

# Irritable bowel syndrome symptoms during pregnancy trimesters

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**BACKGROUND:** Irritable bowel syndrome (IBS) is one of the most common functional gastrointestinal disorders presented by bowel habit change and abdominal pain without any structural defect. Prevalence of IBS in Iran was reported between 4.2-18.4%. Although the etiology is still unknown but many factors such as motility disorders, genetics, nutrition, behavioral disorders may cause it. During pregnancy, gastrointestinal symptoms like nausea and vomiting are very common. The anxiety level will also increase during this period. This study was designed to evaluate the IBS symptoms during pregnancy. **METHODS:** In a cross-sectional study, IBS symptoms in pregnancy were compared with normal subjects. Patients were included to the study after filling the IBS questionnaire. **RESULTS:** 323 pregnant subjects and 98 controls were included. IBS was seen in 23.5% of pregnant subjects and in 13.3% of patients in control group ( $p < 0.05$ ). Constipation dominant IBS had a significant increase in third trimester comparing with first and second trimester ( $p < 0.05$ ). Diarrhea dominant IBS had a significant increase in second and third trimester comparing with control group ( $p = 0.04$ ). Mixed symptom-subtype of IBS had a significant increase in third trimester comparing with control group ( $p = 0.01$ ). **CONCLUSIONS:** Frequency of IBS symptoms was higher in pregnant subjects than in control group. This could be because of hormonal changes and psychological factors which change during pregnancy.

**KEYWORDS:** Irritable Bowel Syndrome, Pregnancy, Prevalence

## BACKGROUND

Irritable bowel syndrome (IBS) is a chronic functional gastrointestinal (GI) disorder which is characterized by recurrent abdominal pain or discomfort associated with a change in bowel habits.<sup>[1]</sup> IBS is more prevalent (6-22%) in western reports than eastern countries (2-17%).<sup>[2]</sup> Prevalence of IBS in Iran was estimated from 4.2% to 18.4% in different reports.<sup>[3,4]</sup>

Functional GI disorders such as IBS is more common in women and it could be because of their GI transit time, visceral sensitivity, the way of pain processing in their nervous system, the type of reaction to stress and fluctuations of female sex hormones during menstrual cycle, which could affect gut function.<sup>[5,6]</sup> IBS symptoms could aggravate after surgeries, stressful conditions, infection or changes of circulating sex hormones level.<sup>[7,8]</sup> As there is no diagnostic biological marker for functional GI disorders, diagnosis is based on using symptom based criteria which is named ROME III criteria.<sup>[6]</sup>

Heitkemper et al. in a meta-analysis showed that the increasing symptoms of IBS

which is seen in one third of females during premenstrual cycle may be due to the low ovarian function and concluded that estrogen or progesterone withdrawal may be the cause of these symptom flare-ups.<sup>[9]</sup> Therefore, hormonal changes may have an impressive influence on IBS symptoms aggravation.

During pregnancy both physical and mental status in women change. Pregnancy causes both anatomic and physiologic changes in the GI tract. Nausea and vomiting, emesis, diarrhea, constipation, hemorrhoids, reflux and functional disorders are all reported during pregnancy.<sup>[10,11]</sup> The mentioned hypothesis for the GI symptoms during this period is due to the influence of massive hormonal changes and it seems that the enlarging gravid uterus play a little role in this aspect.<sup>[12]</sup>

Psychological disorders such as depression and anxiety are also common; both during pregnancy and after delivery. These factors could have some impacts on changing of the bowel function either.<sup>[13,14]</sup>

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As mentioned above, IBS symptoms could aggravate after changes in the level of circulating sex hormones and also during stressful conditions. Pregnancy as a severe stressful condition during which sex hormones are also encountered with major changes, could cause or aggravate IBS symptoms. The discomfort which is originated from GI symptoms may add a huge load in the level of women stress and anxiety and may act as a vicious cycle to increase GI problems.

In this study we aimed to define the difference in IBS prevalence between several trimesters of primiparous pregnant women in comparison with nulliparous participants.

