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Research Article

Prevalence and predictors of gastroesophageal reflux disease in pregnant women and its effects on quality of life and pregnancy outcomes

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Abstract

Introduction: Pregnancy is considered a risk factor for Gastroesophageal Reflux (GERD). However, studies on GERD during pregnancy are rare in Korea. We aimed to evaluate the efficacy and clinical outcomes of GERD in late pregnancy in Korea.

Methods: Data from a total of 94 pregnant women in the second or third trimester at the SMG-SNU Boramae Medical Center for prenatal testing were analyzed in this study. The GERD questionnaire and Quality of Life in Reflux and Dyspepsia questionnaire were used to diagnose GERD and Quality of Life (QoL). Obstetric delivery records were utilized for pregnancy outcomes.

Results: Approximately 30 percent (30%) of pregnant women had GERD. The incidence of GERD during pregnancy was higher in pregnant women with a history of GERD (p=0.041) or low Body Mass Index (BMI) (p=0.036). However, the incidence of GERD during pregnancy did not increase in proportion to the weight gain. QoL was significantly different between pregnant women with and without GERD: emotional stress (p=0.014), sleep problems (p=0.015), food/drink problems (p=0.004), and vitality (p=0.029). There was no significant difference in pregnancy outcomes between the two groups.

Conclusion: This study shows that pregnant women with GERD and low BMI tend to present with GERD symptoms during pregnancy. GERD adversely affects the QoL of pregnant women.

Abbreviations

GERD: Gastroesophageal Reflux Disease; QoL: Quality of Life; LES: Lower Esophageal Sphincter; BMI: Body Mass Index; GerdQ: GERD Questionnaire; QOLRAD: Quality of Life in Reflux and Dyspepsia questionnaire

Introduction

In accordance with the new Montreal criteria, Gastroesophageal Reflux Disease (GERD) is classified as a disease that is related to troublesome symptoms and/or complications because of reflux of stomach contents into the esophagus [1]. The prevalence of GERD in the general population has rapidly increased in Korea over the last 20 years. With weekly heartburn or acid regurgitation, it has been reported to be 3.4%–7.9% in Korea [2]. It is known that the prevalence of GERD in Western countries is higher than that in Korea, and studies in Western countries that have represented the issue of GERD symptoms in pregnancy show a prevalence rate of approximately 30%–80% [3]. Pregnancy is widely recognized as a risk factor for GERD [4,5]. Several mechanisms of pathogenesis have been proposed to be attributed to the occurrence of GERD during pregnancy [4,5]. Increased intra-abdominal pressure and sex hormones

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during pregnancy are known to lower Lower Esophageal Sphincter (LES) pressure [3]. Known risk factors for GERD are multiparity, gestational age, past history of GERD, and family history of GERD. However, weight gain during pregnancy has not been considered a risk factor for GERD; obesity in women (Body Mass Index [BMI] >25) outside of pregnancy is a known risk factor. Knudsen, in 1995, showed that older maternal age and GERD had a positive correlation [3]. However, these studies were not based on validated questionnaires, and some of the results differed from those of other studies.

Pregnant women in the second or third trimester with GERD have significantly impaired quality of life (QoL). Symptoms such as sleep disturbance, decreased vitality, impaired physical functioning, and emotional distress can be observed in pregnant women with GERD [3]. However, studies on GERD in pregnancy are rare in Korea. Therefore, in this study, we aimed to evaluate the effects and clinical outcomes of GERD in late pregnancy in Korea.

Materials and methods

Ninety-four pregnant women in their second or third trimester of pregnancy were recruited for the prenatal test from the SNU-SMG Boramae Medical Center. They received two types of self-administered questionnaires: the GERD Questionnaire (GerdQ) and Quality of Life in Reflux and Dyspepsia questionnaire (QOLRAD). This study was approved by the ethics committee of the SMG-SNU Boramae Medical Center and was conducted in accordance with the guidelines of the Helsinki declaration (L-2012-465). The exclusion criteria included the following: those who did not agree with the consent, those who were below 20 years of age, and those who had pregnant diabetes mellitus or eclampsia and pre-eclampsia.

