of obesity (30.4% versus 39.1%, $p=0.01$), higher rates of diabetes (24.5% versus 17.2%, $p=0.01$), hypertension (66.1% versus 38.8%, $p<0.01$), prior hysterectomy (77.6% versus 61.2%, $p<0.01$), and prior anal sphincter surgery/sphincteroplasty (21.0% versus 14.5%, $p=0.02$). Concurrent urinary incontinence (UI), defined as leakage at least a few times a month, was noted in 70% of subjects. The rate of dual incontinence (FI and UI) was higher in older women (75.3% versus 66.8%, $p=0.01$). Solid stool leakage was more frequent in older women (83.2% versus 76.7%, $p=0.03$) whereas liquid stool leakage (83.2% versus 82.8, $p=0.88$) and fecal urgency (76.9% versus 78.8%, $p=0.54$) did not differ between groups. The rates of nulliparous and parous women were similar between older and younger cohorts (nulliparous: 3.7% versus 3.9%, parous: 96.3% versus 96.1%, $p=0.89$). Complete demographic data comparing both groups are shown in Table 1.

Fecal incontinence symptom severity as measured by the FISI was similar between groups with mean scores of 28.0 ± 11.9 and 27.6 ± 13.5 for the older and younger groups, respectively ($p=0.69$). Interestingly, condition-specific QOL impact as measured by the total MMHQ score was higher in younger women, 51.8 ± 21.8 , compared to older women 46.3 ± 22.0 ($p<0.01$, Table 2). Regarding individual subscales, younger women had higher scores for personal relationship impact (30.1 ± 32.5 older and 45.8 ± 33.5 younger, $p<0.01$) and emotional impact (51.3 ± 29.0 older and 62.3 ± 27.2 younger, $p<0.01$).

Furthermore, the age-stratified impact on QOL and symptom severity (measured by the total MMHQ and FISI, respectively) was explored stratifying by the following age classification; <50, 50-64, 65-74, and 75+ years. Based on this stratification, both condition-specific QOL and symptom severity differ among groups ($p<0.01$ and $p=0.02$, respectively). The older groups appear to have significantly lower impact scores compared to the younger groups, whereas the youngest group (<50 years) had the lowest symptom severity score (Table 3).

When asked whether they have previously discussed FI symptoms with healthcare providers, nearly 90% of all subjects reported yes to the question; the younger group had a significantly higher rate (91.5% versus 86.3%, $p=0.02$). Older women had lower SF-12 physical yet higher mental scores compared to younger women ($p<0.01$ for both, Table 2).

Controlling for covariates (race, obesity, baseline health comorbidities, prior anal surgery, prior hysterectomy, solid stool leakage and UI) potentially influencing the difference in condition-specific QOL impact between age groups, a multivariable linear regression analysis suggested younger age (a decrease in age) was an independent predictor for higher condition-specific QOL scores indicating a greater negative impact (adjusted $r^2 = 0.10$, $\beta = -0.31$, standard error 0.06, $p < 0.01$).

Resting anal sphincter pressures were lower in older women (33.0 ± 16.9 mmHg older and 37.2 ± 20.5 mmHg younger, $p < 0.01$), whereas squeeze pressures were similar between groups ($p = 0.09$, Table 4). Younger women had higher rates of both external and internal sphincter defects (7.7% versus 20.2% and 12.2% versus 26.8%, respectively, $p < 0.01$ for both, Table 4). Maximum tolerable rectal capacity was similar between groups (125.0 ± 62.1 mL older, 117.9 ± 62.7 mL younger, $p = 0.11$, Table 4).

DISCUSSION

The current study demonstrated that baseline clinical characteristics and underlying medical conditions in women seeking care for FI symptoms differed between age groups. A higher rate of existing medical conditions and concurrent UI as well as prior history of pelvic and anal surgeries was observed among older women compared to the younger cohort. Interestingly, FI symptom severity was similar between the age groups, yet younger women sustained a greater negative impact on their QOL, especially in relationship and emotion factors. The intergroup difference in the MMHQ scores in this analysis was not only statistically significant but also meets the minimally important clinical difference (MID, -3) reported in the literature.¹⁵ After controlling for potentially important covariates, younger age was independently associated with a greater negative impact on condition-specific QOL with worse symptom bother. This may potentially be due to older women often perceiving incontinence as a “normal part of aging,” whereas younger women may be disturbed by any degree of FI. Younger women reporting worse QOL due to FI symptoms was also demonstrated by Wang et al.¹⁶

Interestingly, the subscale scores of the MMHQ differed between groups; specifically, the differences were observed in social, relationship, and emotion subscales. Existing data show that older adults frequently manage FI with self-care practices most commonly by changing diet, wearing a sanitary pad/brief, and reducing social activities. Older women with greater chronic health problems are more likely to engage in self-care practices often due to inability to work or travel.¹⁷ This may at least partially explain the differences in the impact of FI on QOL between age groups.