## METHODS

This was a cross-sectional study which was done in several gynecologic outpatient clinics of Islamic Azad University (Najafabad branch) during April-November 2011. Three hundred and twenty three Iranian primiparous pregnant women (in different trimesters of pregnancy) and 98 nulliparous volunteers as control group enrolled in this study. This research was approved by research committee of medical school of Islamic Azad University, Najafabad Branch (Thesis number: 15010101881022).

We used convenience sampling method. After describing the goals of the study, informed consent was obtained from all the participants. Case group contained 3 subgroups; 101 subjects were in first trimester, 110 in second and 112 participants were in third trimester. All patients were primigravida. We used the primigravida criterion as the inclusion criteria for case group in order to omit the influence of multiparity on the size of women's uterus which could affect GI motility and function as a physiologic abdominopelvic factor. Those who had history of abdominopelvic surgery, malignancy and organic disease or were unreliable were excluded.

The subjects in control group were also selected from married volunteers who had not previous history of any pregnancy or abortion, abdominopelvic surgery, malignancy and organic disease. A physician ruled out the major psychiatric problems in both groups by direct interview as well as reviewing participants' medical history.

### Measures and Measurement

#### IBS Questionnaire

ROME III criteria for functional gastrointestinal disorders were published in 2006. According to this

criterion IBS is diagnosed when recurrent abdominal pain or discomfort persist at least three days in one month and in the last three months they were associated with two or more of this items:

- A) Improvement with defecation
- B) Onset associated with a change in frequency of stool
- C) Onset associated with a change in appearance of stool

In addition, there should not be any evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject's symptoms.<sup>[15]</sup>

There are 4 subtypes of IBS due to ROME III criteria.<sup>[15]</sup> IBS-C is a condition that constipation is predominant, in IBS-D diarrhea is predominant, in IBS-M a mixture of constipation and diarrhea exist and IBS-U (undifferentiated) is a condition that none of them is predominant. We used the Persian version of questionnaire for ROME III criteria which is a self-administered questionnaire that contains 26 items. There is a global consensus about using this questionnaire in IBS diagnosis. In Farsi version of IBS questionnaire, Cronbach's alpha coefficient was found to be 0.70 and its sensitivity was 0.91.<sup>[16]</sup>

Quantitative variables were compared between groups using Student's t-test. Chi-square test was used to study qualitative variables. In all parts  $p < 0.05$  was considered as significant. SPSS version 18 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis.

## RESULTS

This study was done on 323 primigravida pregnant women in comparison with 98 normal nulligravida subjects. In pregnant group, 101 subjects were in the first trimester, 110 were in the second and 112 in the third trimester. The mean age in the case group was  $25.5 \pm 3.8$  years and it was  $25.7 \pm 4.6$  years in the control group ( $p = 0.21$ ).

The IBS symptoms frequency in the first, second and third trimester was 17%, 19% and 33.9%, respectively. Chi-Square test did not show any statistically significant differences between trimesters ( $p > 0.05$ ).

The IBS symptoms frequency in the control group was 13.3% with a statistically significant difference between case and control group ( $p = 0.004$ ). IBS-C was more prevalent during third trimester in comparison with both the first and second trimester ( $p = 0.014$  and

$p = 0.02$ , respectively) and this was different compared to the control group ( $p = 0.01$ ). The IBS-D during pregnancy was not significantly higher than non-pregnant group ( $p > 0.05$ ). There was not also any statistically significant difference between three trimesters in the field of IBS-D ( $p > 0.05$ ). Prevalence and percentage of IBS and its subtypes in each group is listed in table 1.

Table 2 summarized distribution of patients according to their stool consolidation in each trimester. The chi-square test showed a statistically significant difference in abdominal pain and abdominal discomfort between case and control group ( $p = 0.005$ ). Regarding lumpy stool, there was also statistically significant difference as Kruskal-Wallis test reported between case and control groups ( $p < 0.05$ ); but there was no significant differences between groups in the field of diarrhea symptoms ( $p > 0.05$ ).

