Incidences of irritable bowel syndrome and its subtypes in patients with polycystic ovary syndrome

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Abstract

Aim: We aimed to compare the prevalence of irritable bowel syndrome (IBS) and its subtypes in patients with polycystic ovary syndrome (PCOS) and in healthy women. Material and Method: Fifty-four patients who referred to Endocrinology, Gynecology and Internal Medicine outpatient clinics of Harran University, Medical Faculty, and 53 healthy women were enrolled this study between September 2015 and March 2016. The incidence of IBS and IBS subtypes [according to predominance of diarrhea (IBS-D), constipation (IBS-C), and alternating (IBS-A)] in PCOS patients were compared with controls that matched age, sex and body mass index (BMI) criteria. For the diagnoses of PCOS and IBS, revised 2003 Rotterdam criteria and Roma III criteria were used, respectively. Results: IBS observed in 21 patients with PCOS (39%) and in 10 healthy women (19%). IBS is found significantly higher in PCOS patients than in the controls (p = 0.022). However, IBS-C is the most common subtype both in PCOS patients and in controls. Discussion: We showed IBS and IBS-C subtype were increased in women with PCOS. Therefore, we speculated that both IBS and PCOS might be releated with similar etiologic factors.

Keywords

Irritable Bowel Syndrome; Polycystic Ovary Syndrome; Incidence

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Introduction

Irritable bowel syndrome (IBS) is a common non-life threatening functional intestinal disorder that has significant negative consequences in terms of the quality of life and health-related costs. It is characterized by chronic abdominal pain and defecation disorder without the presence of any organic or biochemical impairment [1], with a reported prevalence of 10 to 15% in Western countries [2,3]. In the US, it is more common in women than in men.[4] The proposed risk factors include female gender, use of estrogen, prolonged gastroenteritis, antibiotic using, anxiety and depression, obesity, poor living conditions, and high educational level [5].

Polycystic ovary syndrome (PCOS) is the most common endocrinologic disorder in women with reproductive age group [6], and its prevalence is 7 to 10% [7]. Primary signs of PCOS include irregular menstrual bleeding, presence of multipl periferic cysts in the ovaries, and clinical and/or biochemical hyperandrogenism [8]. Chronic anovulation, characterized by oligomenorrhea (less than 9 menstruations per year) or amenorrhea, is a common finding in patients with PCOS. The short-term consequences of anovulatory cycles include abnormal uterine bleeding and infertility, while increased endometrial cancer risk may observe in long-term [9]. Anovulation is thought to result from hyperandrogenism, which it is associated with hyperinsulinemia and obesity [10-12].

Some risk factors and prevalence of these two disorders are similar. However, they are related with significant economical impacts on countries. Thus, we aimed firstly to assess the frequencies of IBS and its subtypes in patients with PCOS and in controls.

Material and Method

Fifty-four women with PCOS, attending to the Gynecology and Endocrinology outpatient unit, were included in this study between September 2015 and March 2016 in the Harran University, Medical Faculty, Şanlıurfa, Turkey. Women in the same age group and healthy, attending to the Internal Medicine outpatient unit, were served as control group. The study protocol was approved by the Ethics Committee of Harran University, and all patients participating the study provided written informed consent.

Detailed medical history and complete physical examination of all patients were obtained. However, all patients' age, height, weight, BMI, educational status, place of residence, employment status, cigarette smoking, alcohol and medication use were recorded.

Rotterdam criteria (2003) were used for the diagnosis of PCOS. Accordingly, PCOS has defined as the presence of at least 2 of the 3 following criteria: 1) irregular menses, 2) signs of clinical and/or biochemical hyperandrogenism, and 3) polycystic ovaries in ultrasound examination [13]. IBS diagnosis was made using Rome III criteria, and the sub-types of IBS were determined: 1) diarrhea predominant (IBS-D), 2) constipation predominant (IBS-C), 3) alternating IBS (IBS-A) [14].

Exclusion criteria included that the presence of chronic disease (such as diabetes, hypertension, hypo-hyper thyroidism), pregnancy, lactation, perimenopausal status, active infection, and < 16 years of age.

Study data were analyzed using SPSS (Statistical Package for Social Sciences for Windows) 20.0. The descriptive statistical data were expressed as mean ± standard deviation for parametric data and as maximum and median for non-parametric data. The normal distribution of the data was tested using Kolmogorov-Smirnov test. For categorical variables, between group comparisons were performed with Pearson's chi-square test. A p value of less than 0.05 was considered statistically significant.