Patients are often reluctant to seek care for FI; as low as 10-30% of women suffering from accidental bowel leakage had reported symptoms to a physician, often attributing to delayed management.^{18–25} A positive correlation has been shown between symptom impact and health seeking behaviors. Younger women are more likely to have discussed their symptoms with their doctors.²⁶ Our patients were from a tertiary specialty clinic, thus generalizability may be limited as nearly 90% of the patients in this study reported they have previously discussed their bowel symptoms with healthcare professionals.

Aging associated physiologic changes are thought to be a contributory factor to FI symptoms. In our cohort, we found that older women had diminished sphincter function demonstrated by lower resting pressures, whereas a higher proportion of younger women had disrupted anal sphincter complex, both internal and external sphincters. Current data in the literature regarding the aging-related changes on anal sphincter integrity and function are somewhat conflicting. One study demonstrated that aging was associated with reduced anal squeeze pressures, reduced rectal compliance and sensation. However, these women were healthy asymptomatic subjects without FI and only 6 patients in the study were over age 70 (mean age 44 ± 2 years).²⁷ Wang et al reported no difference in resting pressures between older and younger women, whereas older women had a higher median squeeze pressure compared to younger women. This was explained by a higher proportion of the younger women having sphincter defects and a thin perineal body in their study. The difference in incremental squeeze pressures was greater among women with sphincter defect larger than 90 degrees.¹⁶

Other studies demonstrated that lower squeeze pressures did not correlate with age.^{28–31} A reduction in resting pressures potentially due to thickening of the internal anal sphincter and loss of the endovascular cushion have also been demonstrated.^{32,33} The inconsistent findings in the current literature are perhaps due to small sample sizes, limited data on healthy women as control, and the heterogeneity in the study populations.

Rectal capacity and hypersensitivity have been shown to be associated with FI, especially incontinence with fecal urgency. An association between aging and hypersensitivity has also been reported.^{26–28} In the current study, the maximum tolerable rectal capacity did not differ between groups, which is likely explained by the similar rates of fecal urgency between younger and older women in this study.

The current study has limitations including the retrospective study design. In addition, detailed obstetric information was not included in the analysis. However, this study focuses on the impact of aging on fecal incontinence. Existing data suggest that pregnancy, mode of delivery, and obstetric anal sphincter injuries are contributing factors for peri- and postpartum anal incontinence, and these factors do not appear to be as important for chronic FI as previously believed. Multiple longitudinal cohort studies (up to 30 years) concluded that no difference was observed for the rate of fecal or anal incontinence with regards to mode of delivery (cesarean or vaginal), whether sustaining OASIs at the time of delivery, or number of pregnancies.^{34–38} The current study is also limited by lacking patient reported duration of FI symptoms and the assessment of rectal prolapse, especially as low resting pressures can be seen in patients with rectal prolapse, often present in the older population. Furthermore, the multivariable regression model resulted in high variability (adjusted $r^2 = 0.10$); however, an independent association was observed between younger age and a greater negative impact on condition-specific QOL after controlling for other covariates ($p < 0.01$).

The strengths of the current study include the significantly larger sample size confirming the findings observed in other small sample studies. This study included nearly 900 subjects; both objective and subjective assessments using validated patient reported outcome measures and baseline characteristics are available in all patients allowing for a robust

analysis. In addition, the large sample size allowed further exploration of the age-stratified impact on condition-specific QOL and symptom severity using the age classification (<50, 50-64, 65-74, and 75+) as the etiology and risk factors often differ among these groups. Such age classification is consistent with the current literature on dividing the “old” age into younger than 75 (“young-old”) and over 75 years of age (“old-old”).

CONCLUSIONS

Characteristics differ between older and younger women seeking care for FI. The differential impact on QOL and age-related phenotypes may provide useful information for patient counseling and developing individualized management algorithms for women with FI. Given the paucity of data, age is an important variable to consider in the assessment of patient-centered outcomes. As FI phenotypes often differ, age related impact of FI deserves further investigation.

ACKNOWLEDGMENT

The authors thank Nathan P. Judge, BS, for his assistance with the acquisition of data.

Grant Support: Partially supported by the NIH/NICHD Women’s Reproductive Health Research Career Development Program (RFA HD-15-011)

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Table 1.

