

## AOGS MAIN RESEARCH ARTICLE

# Functional bowel disorders in pregnancy: effect on quality of life, evaluation and management

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*Department of Obstetrics and Gynecology, Loyola University Chicago Stritch School of Medicine, Maywood, Illinois, USA***Key words**

Bowel function, constipation, quality of life, pregnancy, medical records

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E-mail: sgrazia@lumc.edu**Conflict of interest**

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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**Abstract**

**Objective.** To characterize functional bowel disorders in a population of pregnant women, evaluating effects on quality of life, management and follow up. **Design.** Prospective cohort. **Setting.** University center, USA. **Population.** Women in the first trimester ( $n = 104$ ). **Methods.** After enrollment evaluations, measures were repeated in the third trimester. Overall bowel function was assessed using the Rome III Questionnaire for Functional Bowel Disorders. Quality of life symptoms were assessed with the Irritable Bowel Syndrome Quality of Life Measure. Physician documentation of bowel symptoms and subsequent treatment in pregnancy were ascertained by retrospective chart review. **Main outcome measure.** Quality of life in first trimester. **Results.** A majority (75%) of the women at the first trimester evaluation reported having one or more functional bowel disorders. The overall quality of life status was rated highly functional, with a total average score of 94.9. Of the 75 women reporting functional bowel disorders, only 18 (24%) were identified in the medical record. Overall documentation of any bowel function was identified in the majority (64%) of cases. Most commonly, no discussion of treatment was documented, and follow up was recorded in only 27% of women with dysfunction. **Conclusions.** Nearly three-quarters of women in the first trimester report symptoms consistent with functional bowel disorders. Overall quality of life measures are highly rated. There is a discrepancy between what women report regarding bowel dysfunction and what is documented by providers within the medical record.

**Abbreviations:** ACOG, American Congress of Obstetricians and Gynecologists; FBD, functional bowel disorder; IBS, irritable bowel syndrome; IBS-QOL, Irritable Bowel Syndrome Quality of Life; QOL, quality of life.

**Introduction**

Pregnancy is generally considered to have an impact on anorectal function. Hormonal effects on intestinal motility, the physical displacement of bowel by the uterus, physical activity levels, as well as bony and postural changes may alter overall function. Functional bowel disorders (FBDs) include constipation, diarrhea, bloating and irritable bowel syndrome (IBS). Constipation, documented using ROME II criteria, affects 23–35% and 16–21% of women during their first and third trimester, respectively (1,2). Overall constipation rates range from 9

to 40% (3–10). Using validated measures, Bradley et al. (1) reported that 66% of pregnant women were affected by bloating during their first trimester. In the same study, the prevalence of IBS was noted to be 19%. Diarrhea,

**Key Message**

Functional bowel disorders in pregnant women have a minimal impact on quality of life. If potentially seen as normal, this may limit reporting, documentation and follow up by women and physicians alike.

described by Levy et al. (3) as more frequent bowel movements, was reported in 34% of pregnant women.

Changes in bowel function may also have an impact on overall quality of life (QOL) during pregnancy. Pauls, utilizing the Fecal Incontinence Quality of Life scale, reported 50% and 40% of women in their first and third trimester, respectively, experienced various pelvic floor symptoms, whereas overall functional status was still rated highly (11). Non-pregnant women with bowel dysfunction and constipation may suffer a negative effect on QOL measures, when compared with healthy adults (12,13).

Less is known regarding how FBDs impact prenatal care. It is unknown whether pregnant women report symptoms of bowel dysfunction to their providers at the same rate at which they experience these symptoms. Women may accept bowel dysfunction as a normal and expected part of pregnancy. Obstetric intake templates, available through the American Congress of Obstetricians and Gynecologists (ACOG), are widely used in prenatal care. These paper forms have also been integrated to electronic medical record systems. The current form does not designate specific questions to screen for FBDs. Additionally, providers may also accept these changes as normal and may choose not to address them.

The purpose of this study was to characterize the range of FBDs in a population of pregnant women, evaluating its effect on QOL, management and follow up.

## Material and methods

The Loyola University Medical Center Institutional Review Board approved this prospective cohort study (IRB# 203940051811, 27 April 2011). Women were approached and enrolled at their first trimester obstetric appointment at Loyola University Medical Center affiliated offices, which is a tertiary care referral center. Eligible women were at less than 13 weeks' gestation, 18 years or older, could read and understand English, and were without a diagnosed inflammatory bowel disorder or previous anorectal surgery.

The first trimester questionnaire was completed upon enrollment. The same questionnaire was completed during the third trimester, between 34 and 38 weeks. The survey was self-administered in the privacy of the clinic room and collected at the end of the office visit. Demographic information such as age, body mass index, race and ethnicity, in addition to gestational age at visit, gravity and parity were collected from the chart.