The GerdQ was used to diagnose GERD. The GerdQ comprises four predictors of GERD: (1) heartburn and regurgitation (symptoms of GERD, Montreal definition); (2) sleep disturbance; (3) use of medication (predictors of GERD, DIAMOND study), and (4) epigastric pain and nausea. (1) and (2) are positive predictors. (3) and (4) are negative predictors. The participants recorded their symptoms over the past week in the GerdQ. For positive predictors, points 0–3 were recorded while for the negative predictors, points 3–0 (reversed order) were recorded accordingly. The GerdQ score was recorded by summing each score, and it ranged from 0 to 18. Participants with a GerdQ score of 8 or higher were diagnosed with GERD [6].

The QOLRAD was used to evaluate the QoL of participants with GERD. The QOLRAD questionnaire comprised five components: emotional well-being, physical and social functioning, sleep, vitality, and nutrition.

Statistical analyses

Continuous variables were expressed as means and standard deviations. The t-test was used to compare the continuous variables. Chi-square or Fisher's exact tests were used to compare categorical variables, as appropriate. Two-sided p values less than 0.05, were considered statistically significant. Analyses were conducted using the statistical software package SPSS 19.0 (PSS Inc., Chicago, IL, USA).

Results

Patient characteristics

There were no significant differences between the GERD and non-GERD groups in terms of mean age, gravidity, education, and trimester (Table 1).

Of the 94 pregnant women, 28 were diagnosed with GERD. The prevalence of GERD in late pregnancy is 29.7%. GERD was more prevalent in the third trimester (32%) than in the second trimester (22%) (Table 2). Of the patients with GERD, five used H2 receptor antagonists. However, none of the patients had used proton pump inhibitors (PPIs), which are the most effective for the treatment of GERD.

Predictors of GERD showed a statistically significant difference with respect to the BMI before pregnancy (p=0.036) and past history of GERD (p=0.041). However, the other predictors did not show a statistically significant difference (Table 3).

GERD in pregnancy did not influence pregnancy outcomes (Table 4). However, some contents of QoL showed a statistically significant difference with respect to the emotion (0.019), sleep (0.015), food intake (0.005), and vitality (0.005) in pregnant women with GERD (Table 4).

Table 1: Baseline characteristics of the included participants with and without GERD.

		GERD (+) (n=28)	GERD (-) (n=66)	p-value
Age		32±3.61	33.94±4.20	0.100
Gravidity	Primigravid	6 (21%)	24 (36%)	0.155
	Multigravida	22 (79%)	42 (64%)	
Education	University	20 (77%)	53 (85%)	0.330
	High school	6 (23%)	9 (15%)	
Trimester	Second	5 (18%)	18 (27%)	0.331
	Third	23 (82%)	48 (73%)	

GERD: Gastroesophageal Reflux Disease

Table 2: Prevalence of GERD in pregnant women

	Prevalence
Total (n=94)	28 (29.7%)
Second trimester (n=23)	5 (22%)
Third trimester (n=71)	23 (32%)

Table 3: GerdQ of pregnant women with and without GERD.

Predictors		GERD (+)	GERD (-)	p-value
Pre-pregnancy BMI (kg/m^2)		19.97±1.90	21.04±2.82	0.036
Pre-partum BMI (kg/m^2)		25.29±2.29	25.96±3.05	0.333
Increase of BW (%)		27.02±8.47	23.7±8.82	0.117
Past history of GERD before pregnancy		7(25%)	6(9%)	0.041
Fetal sex	M	11(46%)	28(45%)	0.955
	F	13(54%)	34(55%)	

The pre-pregnancy BMI was calculated based on height and weight at 12 weeks before pregnancy

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Table 4: Clinical outcomes and QoL of pregnant women with and without GERD.