Table 1. Age, BMI, and place of residence in study groups

	PCOS (n = 54)	Control Group (n = 53)	Total (n = 107)	p
Age, (year)	24.92 ± 6.22	26.91 ± 8.27	25.9 ± 7.34	> 0.05
BMI, (kg/m²)	25.51 ± 4.33	24.01 ± 4.82	24.73 ± 4.62	> 0.05
Urban Area	49 (90.7%)	50 (94.3%)	99 (92.5%)	> 0.05
Rural Area	5 (9.3%)	3 (6.6%)	8 (7.5%)	> 0.05

PCOS: polycystic ovary syndrome, BMI: body mass index

Results

Total of the 112 patients were included to the study, but 5 women were excluded due to the overt diabetes, prolactinoma, TSH suppression, pregnancy, and elevated inflammatory markers.

At the comparison of PCOS group and the controls regarding to the age, BMI, and place of residency, BMI was higher in PCOS subjects, although the difference was statistically unsignificant. IBS found in the 28 patients from urban areas (26.2%), while 3 patients had IBS (37.5%) from the rural areas. Despite the higher occurrence of IBS in those residing in rural areas as compared to those residing in urban areas, this difference was not statistically significant (Table 1).

In PCOS group, 17 patients were using medication, commonly oral contraceptives. 10 patients (9.3%) were current smokers, and no patient had a history of alcohol use. In control group, there was no history of medication, alcohol, and cigarette smoking.

Sixty women (56.1%) were housewifes, 34 individuals (31.8%) were students, and 13 women (12.1%) were working. IBS was observed in 2, 9 and 20 women (15.4%, 26.5%, 33.3%) that they are working, students, and housewifes, respectively. Although IBS was seen lesser rate in the working women, the statistical difference in women including all employment status was unsignificant.

General IBS rates were 38.9% in the PCOS group, 18.9% in the controls, and 29% in overall group of 107 subjects. IBS found with a higher rate in PCOS patients, this comparison was statistically significant (p = 0.022, Figure 1). Regarding to the subtypes of IBS, IBS-C subtype was more common in PCOS patients (Figure 2) than in the controls, but there were no statistically significance between two groups (p > 0.05).

Discussion

PCOS is the common endocrinological disorder in women with reproductive age group. Although its etiology has not been fully clarified, genetic and environmental factors have been implicated [15]. Currently, there are three main diagnostic classification systems that have been proposed for the diagnosis of

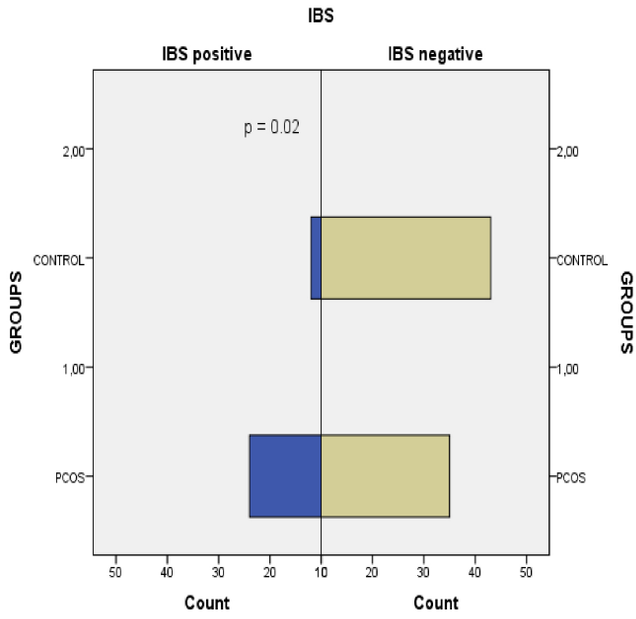

Figure 1. Frequency of IBS in PCOS and non-PCOS groups

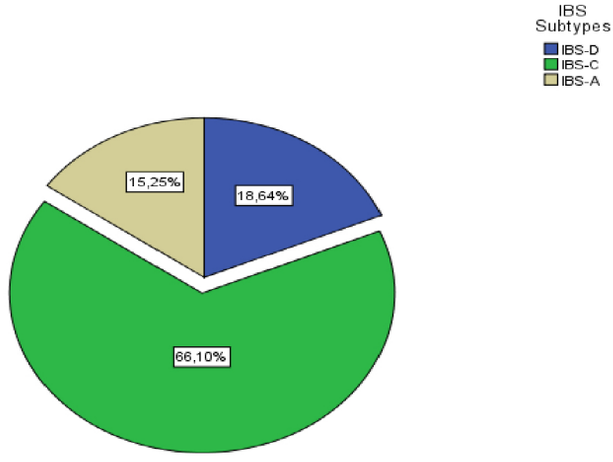

Figure 2. Frequency of IBS subtypes in patients with PCOS

PCOS: NIH, AE-PCOS Society and Rotterdam criteria. In many studies examining PCOS frequency using all these classifications, highest frequency of PCOS was found when Rotterdam criteria were used (6.1%, 15.3%, and 19.9%, respectively) [16,17]. Because of this known information, we used Rotterdam 2003 criteria in this study.

