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Research Article

An Association of Dietary Habits and Gastroesophageal Reflux Disease (GERD) Symptoms during Pregnancy in Kashmir

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Abstract. Gastroesophageal Reflux Disease (GERD) is a chronic condition characterized by stomach acid backflow into the oesophagus. The backflow of stomach acid can inflame the esophagus, leading to symptoms such as burning sensations, food reflux, difficulty swallowing, and chest pain. This condition occurs when the muscular ring between the esophagus and stomach fails to function properly, allowing stomach contents to flow back up into the esophagus. During pregnancy, hormonal changes and increased stomach pressure can exacerbate symptoms. Dietary habits play a crucial role in managing GERD symptoms. This article explores the association between dietary habits and GERD symptoms during pregnancy, in Kashmir highlighting common triggers and potential alleviating foods. A balanced diet and healthy eating habits can help manage GERD symptoms, and pregnant women should work with their healthcare provider to develop a personalized plan.

Keywords: Pregnancy; GERD; Dietary Habits; Skipping Meals; Kashmir

INTRODUCTION

According to The Montreal Consensus, Gastro-oesophageal Reflux Disease (GERD) is a condition that develops when the reflux of stomach contents causes troublesome symptoms and/or complications. The characteristic symptoms of GERD, recognized by the Consensus are heartburn and regurgitation (V Dall' Alba et al.' 2015). Gastro-oesophageal reflux disease (GERD) is one the most common medical complaints in pregnant women. Its prevalence has been reported to reach as high as 80% in certain populations. The prevalence of GERD is also increased as pregnancy progresses from the first to third trimester. Regurgitation, acid taste in mouth and heartburn are among the most common GERD symptoms, with heartburn and regurgitation causing the most significant negative impact (RAR Ali et al., 2022). Typically, the heartburn of pregnancy is new onset and is precipitated by the hormonal effects of oestrogen and progesterone on lower oesophageal sphincter function (CN Broussard et al., 1998). GERD pathophysiology is multifactorial and includes both peripheral and central mechanisms. At the level of the esophagus, dysfunction of the oesophageal-gastric junction (e.g. decreased lower oesophageal sphincter pressure) and impaired oesophageal clearance, contribute to the presence of acid and other stomach contents, refluxing into the oesophagus and remaining there for longer than normal, leading to severity in GERD symptoms (L Guadagnoli et al., 2022). Increased progesterone hormone levels in pregnancy lead to more frequent and higher relaxation of the lower esophageal sphincter. Esophageal movements are also slowed down and gastric emptying time is prolonged. While this provides maximal food absorption for the developing foetus, the gastric pressure remains high and escape back is facilitated due to this effect. Enlarging foetus, hence the uterus, during the later phases of pregnancy lead to a gradual increase in intra-abdominal pressure, which produces pressure on the stomach, increasing reflux (V Goral et al., 2018). Among the environmental factors, lifestyle factors, in particular being overweight/obese, incorrect dietary habits, the lack of regular physical activity and smoking have frequently been suggested to be possible GERD risk factors (OEslami et al., 2017). Short meal-to-bed time (MTBT) has been reported to relate to gastroesophageal reflux disease (GERD), but evidence is lacking in pregnant women (DT Quach et al. 2021). The increasing incidence of GERD has been linked to the Western lifestyle. Factors such as cigarette smoking, alcohol consumption, a high body mass index (BMI), the presence of a hiatus hernia, inadequate sleep, and lack of aerobic exercise have all been associated with reflux symptoms or GERD. Additionally, certain foods and drinks can trigger symptomatic reflux, such as citrus, carbonated beverages, chocolate, and other food items, reducing their consumption might decrease the prevalence and severity of reflux symptoms (LBaroni et al., 2023).

Methodology

A study was carried out to assess the association of dietary habits and gastroesophageal reflux disease (GERD) symptoms during pregnancy in Kashmir. A total number of 200 respondents were selected randomly from different hospitals in Kashmir.

