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Original Research Article

A study on prevalence of obesity and menstrual disturbances in women with polycystic ovary syndrome

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is a common endocrine disorder in women of reproductive age and is often linked with obesity and menstrual irregularities.
Methods: A community based cross-sectional study was conducted among 300 women with PCOS using a structured questionnaire to collect demographic data, treatment status, weight factors and menstrual characteristics. BMI categorized participants as normal weight, overweight or obese and menstrual patterns such as irregular cycles, painful periods and heavy bleeding were recorded.
Results: The findings showed a high prevalence of overweight and obesity, with many participants experiencing menstrual disturbances.
Conclusions: A strong association was observed between higher BMI and increased menstrual irregularities, highlighting the importance of early diagnosis, lifestyle modification and weight management in improving reproductive health outcomes in women with PCOS.

Keywords: Polycystic ovary syndrome, Obesity, Menstrual cycle disturbances.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a multi-system endocrine disorder that involves a variety of reproductive, metabolic and hormonal abnormalities, the interaction of which can lead to a variety of health and quality of life issues for affected women.

Obesity, especially central adiposity, significantly contributes to the pathophysiology of PCOS by intensifying insulin resistance, resulting in hyperinsulinemia and heightened ovarian androgen production, which exacerbates reproductive and metabolic disorders. Insulin resistance and excessive adiposity impair the hypothalamic–pituitary–ovarian axis, leading to menstrual irregularities and anovulation.[1] Additionally, obesity exacerbates clinical manifestations including hirsutism, infertility, and metabolic syndrome, signifying its function as both a comorbidity and a disease modifier in PCOS.[2] A systematic review indicated that women with PCOS exhibit a markedly elevated risk of being overweight and obese, underscoring the robust correlation between these conditions.

Research indicates that a significant percentage of individuals with PCOS are obese, exacerbating metabolic complications.[3] A large nationwide multicentric study found that the prevalence of PCOS in India ranges from 7.2% (NIH criteria) to 19.6% (Rotterdam criteria), which is a big public health problem. In this population, about 43.2% of women with PCOS were also obese, which shows how strongly these two conditions are linked.[4] A systematic review and meta-analysis of Indian studies estimated the pooled prevalence of PCOS to be

approximately 11.33%, further corroborating its significant prevalence among Indian women.[5]

Menstrual irregularities are prevalent clinical manifestations of PCOS, primarily arising from chronic anovulation and hormonal dysregulation. These disturbances usually consist of oligomenorrhea, amenorrhea, and irregular menstrual cycles, resulting from disrupted folliculogenesis and modified hypothalamic–pituitary–ovarian axis function. Hyperandrogenism and insulin resistance exacerbate disrupted ovulatory cycles, consequently elevating the incidence and severity of menstrual irregularities in affected women.[1] Menstrual irregularities affect about 70-80% of women with PCOS around the world, making them one of the most important signs of the disorder. Research consistently indicates that oligomenorrhea is the most common abnormality, succeeded by amenorrhea and dysfunctional uterine bleeding.[6] Obese women with PCOS often have more severe menstrual problems, which suggests a strong link between metabolic problems and reproductive problems.[3] A multicentric study in India found that more than 80% of women with PCOS had some kind of menstrual irregularity, with oligomenorrhea being the most common type.[4] Another Indian study found that about 72-85% of women with PCOS had irregular menstrual cycles. Moreover, community-based studies in India have indicated that menstrual irregularities frequently represent one of the initial symptoms leading to the diagnosis of PCOS, especially among adolescents and young women.[7]

So, the present study aims to assess the prevalence of obesity and menstrual disturbances among women with PCOS and to evaluate the influence of obesity on menstrual irregularities in this population.

METHODS

The present study was conducted in Guntur, Andhra Pradesh, India among female students from SIMS college of pharmacy and women from the general community, cross sectional study over a period of six months, from June 2025 to December 2025. A total of 300 women diagnosed with PCOS were included in the study population. Participants were selected based on clearly defined inclusion and exclusion criteria. Women aged between 13 and 45 years, belonging to the reproductive age group, with a confirmed diagnosis of PCOS and who were willing to provide complete information regarding their menstrual history and obesity-related factors were included in the study.

On the other hand, women below 13 years of age, pregnant women, lactating mothers, and those with known endocrine disorders other than PCOS, such as thyroid disorders and Cushing's syndrome, were excluded. Additionally, women who were on medications that could influence body weight, such as steroids, or those who had received hormonal therapy affecting the menstrual cycle within the last three months were also excluded from the study. The methodology was carried out in three phases. Initially, eligible patients were selected based on the inclusion and exclusion criteria. This was followed by data collection, where detailed information was obtained from the participants, including demographic characteristics such as age, marital status, occupation, height, weight, and any associated medical conditions. A structured PCOS questionnaire was administered, focusing specifically on two major domains: obesity and menstrual cycle patterns. Finally, the collected data were systematically analysed to assess the prevalence of obesity and menstrual irregularities among women with PCOS.