		GERD (+)	GERD (-)	p-value
Outcomes				
Birth weight		3.11±0.42	3.16±0.39	0.602
Apgar score	1 min	7.58±1.29	7.95±0.52	0.058
	5 min	8.75±0.85	8.94±0.35	0.149
Pre-term birth		1(1.6%)	3(11.5%)	0.107
Gestational age at partum		38.80±1.21	38.80±1.40	0.993
QoL				
Emotion		5.00	5.69	0.019
Sleep		3.68	4.45	0.015
Food/drink		4.84	5.58	0.005
Social		5.53	5.80	0.304
Vitality		4.44	5.29	0.005

QoL: Quality of Life
We used 2500-g as cut-off point of low birth weight

Discussion

In this study, the effects and clinical outcomes of GERD in late pregnancy were evaluated in Korea. The prevalence of GERD in late pregnancy was 29.7%, which was much higher than that in the general population in Korea. This prevalence is higher than that reported in studies conducted in other countries. The prevalence of GERD in the third trimester (32%) was higher than that in the second trimester (22%). It is thought that increased sex hormone-like progesterone and estrogen affect LES pressure, and intra-abdominal pressure is higher in the third trimester. Therefore, there appears to be an increased probability of developing GERD in advanced pregnancies [3,7].

Several previous studies have shown a positive correlation between pre-pregnancy BMI and GERD in pregnancy [3]. However, there was no positive correlation between the two predictive factors in this study. Perhaps it resulted from a small number of subjects in this study, although we could carefully anticipate its causes as follows: Women with low pre-pregnancy BMI might be more vulnerable to increased abdominal pressure in a short time. Moreover, they might have a lower threshold for GERD symptoms because they rarely experienced GERD symptoms before the high BMI group. GERD symptoms were influenced by maternal age and parity in previous studies [3], although we did not find a relationship between GERD and these symptoms in this study. Otherwise, estimated predictive factors such as the sex of baby, percentage of increased weight during pregnancy, and pre-partum BMI were not related to GERD in pregnancy.

The QoL of patients with advanced pregnancy with GERD was considerably reduced in this study. Aspects of sleep, vitality, emotional well-being, eating, and drinking were impaired in the presence of GERD. However, the physical and social functioning aspects were not statistically different between the two groups.

Poor QoL is known to affect the overall health of the fetus and mother [3]. Therefore, it is very important to manage GERD symptoms during pregnancy to improve the health of the fetus and mother. However, similar to other studies, GERD did not affect fetuses' birth weight, Apgar score, gestational age, or preterm birth [8].

Generally, the step-up approach is used for the treatment of GERD during pregnancy. If the symptoms are not severe, lifestyle changes and the use of antacids are used as first-line therapy. Histamine-2 receptor antagonists and PPIs are used in cases of failure of first-line therapy [9]. PPIs are the most efficacious drugs for the treatment of GERD. However, PPIs are rarely used as a treatment for GERD during pregnancy. In our study, only 5 of 28 pregnant women with GERD (18%) received medication, although these did not include PPIs. The advantage of PPI may surpass the potential risks to the mother and fetus [3]. Bjorn, et al. reported that the use of PPIs during the first trimester of pregnancy does not affect major birth defects [10-12]. Therefore, PPIs are recommended for pregnant women with severe symptomatic GERD.

This study has some limitations. First, because of the small number of sample size, the validity of a study can be weakened. Second, the single-center study might have a possible selection bias. However, we have plans to compensate this limitation by increasing sample size and by including other multi-center study.

In conclusion, this study shows that the prevalence of GERD in late pregnancy is high in Korea and is associated with poor QoL in pregnant women. However, most pregnant women with GERD symptoms do not receive adequate medication. These findings should arouse doctors' attention to the problem, which can lead to a change in the management and cognition of GERD in pregnancy.

Authors contributions

Concept and design: D.S.L. and J.W.K.; Supervision - K.L.L. and J.W.K.; Resources and Materials- D.S.L., K.L.L., and B.G.K.; Data Collection and/or Processing - D.S.L., J.W.K., and B.G.K.; Analysis and/or Interpretation - D.S.L. and J.W.K.; Literature Search - D.S.L., B.G.K., and K.L.L.; Writing Manuscript - D.S.L. and B.G.K.; Critical Reviews - K.L.L. and J.W.K.

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