Demographics and clinical factors in older and younger women seeking care

Characteristics \ Groups	Older Women (N=286)	Younger women (N=593)	p-value
Age (years), mean $\pm$ SD	71.4 (5.3)	51.3 (10.5)	<0.01
White Race, n (%)	260 (90.9)	509 (85.8)	0.03
Obese BMI, n (%)	87 (30.4)	232 (39.1)	0.01
Nulliparous, n (%)	10 (3.7)	21 (3.9)	0.89
Diabetes, n (%)	70 (24.5)	102 (17.2)	0.01
Hypertension, n (%)	189 (66.1)	230 (38.8)	<0.01
Inflammatory bowel disease, n (%)	24 (8.4)	56 (9.4)	0.61
Prior anal sphincter surgery, n (%)	60 (21.0)	86 (14.5)	0.02
Prior colorectal surgery, n (%)	22 (7.7)	60 (10.1)	0.25
Cholecystectomy, n (%)	90 (31.5)	203 (34.2)	0.42
Hysterectomy, n (%)	222 (77.6)	363 (61.2)	<0.01
Urinary Incontinence, n (%)	207 (75.3)	378 (66.8)	0.01
Fecal urgency, n (%)	220 (76.9)	467 (78.8)	0.54
Solid stool leakage, n (%)	238 (83.2)	455 (76.7)	0.03
Liquid stool leakage, n (%)	238 (83.2)	491 (82.8)	0.88

SD, standard deviation

For continuous variables, two sample t test was used. For categorical variables, chi-square test was used.

Table 2.

Fecal incontinence symptom distress and impact on quality of life scores in older and younger women seeking care

	Older women (N=286)	Younger women (N=593)	p-value
Total MMHQ, mean $\pm$ SD	46.3 $\pm$ 22.0	51.8 $\pm$ 21.8	<0.01
Subscales of MHQ, mean $\pm$ SD			
1. Impact	55.0 $\pm$ 23.9	57.3 $\pm$ 24.9	0.18
2. Role	45.0 $\pm$ 29.4	48.8 $\pm$ 29.0	0.07
3. Physical	46.8 $\pm$ 30.8	50.8 $\pm$ 30.3	0.07
4. Social	39.2 $\pm$ 33.6	43.8 $\pm$ 32.5	0.05
5. Relationship	30.1 $\pm$ 32.5	45.8 $\pm$ 33.5	<0.01
6. Emotion	51.3 $\pm$ 29.0	62.3 $\pm$ 27.2	<0.01
7. Sleep/Energy	34.3 $\pm$ 31.0	37.6 $\pm$ 33.1	0.16
8. Severity	68.8 $\pm$ 35.4	68.0 $\pm$ 27.7	0.70
FISI	28.0 $\pm$ 11.9	27.6 $\pm$ 13.5	0.69
SF-12 Subscale Score, mean $\pm$ SD			
PCS *	39.7 $\pm$ 11.2	42.3 $\pm$ 11.9	<0.01
MCS *	45.3 $\pm$ 12.1	40.8 $\pm$ 12.2	<0.01

PCS, Physical Component Score; MCS, Mental Component Score; MMHQ, Modified Manchester Health Questionnaire; FISI, Fecal Incontinence Severity Index; SF-12, Short Form-12; SD, standard deviation;

* PCS and MCS have 98 patients missing scores: Older women (N=248), Younger women (N=533)

Two sample t-test was used.

Table 3.

Age-stratified impact of fecal incontinence on quality of life and symptom severity

Age groups	<50 (N=214)	50-64 (N=379)	65-74 (N=209)	75+ (N=77)	p-value
Age (years), mean $\pm$ SD	40.0 $\pm$ 7.6	57.8 $\pm$ 4.3	68.8 $\pm$ 2.7	78.6 $\pm$ 3.5	
MMHQ total, mean $\pm$ SD	50.8 $\pm$ 22.4	52.4 $\pm$ 21.5	46.9 $\pm$ 21.7	44.6 $\pm$ 22.8	<0.01
FISI, mean $\pm$ SD	25.3 $\pm$ 13.9	28.9 $\pm$ 13.2	27.7 $\pm$ 11.9	28.6 $\pm$ 11.6	0.02

SD, standard deviation

One-way ANOVA test was used.

Table 4.

Anorectal function and anatomy evaluation by anorectal manometry and endoanal ultrasonography between older and younger women seeking care

	Older women(N=286)	Younger women(N=593)	p-value
Anorectal Manometry, mean $\pm$ SD			
Resting Pressure, mmHg	33.0 $\pm$ 16.9	37.2 $\pm$ 20.5	<0.01
Squeeze Pressure, mmHg	69.6 $\pm$ 30.0	73.7 $\pm$ 34.9	0.09
Rectal Capacity, mL	125.0 $\pm$ 62.1	117.9 $\pm$ 62.7	0.11
Endoanal ultrasonography, n (%)			
EAS defect	22 (7.7)	120 (20.2)	<0.01
IAS defect	35 (12.2)	159 (26.8)	<0.01

SD, standard deviation; EAS, external anal sphincter; IAS, internal anal sphincter

For continuous variables, two sample t test was used. For categorical variables, chi-square test was used.