Overall bowel function was assessed using the Rome III Questionnaire for Functional Bowel Disorders. FBDs included constipation, diarrhea, bloating and IBS. The Rome III Questionnaire is a self-report survey that identifies

FBDs. Question responses include yes/no responses, a 5-point ordinal response scale for conditional questions (never or rarely to always) and a 7-point ordinal response scale for frequency questions (never to every day).

QOL symptoms were assessed with the Irritable Bowel Syndrome Quality of Life (IBS-QOL) Measure (14). The IBS-QOL Measure is a self-report quality-of-life measure specific to IBS that may be used to assess the impact of both IBS and FBDs. The survey consists of 34 questions, each with a 5-point response scale. The responses are averaged for a total score and converted to a 0–100 scale using a provided algorithm. Higher scores indicate better IBS-specific-QOL. Reported subset scores include Dysphoria, Interference with Activity, Body Image, Health Worry, Food Avoidance, Social Reaction, Sexual, and Relationships (14).

Dietary fiber intake was measured using the Block Fruit/Vegetable/Fiber Screener (NutritionQuest, Berkeley, CA, USA). The Screener included seven questions about fruit and vegetable intake and three questions about foods high in fiber (10 questions in total). Data collected was analyzed using prediction equations to generate point estimates of total fruit/vegetable servings and dietary fiber (g).

Physician documentation of bowel symptoms and subsequent treatment of these symptoms throughout pregnancy were ascertained by retrospective chart review of the electronic medical record. The date of the intake visit and any documentation of bowel function were recorded. The pregnancy episode worksheet was reviewed to ascertain whether there was any documentation of bowel function, either normal or abnormal, at any point throughout the pregnancy. The recommendations for treatment of bowel symptoms were categorized as follows: none, expectant management, behavior changes (fluids), diet changes (fiber), medical therapy, consultation requested. Any follow up of treatment of bowel symptoms was recorded. A complete chart review of all progress notes recorded at the Loyola University Medical Center in the three months preceding the pregnancy was performed. Any documentation of bowel symptoms was noted for both gynecology office visits and visits with outside departments.

Health care providers were aware of the ongoing investigation and were not restricted to access of patient responses. A low threshold was used to indicate documentation. Any notations by faculty, resident, medical student, nurse practitioner and nurse were considered sufficient documentation. There was no judgment regarding the quality of documentation.

Data were evaluated with IBM SPSS Statistics Version 21 (IBM Corp., Armonk, NY, USA) using descriptive statistics, frequency distributions, and Mann–Whitney tests

for non-parametric data. Univariate linear regression analysis was used to identify independent factors affecting QOL in the first trimester. A *p*-Value of <0.05 was considered significant.

### Results

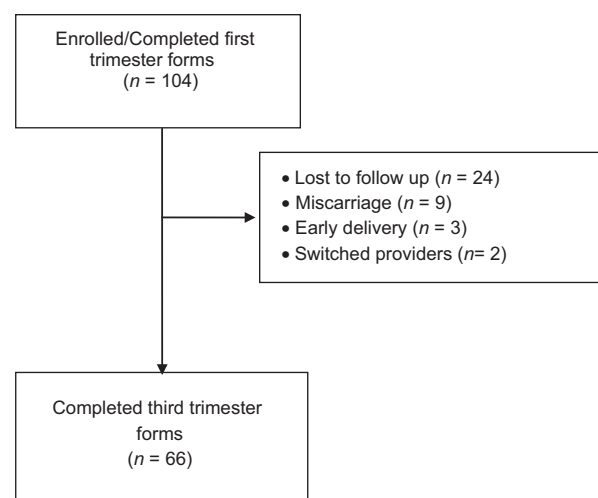
In all, 104 women were enrolled and completed the first trimester questionnaire. Table 1 shows the demographic comparisons between women with and without FBD.

A majority (72%) of the first trimester women reported having one or more FBDs: 46% reported constipation, 49% reported bloating, 44% had IBS and 5% reported diarrhea. The overall QOL status was rated highly functional, with a total average score of 94.9. Women who reported one or more FBDs had a lower overall QOL status compared with those without (93.6 vs. 98.2, *p* < 0.01). Table 2 shows the first trimester subset domains for the QOL score. For all subset domains of the QOL score, body image, health worry and food avoidance scores were lower for women reporting FBDs, compared with other domains during the first trimester. Univariate linear regression was performed, using FBDs and fiber intake for the analysis. Constipation (-4.4 points, *p* < 0.01) and bloating (-4.0 points, *p* < 0.01) remained as independently significant factors affecting overall QOL status.

