Frequency of Abnormal Menstrual Cycles Associated with Raised BMI.

Bakht Bilal[1], Ali Mustafa[2] and Fatima Anwaar Khan[3]
[1]House Officer, Services Hospital Lahore,
Email: bilal94x@gmail.com
Ph. # 0306-8431264
[2]House Officer, Services hospital Lahore,
Email: acheema94@gmail.com
Ph. # 0321-7634444
[3]Women Medical Officer, BHU Mirzeka Tehsil Minchinabad,
Email: Fatima.khan102@yahoo.com
Ph. # 0324-8421244

Abstract:

Objective: The main aim of this study was to find the frequency of menstrual cycle abnormalities which were associated with higher BMI.

Study Design: It is a cross sectional type of study.

Place and Duration of study: This study was carried out in a duration of 9 months from August 2018 to April 2019 in Gynecology and Obstetrics department of Services hospital Lahore.

Materials and Methods: A total of 100 cases which were in fertile group i.e. Age greater than 12 years were included in this study. Inclusion criteria was to have menstrual abnormalities for at least last 3 cycles. Exclusion criteria included patients with bleeding tendencies, abnormalities of uterus and hormonal abnormalities. Body mass index of every patient was calculated and the patients who had BMI greater than $25 kg/m^2$ were labeled as high. Informed consent was taken from all the patients or their relatives. A pre-designed proforma was used to collect the data. Ethical committee approval was taken.

Results: There were 100 patients selected for the study. Mean age in our study was 20.21 ± 4.57 years. The mean time period for there were menstrual abnormalities was 7.21 ± 2.34 months. 32% of the patients had raised BMI. 64% were taking treatment for this. The patients who had age of menarche greater than 14 years, incidence of increased BMI was much higher seen in 16 (47. 06%) of cases. Patients who had previous treatment for delayed menstruation also had increased BMI which was seen in 23 (40. 35%) cases.

Conclusion: There is high association of menstrual abnormalities with Raised BMI and other factors like delayed menarche and prior treatment for it increases the incidence significantly.

Keywords: Menarche, BMI, Menstrual cycle

Introduction: Menstrual cycle problems are a major health issues which is common in teenage girls. These problems have a high incidence in developing countries. Patient can have a major stress issues with these abnormalities along with other psychological, physical and gynecological issues.

Multiple factors which can be major or minor can lead to these abnormalities. Minor issues can be mild stress disorder and major can be severe diseases which include structural anomalies of uterus, fallopian tube and ovaries along with hormonal disturbances. Adults and adolescents both can be affected by some of these factors. The major cause of fear associated with these anomalies is the abnormality of reproduction cycle. High prevalence is seen in developed countries because of life style modification, dietary habits and increased obesity which can lead collectively affect menstrual cycle.

One of the greatest risk factor involved in menstrual cycle irregularities is obesity which can either directly affect the cycle of it may show an underlying pathology like hormonal abnormalities or polycystic ovarian disease.

Objective: The main aim of this study was to find the frequency of menstrual cycle abnormalities which were associated with higher BMI.

Materials and Methods: A total of 100 cases which were in fertile group i.e. Age greater than 12 years were included in this study. Inclusion criteria was to have menstrual abnormalities for at least last 3 cycles. Exclusion criteria included patients with bleeding tendencies, abnormalities of uterus and hormonal abnormalities. Body mass index of every patient was calculated and the patients who had BMI greater than 25kg/m2 were labeled as high. Informed consent was taken from all the patients or their relatives. A pre-designed proforma was used to collect the data. Ethical committee approval was taken.

Results: There were 100 patients selected for the study. Mean age in our study was 20.21 ± 4.57 years. The mean time period for there were menstrual abnormalities was 7.21 ± 2.34 months. 32% of the patients had raised BMI. 64% were

taking treatment for this. The patients who had age of menarche greater than 14 years, incidence of increased BMI was much higher seen in 16 (47. 06%) of cases. Patients who had previous treatment for delayed menstruation also had increased BMI which was seen in 23 (40. 35%) cases.

Table 1: Demographics

	Mean	Range
Age (years)	20.21±4.57	14-32
BMI (kg/m^2)	24.23±3.39	16-34
Duration of abnormal menstruation (months)	7.21±2.34	1-10

Table 2: Raised BMI and age of menarche (n= 100)

Age of menarche (years)	Raised BMI		Total
	Yes	No	
>14	16 (47.06%)	18 (52.94%)	34 (100%)
14 or less	16 (24.24%)	50 (75.76%)	66 (100%)
Total	**32 (32%)**	**68 (68%)**	**100 (100%)**

p= 0.01

Table 3: Raised BMI and h/o prior treatment (n= 100)

H/o Prior treatment	Raised BMI		Total
	Yes	No	
Yes	23 (40.35%)	34 (59.65%)	57 (100%)
No	09 (20.93%)	34 (79.07%)	43 (100%)
Total	**32 (32%)**	**68 (68%)**	**100 (100%)**

p= 0.03

Discussion: Puberty is a dynamic phase of life and it affects greatly in sense of sexual, physical emotional changes. Beginning at the age of 13 and ending at 19 years of age. During this phase multiple changes occur in body including onset of menstrual phase and problems related to it.