Materials and methods

In Kashmir, India, a cross-sectional study was carried out to investigate the relationship between pregnant women's dietary practices and symptoms of gastroesophageal reflux disease (GERD). Using a random sampling technique, 200 respondents in all were gathered from various clinics and hospitals throughout the area. Participants comprised women in the second and third trimesters of pregnancy. We included 200 participants, chosen based on the number that could realistically be recruited within the study period from local antenatal clinics. This sample was considered large enough to show meaningful differences in dietary habits and GERD symptoms across trimesters, while still being manageable for the research team.

Information gathering

Both primary and secondary sources of information were used. A systematic, interviewer-administered questionnaire was used to gather primary data, and online databases, textbooks, and published literature were used to gather secondary data in order to offer context.

Research tool

Following a review of pertinent literature, a self-developed questionnaire and interview schedule was created. Three sections comprised the tool:

General information: height, pre-pregnancy weight, current weight, family history of GERD, obstetric and demographic traits (age, parity, trimester, family type, education, occupation, income, and any history of GERD prior to pregnancy).

Dietary practices include the quantity and kind of meals eaten, patterns of skipping meals, typical dietary intake, trigger foods, and the time between meals and bedtime.

The existence, frequency, timing, intensity, disruption of daily activities, and sleep patterns of GERD symptoms, including heartburn, regurgitation, chest discomfort, and bloating.

Analysis of data

After the data were coded and imported into Microsoft Excel, the results were summarized using descriptive statistics, such as percentages and frequencies. Cross-tabulations were used to evaluate the association between GERD symptoms and dietary practices across trimesters. As this was an exploratory cross-sectional study, no formal power analysis was performed; the sample size was determined by feasibility.

RESULTS AND DISCUSSION

Table 4.1*:* Distribution of respondents as per age

		n	%
AGE (yrs)	20-25	32	16.0
	25-30	108	54.0
	30-35	52	26.0
	35-40	8	4.0
	Total	200	100.0

Table 4.1: Illustrates that the majority of the participants are aged between 25-30 years (54%) followed by 30-35 years (26%).

Table 4.2: Distribution of respondents as per parity and trimester

		n	%
PARITY	Primiparity	116	58.0
	Multiparity	84	42.0
	Total	200	100.0
TRIMESTER	2	60	30.0
	3	140	70.0
	Total	200	100.0

Table 4.2 illustrates that 58% of the participants are primiparous (first time mothers) and 70% are in their third trimester.

Table 4.3: Distribution of respondents as per family and pre pregnancy GERD

		n	%
FAMILY HISTORY OF GERD	Yes	40	20.0
	No	160	80.0
	Total	200	100.0
PRE PREGNANCY GERD	Yes	52	26.0
	No	148	74.0
	Total	200	100.0

Table 4.3: illustrates that 20% of respondents report a family history of GERD, while 26% experienced GERD before conceiving.

Table 4.4: Distribution of dietary habits

		2nd Trimester		3rd Trimester	
		n	%	n	%
Frequency of meals	3 - 4	24	40.0	88	62.9
	5 - 6	36	60.0	52	37.1
	Total	60	100.0	140	100.0
Skipping meals	Yes	56	93.3	100	71.4
	No	4	6.7	40	28.6
	Total	60	100.0	140	100.0
Reasons for skipping meals	Nausea and vomiting	28	46.7	36	25.7
	Lack of appetite	20	33.3	44	31.4

	Busy schedule	0	0.0	8	5.7
	Fatigue	8	13.3	48	34.3
	Others	4	6.7	4	2.9
	Total	60	100.0	140	100.0
Type of meal mostly skipped	Breakfast	20	33.3	24	17.1
	Lunch	20	33.3	44	31.4
	Dinner	20	33.3	72	51.4
	Total	60	100.0	140	100.0
Usual meal type	High fat meal	0	0.0	4	2.9
	High carbohydrate meal	0	0.0	8	5.7
	High protein meal	12	20.0	4	2.9
	Balanced meal	16	26.7	64	45.7
	Light meal	32	53.3	60	42.9
	Total	60	100.0	140	100.0
Duration between dinner and bedtime	< 30 min	12	20.0	20	14.3
	30 min - 1 hr	24	40.0	80	57.1
	1-2 hrs	24	40.0	40	28.6
	Total	60	100.0	140	100.0

