Original Research Article

EVALUATION OF OBESITY IN FEMALES WITH ABNORMAL MENSTRUAL CYCLE

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Abstract: *The study aimed to evaluate obesity in females with abnormal menstrual cycles. A cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Fatimah Memorial Hospital, Lahore, from 1st May 2018 to 30th October 2018. A total of 144 women with abnormal mensuration were included in the study. Patients' data, including age, marital status, and duration of menstrual irregularity, were noted. All the women were assessed for obesity, i.e., BMI equal to or greater than 27 kg/m2. The mean age of patients was 27.645±2.84 years. The average BMI was 25.365±3.41 kg/m2. 28 (19.4%) patients were obese, and 53 (36.8%) were married. 23 (18.9%) obese patients were 26-35 years old. 26 (19.7%) obese subjects had a parity of 0-3 times. Obesity was directly associated with irregularities in the menstrual cycle.*

Keywords: Obesity, Menstruation, Menstruation Cycle, Fertile Women

Introduction

Obesity has become a health issue worldwide. On average, approximately 20% of women in their reproductive years are obese (Jaacks et al., 2019). Obesity has been observed to be associated with abnormal menstruation; hence obsess women are more likely to experience infertility. According to the data, metabolic syndrome was the leading cause of this irregularity.

Obesity in women leads to hypothalamic-pituitary-gonadal axis dysfunction resulting in ovulatory dysfunction. Excess adipose tissue can disrupt the binding of estrogen and globulin, leading to infertility. Several methods have been invented for weight loss in overweight women, but their impact on female infertility is still disputable (Hunter et al., 2021).

A recent large sample study was conducted on 600 obese women experiencing infertility. The women underwent weight loss intervention which showed that the live births did not differ from the control group. However, weight loss before fertilization reduces the complications in pregnancy (Bond et al., 2020). In Zurawiecka et al., it was reported that menstrual abnormality was more common in subjects with high BMI and waist circumference. The patients who lost and gained weight had a high risk of a disturbed menstrual cycle after adjusting age, smoking status, BMI, alcohol addiction, physical exercise, income, calorie intake, metabolic syndrome, menarche, stress, and parity (Żurawiecka and

Wronka, 2021). The findings of both studies are contradictory.

This study was conducted to evaluate obesity in females with abnormal menstrual cycles.

Methodology

A cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Fatimah Memorial Hospital, Lahore, from 1st May 2018 to 30th October 2018. A total of 144 women with abnormal mensuration were included in the study. Pregnant patients, patients with a history of genital tract surgery, patients undergoing chemotherapy or radiation, and those on oral contraceptive pills were excluded from the study. All the patients provided their consent to become a part of the study. The ethical board of the hospital approved the study design.

Patients' data, including age, marital status, and duration of menstrual irregularity, were noted. All the women were assessed for obesity, i.e., BMI equal to or greater than 27 kg/m^2.

All the data was evaluated by SPSS version 22. Quantitative variables like age, BMI, parity, weight, height, and duration of irregularity were presented by mean and standard deviation. Qualitative variables like obesity and marital status were presented as frequency and percentage. Age, parity, marital status, and duration of irregularity were stratified to analyze

their association with obesity. Chi-squared test was performed after stratification. A less than or equal to 0.05 probability value was considered statistically significant.

Results

The mean age of patients was 27.645±2.84 years. The average BMI was 25.365±3.41 kg/m2 (Table I). 28 (19.4%) patients were obese, and 53 (36.8%) were married. 23 (18.9%) obese patients were 26-35 years old. 26 (19.7%) obese subjects had a parity of 0-3 times (Table II).

Table I: Patients' Demographic characteristics

Demographics	Mean ± SD
Age (years)	27.645±2.84
Parity	0.666±1.25
Duration of irregularity(months)	3.930±1.55
Weight (Kg)	63.055±6.90
Height (m)	1.580±0.07
BMI (Kg/m^2)	25.365±3.41
Menarche	14.5 ± 1.2

Table II: Stratification of obesity with respect to age, parity, duration of irregularity, and marital status

Variable	Obesity		P value
	Yes	No	
Age			
16-25	5 (22.7%)	17 (77.3%)	0.673
26-35	23 (18.9%)	99 (81.1%9	
Parity			
0-3	26 (19.7%)	106 (80.3%)	0.800
>3	2 (16.7%)	10 (83.3%)	
Duration of irregularity (months)			
1-3	12 (20.3%)	47 (79.7%)	0.821
>3	16 (18.8%)	69 (81.2%)	
Marital status			
Unmarried	15 (16.5%)	76 (83.5%)	0.239
Married	13 (24.5%)	40 (75.5%)	

Discussion

Infertility and ovulatory dysfunction are common in obese women due to hypothalamic-pituitary-gonadal axis dysfunction. This study was conducted to evaluate obesity in women experiencing abnormal menstruation.