These abnormalities have been found to be linked with increase body weight and BMI. In our study, increased BMI was found in 32% of cases. The results are in accordance with previous studies. A survey conducted by ACOG showed that raised BMI was seen in 30 to 47% of cases.

The patients who had age of menarche greater than 14 years, incidence of increased BMI was much higher seen in 16 (47. 06%) of cases. Patients who had previous treatment for delayed menstruation also had increased BMI which was seen in 23 (40. 35%) cases. Similar results were shown by Dars S et al where he showed that higher age of menarche had increased risk of menstrual abnormalities. Mean age of menarche was 12.92 ± 1.41 years in our study. Other studies showed that in cases where patients were taking medication for delayed menarche, had raised BMI.

Conclusion: There is high association of menstrual abnormalities with Raised BMI and other factors like delayed menarche and prior treatment for it increases the incidence significantly.

REFERENCES:

1. American Academy of Pediatrics, American College of Obstetricians Gynecologists. Menstruation in girls and adolescents: using the menstrual cycle as a vital sign. Pediatrics 2006;118(5):2245-50.

2. Day FR, Elks CE, Murray A, Ong KK, Perry JR. Puberty timing associated with diabetes, cardiovascular disease and also diverse health outcomes in men and women: the UK Biobank study. Sci Rep. 2015;5:1-12. DOI:10.1038/srep11208

3. Palm-Fischbacher S, Ehlert U. Dispositional resilience as a moderator of the relationship between chronic stress and irregular menstrual cycle. J Psychosom Obstet Gynaecol. 2014;35(2):42-50.

4. Kim MJ, Lim NK, Choi YM, Kim JJ, Hwang KR, Chae SJ, et al. Prevalence of metabolic syndrome is higher among non-obese PCOS women with hyperandrogenism and menstrual irregularity in Korea. PLoS One. 2014;9(6):e99252.

5. Lee SS, Kim DH, Nam GE, Nam HY, Kim YE, Lee SH, et al. Association between metabolic syndrome and menstrual irregularity in middle-aged Korean women. Korean J Fam Med. 2016;37(1):31-6.

6. Brewer CJ, Balen AH. The adverse effects of obesity on conception and implantation. Reproduction 2010;140(3):347-64.

7. Seif MW, Diamond K, Nickkho-Amiry M. Obesity and menstrual disorders. Best Pract Res Clin Obstet Gynaecol. 2015;29:516-27.

8. Lim SW, Ahn JH, Lee JA, Kim DH, Seo JH, Lim JS. Early menarche is associated with metabolic syndrome and insulin resistance in premenopausal Korean women. Eur J Pediatr. 2016;175(1):97–104.

9. Kuokkanen S, Polotsky AJ, Chosich J, Bradford AP, Jasinska A, Phang T, et al. Corpus luteum as a novel target of weight changes that contribute to impaired female reproductive physiology and function. Syst Biol Reprod Med. 2016;62(4):227-42.

10. Han K, Ko Y, Park YG, Park JB. Associations between the periodontal disease in women before menopause and menstrual cycle irregularity: the 2010-2012 Korea National Health and Nutrition Examination Survey. Medicine (Baltimore). 2016;95(6):e2791.

11. Stracciolini A, Quinn BJ, Geminiani E, Kinney S, McCrystal T, Owen M, et al. Body mass index and menstrual patterns in dancers. Clin Pediatr (Phila). 2017;56(1):49-54.

12. Lim JS, Choi YJ, Kim SK, Huh BW, Lee EJ, Huh KB. Optimal waist circumference cutoff value based on insulin resistance and visceral obesity in Koreans with type 2 diabetes. Diabetes Metab J. 2015 Jun;39(3):253-63.

13. Samara-Boustani D, Colmenares A, Elie C, Dabbas M, Beltrand J, Caron V, et al. High prevalence of hirsutism and menstrual disorders in obese adolescent girls and adolescent girls with type 1 diabetes mellitus despite different hormonal profiles. Eur J Endocrinol 2012;166(2):307-16.

14. Prentice P, Viner RM. Pubertal timing and adult obesity and cardiometabolic risk in women and men: a systematic review and meta-analysis. Int J Obes (Lond). 2013;37(8):1036-43.

15. Delara M, Woodgate RL. Psychological distress and its correlates among university students: a cross-sectional study. J Pediatr Adolesc Gynecol. 2015;28(4):240-4.

16. ACOG Committee on Practice Bulletins—Gynecology. ACOG Practice Bulletin No. 108: polycystic ovary syndrome. Obstet Gynecol. 2009;114(4):936-49.

17. Dars S, Sayed K, Yousufzai Z. Relationship of menstrual irregularities to BMI and nutritional status in adolescent girls. Pak J Med Sci. 2014;30(1):141–4.

18. Nagma S, Kapoor G, Bharti R, Batra A, Batra A, Aggarwal A, et al. To evaluate the effect of perceived stress on menstrual function. J Clin Diagn Res. 2015;9(3):QC01–3.

19. Aryeetey R, Ashinyo A, Adjuik M. Age of Menarche among basic level school girls in Madina, Accra. Afr J Reprod Health. 2011;15(3):103-10.

20. Seth B, Arora S, Singh R. Association of obesity with hormonal imbalance in infertility: a cross-sectional study in north Indian women. Indian J Clin Biochem. 2013;28(4):342–7.