Table 4.4: illustrates that in the second trimester, 60% of respondents eat 5-6 meals per day, while in the third trimester, 62.9% consume 3-4 meals daily. The majority of respondents skip meals, with 93.3% skipping in the second trimester and 71.4% in the third. Nausea and vomiting, being the most frequent reason for skipping meals. In third trimester fatigue is another more common reason for skipping meals (34.3%). During the second trimester, breakfast, lunch, and dinner are skipped in equally, but in the third trimester, dinner is most often skipped (51.4%). Respondents mostly eat balanced or light meals and typically wait 30 minutes to an hour between dinner and bedtime.

Table 4.5: Frequency of consuming foods leading to gastric acidity

		2nd Trimester		**3rd Trimester**	
		n	**%**	**n**	**%**
Spicy / Acidic food frequency	Daily	8	13.3	56	40.0
	Several times a week	48	80.0	56	40.0
	Largely	4	6.7	12	8.6
	Never	0	0.0	16	11.4
	Total	60	100.0	140	100.0
Frequency of consuming processed or fast foods	Daily	0	0.0	4	3
	Several times a week	32	53.3	20	14
	Once a week	4	6.7	32	23
	Rarely	24	40.0	56	40
	Never	0	0.0	28	20
	Total	60	100.0	140	100.0
Foods responsible for triggering GERD	High fat meal	8	13.3	20	14.3
	Spicy food	28	46.7	64	45.7
	Acidic food	4	6.7	20	14.3
	Large portions	12	20.0	24	17.1
	Others	8	13.3	12	8.6
	Total	60	100.0	140	100.0

Table 4.5: indicates that in the second trimester, 13.3% of respondents consume spicy or acidic foods daily, rising to 40% in the third trimester. The majority eat these foods several times a week in both trimesters. Most respondents rarely consume processed or fast foods, with spicy foods being the main trigger for GERD symptoms.

Table 4.6: Trimester and symptoms of GERD

Symptoms		2nd Trimester		3rd Trimester	
		n	%	n	%
Heartburn	Yes	60	100.0	140	100.0
	No	0	0.0	0	0.0
	Total	60	100.0	140	100.0
Acid reflux	Yes	60	100.0	140	100.0
	No	0	0.0	0	0.0
	Total	60	100.0	140	100.0
Frequency of symptoms	Daily	44	73.3	36	25.7
	2-3 times a week	16	26.7	92	65.7
	Weekly	0	0.0	12	8.6
	Total	60	100.0	140	100.0
Onset of symptom	Morning	36	60.0	44	31.4
	Afternoon	4	6.7	28	20.0
	Evening	4	6.7	28	20.0
	During sleep	16	26.7	40	28.6
	Total	60	100.0	140	100.0

Table 4.6: illustrates that all respondents report experiencing heartburn and acid reflux in both trimesters, with 73.3% experiencing daily symptoms in the second trimester, and 65.7% having them 2-3 times a week in the third trimester. The onset of symptoms varies, with many reporting them in the morning in second trimester, but during sleep in third trimester, indicating that GERD symptoms may worsen at night during the later stages of pregnancy.