RESULTS

The age distribution of the participants was categorized into three groups: 14-20 years, 21-30 years, and 31-45 years. Among the participants, the majority belonged to the 21-30 years age group, accounting for 205 subjects (68%). The 14-20 years age group included 68 subjects (23%), while the 31-45 years age group had the least number of participants with 27 subjects (9%). The descriptive analysis indicates that most of the study population falls within the reproductive age group of 21-30 years, which is the age range where PCOS is commonly diagnosed and reported (Table 1).

Table 1: Descriptive analysis of age group (n=300).

S. no.	Age group (years)	Frequency
1.	14-20	68
2.	21-30	205
3.	31-45	27

The descriptive analysis of Body Mass Index (BMI) distribution among the study participants. It shows that 37% (n=111) of the participants fall under the normal weight category, representing the largest proportion of the sample.

Table 2: Association between BMI and menstrual pattern.

S. no.	BMI category	Irregular cycle	Regular cycle
1.	Normal weight	59	52
2.	Over weight	83	7
3.	Obese	97	2

Meanwhile, 30% (n=90) are categorized as overweight, and 33% (n=99) are classified as obese. The findings indicate that a considerable proportion of the study population is either overweight or obese (63% combined), suggesting a high prevalence of increased body weight among the participants compared to those with normal BMI (Figure 1). The descriptive analysis of menstrual cycle patterns among the study participants. It shows that the majority of participants, 80% (n=240), reported having

irregular menstrual cycles, while only 20% (n=60) had regular cycles.

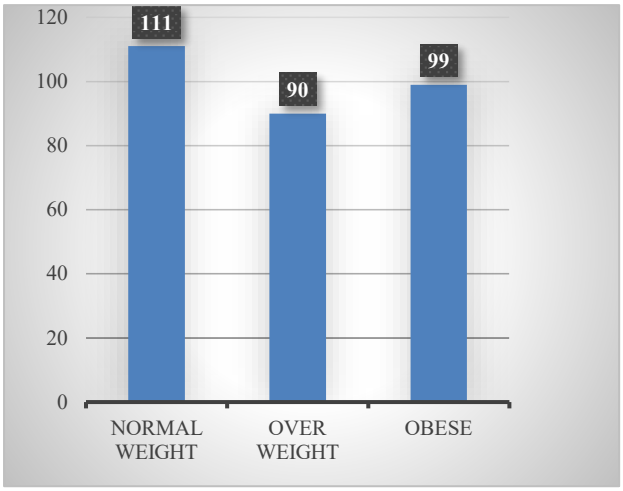

Figure 1: Bar diagram showing descriptive analysis of BMI.

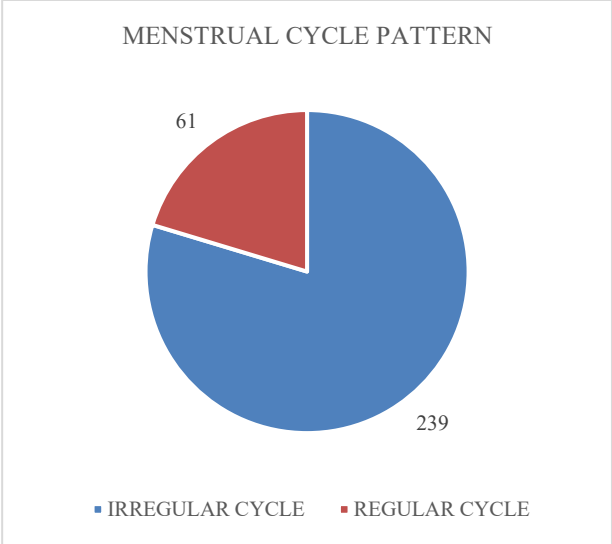

Figure 2: Pie chart showing descriptive analysis of menstrual pattern.

This indicates that irregular menstrual patterns are highly prevalent in the study population. The findings suggest a significant occurrence of menstrual irregularities among participants, which may be associated with underlying conditions such as PCOS and related metabolic factors (Figure 2). The bar diagram represents the association between BMI and menstrual cycle pattern among the study participants. Among women with normal weight, 59 had irregular cycles while 52 had regular cycles, showing a relatively balanced distribution. In the overweight category, a markedly higher number of participants (83) reported irregular cycles compared to only 7 with regular cycles. Similarly, among obese participants, 97 had irregular cycles whereas only 2 reported regular cycles. These findings demonstrate that menstrual irregularities increase with rising BMI, indicating a strong association between higher body mass index and the prevalence of irregular menstrual cycles (Table 2, Figure 3).