Sixty-six women completed the third trimester questionnaire. Figure 1 quantifies our non-responders in the

**Table 2.** Mean quality of life scores in first trimester women with and without functional bowel disorders (FBD).

	1st Trimester		<i>p</i> -value
	No FBDs	1 + FBD	
Overall	98.3	93.6	<0.01
Dysphoria	98.9	95.7	<0.01
Activity interference	98.4	95.6	<0.01
Body image	97.0	87.6	<0.01
Health worry	97.7	90.1	<0.01
Food avoidance	95.4	89.4	0.01
Social reaction	98.7	95.4	<0.01
Sexual	100.0	94.3	<0.01
Relationships	99.7	96	<0.01



**Figure 1.** Study enrollment and completion status.

**Table 1.** Demographics on the study population of women with and without functional bowel disorders (FBD) in pregnancy.

	Without FBDs ( <i>n</i> = 29)	With FBDs ( <i>n</i> = 75)	<i>p</i> -value
Mean			
Age	28.2	30.2	0.11
Body mass index	27.2	26.7	0.73
Gravity	2 <sup>a</sup>	2 <sup>a</sup>	
Parity	0 <sup>a</sup>	0 <sup>a</sup>	
Fiber score	16.2	16.9	0.48
Percent			
Race			0.69
Caucasian	60.8	56.2	
African-American	21.4	20.6	
Hispanic	7.1	2.7	
Asian	0.0	8.2	
Other	10.7	12.3	
Ethnicity			0.37
Non-Hispanic	89.3	87.7	
Hispanic	10.7	12.3	
Smoking			0.08
Currently	0.0	9.3	
Not Currently	100.0	90.7	

<sup>a</sup>Median value.

third trimester. No significant differences in demographics and bowel symptoms in the first trimester were noted between responders and non-responders (data not shown). Sixty percent (40/66) of women in the third trimester reported and 3% had diarrhea. The overall QOL status was also highly rated, with the total average score of 95.7. Women with FBDs rated their overall status lower, compared with women without FBDs (93.1 vs. 99.6, *p* < 0.01).

Table 3 illustrates the documentation of FBDs. All 18 women identified through documentation had objective evidence of an FBD on survey. FBDs not identified in documentation were evenly distributed among constipation, bloating and IBS.

Overall, documentation of any bowel function, normal or abnormal, was recorded in 64% of prenatal charts. The majority of the documentation present (60%) was identified at the initial intake visit. The median number of visits to providers was 13 per pregnancy. FBDs were most often documented at the first recorded visit in the

**Table 3.** Identification and documentation of functional bowel disorders (FBD).

FBD identified in documentation	Constipation (n = 48)	Diarrhea (n = 5)	Bloating (n = 51)	IBS (n = 46)
Yes (n = 18)	12	3	12	16
No (n = 57)	36	2	39	30

IBS, irritable bowel syndrome.

**Table 4.** Documentation of treatment for women identified with functional bowel disorders.

	Women (% of identified) n = 18
Treatment discussed?	
None	8 (44)
Medical therapy (stool softeners)	5 (28)
Expectant management	3 (17)
Diet changes	2 (11)
Behavior changes	0 (0)
Consultation requested	0 (0)
Documented follow up	5 (27)

pregnancy (median visit #1, range 1–10), corresponding to gestational age between 8 and 10 weeks.

Table 4 shows rates of documentation of treatment for identified FBDs. Discussion of treatment was documented in 10 of the 18 women identified as having an FBD. The only medical therapy prescribed was for stool softeners. Follow up to treatment was recorded in only five (27%) of the charts in which a problem had been documented, corresponding to 50% of the cases in which treatment had been initiated.

In the three months preceding pregnancy, 24% of women visited the Department of Obstetrics and Gynecology. Of those, 44% had some documentation of bowel function. Thirty-eight percent of women visited at an outside department in the three months preceding pregnancy. Of these, 27% had provider documentation of bowel function identified. Only 5% had a bowel dysfunction-associated diagnosis or symptom in their systemwide problem list.

## Discussion

This prospective study found that FBDs were highly prevalent throughout pregnancy. Approximately 75% of first trimester and 60% of third trimester women reported having at least one FBD. Almost half the women surveyed reported constipation symptoms in pregnancy, which is at the higher end of the spectrum reported in the current literature (1–10). Bradley et al. (1) characterized bloating,

in relation to constipation using ROME II criteria, as affecting up to 66% of pregnant women in their first trimester. Our assessment of bloating as an independent FBD, utilizing the ROME III criteria, was slightly lower at 49% of women in the first trimester. Additionally, our higher reported rate of IBS, compared with Bradley, may be related to different definitions (Rome II vs. Rome III) and time frames of symptoms (last one month vs. last three months).