Table 4.7: Occurrence of symptoms associated with GERD

GERD associated symptoms		2nd Trimester		3rd Trimester	
		n	%	n	%
Chest pain	Yes	40	66.7	100	71.4
	No	20	33.3	40	28.6
	Total	60	100.0	140	100.0
Excessive burping / bloating	Yes	48	80.0	92	65.7
	No	12	20.0	48	34.3
	Total	60	100.0	140	100.0
Severity of symptoms	Mild	4	6.7	4	2.9
	Moderate	36	60.0	104	74.3
	Severe	20	33.3	32	22.9
	Total	60	100.0	140	100.0
Severity of interference of GERD with daily activities	Not at all	0	0.0	0	0.0
	Slightly	32	53.3	12	8.6
	Moderately	20	33.4	88	62.8
	Significantly	16	13.3	40	28.6

	Total	60	100.0	140	100.0
Sleep trouble GERD	Yes	52	86.7	104	74.3
	No	8	13.3	36	25.7
	Total	60	100.0	140	100.0

Table 4.7: illustrates that chest pain and excessive burping/bloating are common. Chest pain is more prevalent in the third trimester (71.4%) while excessive burping / bloating is more common in second trimester (80%). Most respondents describe their symptoms as moderate, though in some cases the symptoms are severe. The interference of GERD with daily activities also increases, with 28.6% reporting significant interference in the third trimester. Difficulty sleeping due to GERD is also frequently reported.

DISCUSSION

A recent investigation into the "**Association between dietary habits and gastro-oesophageal/ symptoms during pregnancy in Kashmir**" involved 200 participants across multiple hospitals. The study's random sampling method yielded a predominantly young adult population, with 54% of respondents between 25-30 years old and 26% between 30-35 years old. Notably, 20% of participants had a family history of GERD, and 26% experienced symptoms before pregnancy, suggesting a possible connection between pre-pregnancy GERD and pregnancy-related symptoms.

The study revealed that meal frequency varied across trimesters, with 60% of participants consuming 5-6 meals daily in the second trimester and 62.9% eating 3-4 meals daily in the third trimester. Meal skipping was common, particularly in the second trimester (93.3%), often due to nausea and vomiting. Dinner was the most frequently skipped meal in the third trimester (51.4%). Despite experiencing GERD symptoms, many participants continued to consume trigger foods, such as fried or fatty foods, spicy/acidic foods, and caffeinated drinks. All participants reported GERD symptoms, including heartburn, acid reflux, chest pain, and excessive burping. Symptoms were more frequent in the second trimester, with 73.3% of participants experiencing them daily. The study highlights the need for awareness about dietary habits and GERD symptoms during pregnancy, particularly in regions like Kashmir.

Result

Majority of the respondents i.e. 60% in the second trimester eat 5-6 meals per day, while in the third trimester, 62% consume 3-4 meals daily. The majority of the respondents skips meals, with 83.3% skipping in the second trimester and 71.4% in the third. Additionally in the second trimester, 13.3% of respondents consume spicy or acidic food daily, rising to 40% in third trimester. Also it shows that all respondents report experiencing heartburn and acid reflux in both trimesters, with 73.3% experiencing daily symptoms in the second trimester, and 65.7% having them 2-3 times a week in the third trimester. Moreover, it reveals that the chest pain and excessive bloating are also common.

Conclusion

It was found that higher proportion of respondents continued to consume dietary triggers such as fried foods and carbonated beverages. The carbonated drink consumption was found to reach a peak in the second trimester however it declined in the third trimester as symptoms worsened. Meal skipping was common, driven mainly by nausea and fatigue, with dinner being the most frequently omitted meal in the third trimester. Spicy and acidic foods were often consumed, significantly correlating with the reported GERD symptoms, particularly heartburn and acid reflux.

CONCLUSION

According to the research, a substantial number of participants' experienced GERD symptoms, yet many continued to eat foods that triggered these symptoms, such as fried foods and carbonated drinks. Interestingly, consumption of carbonated beverages was highest during the second trimester, but decreased in the third trimester as symptoms intensified. The study also found that skipping meals was a common practice, primarily due to nausea and fatigue, with dinner being the most frequently skipped meal in the third trimester. Furthermore, the consumption of spicy and acidic foods was linked to an increase in GER symptoms, including heartburn and acid reflux.

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