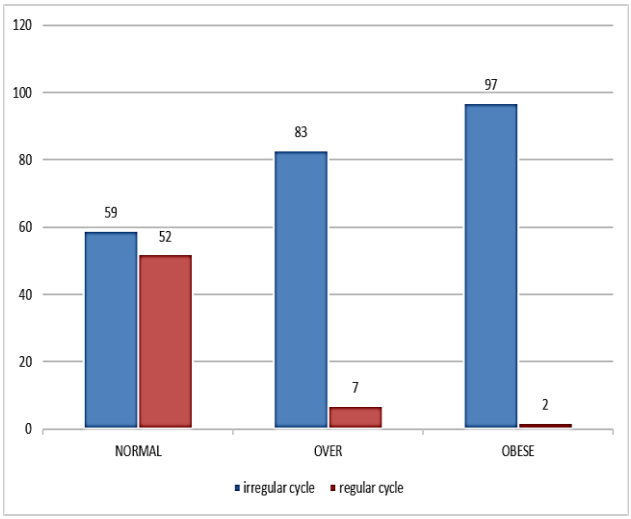

Figure 3: Bar diagrams representing association between BMI and menstrual cycle pattern.

DISCUSSION

The present study demonstrates a high prevalence of overweight and obesity (63%) among women with PCOS, along with a substantial proportion of menstrual irregularities (80%). These findings are in agreement with previous studies which have consistently reported that metabolic abnormalities and reproductive dysfunction coexist in women with PCOS and significantly influence disease severity.[3-7] In the current study, the majority of participants belonged to the 21-30 years age group, which aligns with earlier research indicating that PCOS is most commonly diagnosed during the early reproductive years, when clinical manifestations such as menstrual disturbances become more evident.[3-8] This similarity supports the demographic distribution observed in the present study. A key finding of this study is the strong association between increasing BMI and menstrual irregularities. It was observed that the prevalence of irregular menstrual cycles increased progressively from normal-weight to obese individuals. Similar observations have been reported in previous studies, where obesity was found to aggravate insulin resistance and hyperinsulinemia, leading to increased androgen production and disruption of normal ovulatory cycles.[9,10] Strelec et al also reported that obese women with PCOS exhibit more pronounced metabolic and hormonal disturbances compared to non-obese women, further supporting the present findings.[9]

The prevalence of menstrual irregularities (80%) observed in this study is comparable with earlier reports indicating that approximately 70-85% of women with PCOS experience irregular menstrual cycles, including oligomenorrhea and amenorrhea.[8-11] Furthermore, recent

studies have shown that the severity of menstrual dysfunction is closely associated with worsening metabolic and hormonal profiles in PCOS patients.[12]

The association between obesity and menstrual disturbances observed in this study can be explained by underlying pathophysiological mechanisms. Previous studies have demonstrated that excess adipose tissue contributes to altered endocrine function through increased peripheral estrogen production, insulin resistance, and chronic inflammation, all of which impair follicular development and ovulation.[10-13] Additionally, insulin resistance has been identified as a central factor linking obesity with reproductive dysfunction in PCOS.[7-13]

The present findings are also supported by population-based and cross-sectional studies, which have shown that women with higher BMI are more likely to experience severe clinical manifestations of PCOS, including menstrual irregularities and metabolic complications.[3-14] A recent study among young women also reported a high prevalence of PCOS associated with menstrual disturbances and lifestyle-related risk factors, further supporting the trends observed in the current study.[14] Furthermore, previous interventional studies have demonstrated that even modest weight reduction through lifestyle modification can significantly improve menstrual regularity and ovulatory function in women with PCOS, highlighting the clinical importance of early weight management strategies.[15]

Overall, the findings of this study reinforce the evidence that obesity plays a significant role in the development and severity of menstrual irregularities in women with PCOS. The observed increase in irregular cycles with rising BMI highlights the importance of early lifestyle interventions, including weight management, dietary modification and physical activity. Such interventions may help improve both metabolic and reproductive outcomes in women with PCOS. However, further longitudinal studies are required to establish causal relationships and evaluate long-term outcomes.

CONCLUSION

This study shows that obesity is very common among women with PCOS, and most participants experienced irregular menstrual cycles. It was clearly observed that as body weight increases, menstrual irregularities also increase. Women who were overweight and obese had a much higher number of irregular cycles compared to those with normal weight. This indicates that higher BMI plays an important role in worsening PCOS symptoms. Therefore, maintaining a healthy body weight through proper diet and regular exercise is important for managing PCOS and improving menstrual regularity. Early diagnosis and lifestyle changes can help reduce complications and improve overall health in women with PCOS.

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