The average age of our study participants was 27.645±2.84 years. Ameade and Garti (Ameade and Garti, 2016) and Yamamoto et al. (Yamamoto et al., 2009) also reported a mean age of 23 ± 5.07 years and 19.4 years, respectively, showing patients from peak reproductive years. The menarche in the present study was 14.5 ± 1.2 years. These results are consistent with Adefye et al. (Adefuye et al., 2010) and Hussein et al. (Hossain et al., 2011).

In our study, 19.4% of participants were obese. Mustaqeem et al. also reported a similar frequency of 30.4% in women experiencing abnormal menstruation cycles (Mustaqeem et al., 2015). However, Abraham et al. showed a very low rate of 4% obese women (Abraham et al., 2018). This significant difference was noted due to the small sample size in this study. In Xinyu, a 6.5% obesity rate was noted, and the abnormal menstrual cycle was more common in obese women (38.7%) (Zhou and Yang, 2020).

Wei et al., it was found that obese women had a two times greater chance of having an abnormality in the menstrual cycle (Wei et al., 2009). 26% of the obese women had irregularity, and only 14% of the women with normal BMI had irregular menstruation. In Memon et al., 70% of obese women had menstrual abnormalities compared to 29% of non-obese women proving an association between obesity and menstruation (Memon et al., 2022).

Our study has some limitations. Due to the study design, we could not report the cause-effect relationship between changes in weight and menstrual abnormalities. Additionally, we did not categorize the patterns and severity of these irregularities.

Conclusion

Obesity was directly associated with irregularities in the menstrual cycle.

Conflict of interest

The authors declared an absence of conflict of interest.

References

Abraham, M., Lissa, J., and Williams, S. (2018). A Correlation Study to Assess the Relationship of Menstrual Irregularities, body Mass Index (BMI) and Hemoglobin (HB) level among Adolescent Girls in Selected College at Mysuru. *International Journal of Nursing Education and Research* **6**, 101-106.

Adefuye, P., Odusoga, O., Adefuye, B., and Akindele, R. (2010). Age at menarche and menstrual pattern in secondary schoolgirls in Sagamu. *Nigerian Journal of Clinical Practice* **13**.

Ameade, E. P. K., and Garti, H. A. (2016). Age at menarche and factors that influence it: a study among female university students in Tamale, Northern Ghana. *PloS one* **11**, e0155310.

Bond, R. T., Nachef, A., Adam, C., Couturier, M., Kadoch, I.-J., Lapensée, L., Bleau, G., and Godbout, A. (2020). Obesity and infertility: a metabolic assessment strategy to improve pregnancy rate. *Journal of Reproduction & Infertility* **21**, 34.

Hossain, M. G., Sabiruzzaman, M., Islam, S., Hisyam, R. Z., Lestrel, P. E., and Kamarul, T. (2011). Influence of anthropometric measures and socio-demographic factors on menstrual pain and irregular menstrual cycles among university students in Bangladesh. *Anthropological Science* **119**, 239-246.

Hunter, E., Avenell, A., Maheshwari, A., Stadler, G., and Best, D. (2021). The effectiveness of weight-loss lifestyle interventions for improving fertility in women and men with overweight or obesity and infertility: a systematic review update of evidence from randomized controlled trials. *Obesity Reviews* **22**, e13325.

Jaacks, L. M., Vandevijvere, S., Pan, A., McGowan, C. J., Wallace, C., Imamura, F., Mozaffarian, D., Swinburn, B., and Ezzati, M. (2019). The obesity transition: stages of the global epidemic. *The lancet Diabetes & endocrinology* **7**, 231-240.

Memon, E., Aamir, F., Waheed, A., Gehani, K., Fariha, S., and Naqvi, S. (2022). Association of menstrual irregularity with obesity. *Rawal Medical Journal* **47**, 589-589.

Mustaqeem, M., Sadullah, S., Waqar, W., Farooq, M., Khan, A., and Fraz, T. (2015). Obesity with irregular menstrual cycle in young girls. *Mymensingh medical journal: MMJ* **24**, 161-167.

Wei, S., Schmidt, M. D., Dwyer, T., Norman, R. J., and Venn, A. J. (2009). Obesity and menstrual irregularity: associations with SHBG, testosterone, and insulin. *Obesity* **17**, 1070-1076.

Yamamoto, K., Okazaki, A., Sakamoto, Y., and Funatsu, M. (2009). The relationship between premenstrual symptoms, menstrual pain, irregular menstrual cycles, and psychosocial stress among Japanese college students. *Journal of physiological anthropology* **28**, 129-136.

Zhou, X., and Yang, X. (2020). Association between obesity and oligomenorrhea or irregular menstruation in Chinese women of childbearing age: a cross-sectional study. *Gynecological Endocrinology* **36**, 1101-1105.

Żurawiecka, M., and Wronka, I. (2021). Association between age at menarche and body mass index, waist circumference, waist to hip ratio, and waist to height ratio in adult women. *American Journal of Human Biology* **33**, e23523.