IBS is a functional intestinal disorder characterized by abdominal pain, bloating, and alteration in defecation patterns. Generally it associates with some somatic comorbidities (e.g. pain syndromes, overactive bladder, migraine) and psychiatric disorders (anxiety, depression) [18]. Yılmaz et al. showed that decreased prevalence of IBS was reported in individuals over 50 years of age [19]. Özden et al. have reported that their most of patients with IBS (46.9%) were between 25 and 55 years of age [20]. Although we did not include peri- and postmenopausal women to our study and we did not compare different age groups, the patients' mean age was 24.9 ± 6.2 in the PCOS group.

Although the relationship between the IBS and female gender, being in reproductive age group, and estrogen using has been well documented, studies researching the association between PCOS and IBS frequency are limited to only one study [21]. Mathur et al. have shown that IBS prevalence was higher in women with PCOS (41.7%). Similarly, we found increased IBS frequency in PCOS patients (38.9%) than in the demographically-matched controls (18.9%) in the larger group than in the study of Mathur et al. [21]. Although we used the different criteria for PCOS and IBS diagnoses (revised 2003 Rotterdam criteria and Roma III criteria, respectively) from Mathur et al. (NIH and Roma I, respectively), our results suggest the previous study. Additionally, we separated the patients for classification of IBS (IBS-D, IBS-C, IBS-A) as distinct from Mathur et al.

Sirmans et al. have showed women with PCOS are more likely to be obese [16], and in a recent study, Enck et al. demonstrated that abdominal obesity is a significant risk factor for IBS [18]. So obesity has been thought major risk factor for both diseases. We did not evaluate abdominal obesity in study patients, nevertheless, we found that BMI was slightly higher in PCOS group.

The prevalence of IBS has reported 8.23% in a meta-analysis which 4 studies from Turkey have shown the IBS prevalence is 10.4% [22]. Özden et al. have demonstrated a population based study, 32 different provinces from Turkey, that patients were divided into two groups based on the presence of gastrointestinal system (GIS) symptoms or non-GIS symptoms at the presentation of IBS. They found IBS rate as 41% in the patients presenting with GIS, and the most of IBS diagnosed patients were female gender [20]. In our study, total IBS frequency was found 29%, which was higher than literature (12.4%) [19]. We thought this difference might have resulted from the fact that our study population consisted of solely female gender and also from the regional differences.

Keshtelia et al. studied the distribution of IBS sub-types in Iran, they found that IBS-C, IBS-D, and IBS-A were 34%, 20%, and 19%, respectively [23]. Özden et al. showed the incidence of IBS-C, IBS-D, and IBS-A were 64%, 4%, and 32%, respectively, in Turkish people [20]. We found the total incidence of IBS-C, IBS-D, and IBS-A were 68%, 16%, and 16%, respectively. In this regard, our results are compatible with previous reports [21]. Additionally we studied firstly the frequency of IBS subtypes in women with and without PCOS, and we identified IBS-C is the most common subtype (66.1%) in PCOS patients. This association has not been previously described. We thought hormonal alterations might play a role in the occurrence of IBS symptoms.

In some studies detecting IBS prevalence in rural and urban areas has shown the controversial results. Zhang et al. have reported the IBS prevalence was 6.5% in China, with no significant difference between rural and urban areas [24]. Qumseya et al. have found lower prevalence of IBS in urban areas (27% to 34%) of Palestinian [25]. Conversely, some researchers observed higher prevalence of IBS in urban areas of Italy and of Turkey [16,26]. In the present study, the overall prevalence of IBS in patients residing in urban and rural areas were 26.2% and 37.5%, respectively. Although the higher rate of IBS was seen in subjects from rural areas, this rate was not statistically significant and probably due to the different study population and low sample size.

The role of female hormones in the pathophysiology of IBS is not defined clearly, despite some authors have demonstrated

that IBS symptoms change during the menstrual bleeding periods in women [27,28]. Additionally, it was thought that endometriosis is associated with increased risk of IBS [29].

This study has some limitations, these include small sample size and lack of hormonal analyses of women that including to determine if there are hormonal differences in PCOS with and without IBS.

Conclusion

In conclusion, the prevelance of IBS and its IBS-C subtype appeared to be more common in women with PCOS than in controls. The understanding of increased IBS and IBS-C subtype in this subcategory of women is not clear. Further studies with larger sample size are needed for warranted to shed further light on these associations.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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