Although FBDs have a negative impact on QOL, overall QOL scores remained highly rated among women with and without FBDs. These are similar findings to Pauls et al. (11), who found that women with various pelvic floor symptoms continued to report high overall functional status. This is in contrast to the general population, where gastrointestinal disorders significantly lower overall QOL scores compared with healthy individuals (15). Pregnant women may be more tolerant of functional changes, especially if viewed as a self-limited condition.

Univariate analysis revealed that constipation and bloating remained independent factors affecting QOL in the first trimester. In addition, both negatively affected body image QOL subset score to a higher degree than other subset scores. This echoes the finding by Pauls et al. (11) that women experiencing pelvic floor dysfunction reported lower body image scores (11). Bowel dysfunction, by affecting self reported body image, may make women feel sluggish, unclean or limit what they feel comfortable wearing. These results may be confounded by pregnancy in general. However, providers could utilize these simple categories to help identify women requiring additional bowel management.

Overall bowel function, either as normal or abnormal, was documented in the majority (64%) of charts, most often as part of the review of systems at the intake visit. However, while 75 women reported symptoms on the intake questionnaire upon enrollment in our study, only 18 of the charts surveyed contained a reference to bowel dysfunction. This leaves 76% (57 of 75) of the women undocumented, and potentially incorrectly categorized as normal. There may be several explanations for a lack of documentation of bowel symptoms. Providers may be screening for bowel disorders but not documenting the conversation. Current standardized forms for prenatal care from the ACOG do not have a designated area for documentation. Revision of the form may improve documentation. A lack of documentation may also signify a lack of screening. Providers may view bowel dysfunction as a low priority problem or a normal physiologic change in pregnancy. Additionally, women may view FBDs as a normal part of pregnancy and thus be less likely to report these symptoms to their provider unless they are severe or have a significant impact on their QOL.

At the time of writing this manuscript, no data were found within the current literature discussing physician documentation of antenatal bowel dysfunction with which to compare our results. A similar study investigating urinary incontinence screening both in pregnancy and the postpartum period found a lack of documentation of symptoms. These authors found that only 3.1% of the medical records reflected any assessment of urinary incontinence during pregnancy (16).

When FBD was properly identified, treatment of the disorder was documented in only 55% of the charts. When treatment was documented, half of all providers recommended medical therapy, such as stool softeners, as their first line treatment. The remaining providers were divided between recommending dietary changes (20%) and taking a watchful waiting, expectant management (30%) approach. Follow up was documented in only 50% of the charts in which treatment had been initiated. This evidence suggests that providers may view bowel dysfunction in pregnancy as normal, or as a lower priority problem.

Forty-four percent of pre-pregnancy visits to obstetricians and gynecologists resulted in documentation of bowel function, normal or abnormal, compared with 27% of other primary care providers. Only 5% of women had a diagnosis of bowel dysfunction in their problem list. Overall documentation of bowel function appears to remain low. More specific analysis is needed to compare accurately the rates at which providers assess bowel function across the range of medical specialties.

Our study has several limitations. Figure 1 describes our loss to follow-up, limiting our ability to assess changes across pregnancy. This is a single-center study with a diverse patient population. However, as a tertiary care, referral center, the acuity level of the women studied may contribute to an increased level of symptoms and complaints. This may limit generalizability. We utilized the Rome III Functional Bowel Disorder Questionnaire as well as the IBS-QOL, both validated questionnaires. However, they have not been validated specifically for pregnant populations, which may affect the conclusions drawn from the results. Additionally, the IBS-QOL assesses QOL measures, specifically with IBS. Although it can be used with FBDs, this may limit the questionnaire's ability to accurately assess function related to constipation, bloating and diarrhea. Our study was designed to characterize FBDs and QOL. As such, it was not powered to detect any differences, only to describe potential factors.

Additionally, lack of documentation does not mean bowel function was not discussed. Retrospective review of the medical record does not contain the entire conversation between providers and patients. Our conclusion is

that bowel function is poorly documented in pregnancy. A system that encourages documentation of screening may improve symptom assessment and control.

Nearly three-quarters of women in the first trimester report symptoms consistent with an FBD. While overall QOL measures are highly rated, constipation and bloating appear to have a negative effect on status, specifically body image. There is a discrepancy between what women report regarding bowel dysfunction and what is documented by providers within the medical record. Since changes are common, and QOL is generally not affected, both women and providers may not perceive these as problems. However, screening may help identify outliers who could benefit from additional evaluation and management. Future studies should evaluate the effects of identification and treatment of FBD in early pregnancy, and explore the role of provider bias concerning bowel function in pregnancy and the role of documentation templates.

## Funding

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