## DISCUSSION

In most western countries, prevalence of IBS in women is more than men. It could be because of hormonal changes and basic psychological factors. The female hormonal changes are almost completely experiences during pregnancy which will elevate the level of feminine hormonal markers that can alter both the anatomy and physiology of GI tract. Therefore,

exacerbation or induction of IBS symptoms could be justified.

There is no epidemiologic report about the prevalence of IBS during pregnancy in Iran. However, almost one third of females experience worsening of their GI symptoms during menstrual cycles due to rising progesterone level which may induce bowel muscle spasm. This hormone has a very high level during pregnancy.

This study was designed to evaluate the prevalence of IBS during pregnancy in each trimester. Our results showed that the IBS was more prevalent during pregnancy in comparison with non-pregnant subjects. It seems that the hormones secreted by placenta and other pregnancy induced hormones may affect GI motility and its function. The absorption capacity and the transit time of the bowel could be changed during pregnancy. We found that as the pregnancy progressed, the prevalence of the IBS-C type (constipation predominant) would progress and it might be due to the hormonally induced alteration of sphincter tones.

As sever distress may be induced by constipation in pregnant women (especially in the area of increased intra abdominal pressure which may press the enlarged uterus of the third trimester), the well known advices for changing life style and diet could help.

**Table 1. Frequency of irritable bowel syndrome and its subtypes in each group**

	IBS-C	IBS-D	IBS-M	IBS	P-value
Control Group	2 (15.4%)	3 (23%)	8 (61.6%)	13 (100%)	< 0.05
Case group					
First trimester	4 (23.5%)	6 (35.2%)	7 (41.3%)	17 (100%)	> 0.05
Second trimester	5 (23.8%)	7 (33.3%)	9 (42.9%)	21 (100%)	> 0.05
Third trimester	14 (36.8%)	7 (18.4%)	17 (44.8%)	38 (100%)	< 0.05
P-value (between case and control)	< 0.05	> 0.05	> 0.05		

IBS-C: constipation predominant irritable bowel syndrome; IBS-D: diarrhea predominant; IBS-M: mixture of constipation and diarrhea

**Table 2. Distribution of participants according to their stool consolidation**

Symptoms	Group	Never or rarely	Sometimes	Often	Most of the time	Always
Lumpy stool	First trimester	34	38	12	9	4
	Second trimester	30	47	9	11	9
	Third trimester	42	35	10	6	17
	Control	51	25	12	7	3
Watery stool	First trimester	31	32	13	11	6
	Second trimester	28	30	16	24	8
	Third trimester	32	24	17	29	7
	Control	35	49	8	2	1

Psychological factors such as stress, anxiety and depression were reported as an IBS risk factor during pregnancy. Panic attacks and physical stresses are also reported as a risk factor for irritable bowel syndrome.<sup>[17]</sup>

Adibi et al. showed in their case-control study that the IBS was more prevalent during first trimester of pregnancy than after caesarian section (8.8% and 4.4% respectively).<sup>[18]</sup> Our findings showed a higher prevalence of IBS in the first trimester in comparison with their report. This could be because of different diagnostic criteria (they used ROME II criteria).

Heitkemper reported in a review article in 2009 that IBS patients suffer from more pain during their menstrual period and irregular menstrual cycles was seen more than general population. It was mentioned in this report that ovarian hormones and IBS symptoms had a reverse correlation.<sup>[9]</sup> Our findings were against Heitkemper's report; therefore, further studies are seemingly needed.

Due to the influence of risk factors such as psychological factors (stress and depression) and ovarian hormonal changes in aggravation of IBS symptoms, treatment of these treatable risk factors could prevent IBS symptoms during pregnancy.

We also suggest to setup further studies in women who are suffering from IBS to detect the influence of pregnancy in changing the IBS symptoms. According to our findings, we suggest that next studies evaluate other functional gastrointestinal disorders during pregnancy or evaluate the role of IBS treatment and its effect on IBS symptoms during pregnancy.

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