

MENSTRUAL CYCLE LENGTH IN FEMALES WITH ENDOMETRIOSIS

Sadia Nazir¹, Rida Khan², Attiqa Khalid¹, Gulfam Ahmad², Khalid P Ione²

¹Department of Physiology, Lahore Medical and Dental College, University of Health Sciences, Lahore - Pakistan

²Department of Physiology and Cell Biology, University of Health Sciences, Lahore - Pakistan

ABSTRACT

Objectives; To find an association between menstrual cycle length in females with endometriosis and healthy females.

Material and methods: A cases control study was conducted at tertiary care teaching hospitals of Lahore Pakistan. This study comprised of 50 married females aged between 20-40 years, laparoscopically diagnosed with endometriosis as cases and 50 married healthy females of same age group as control group. Females with conditions like leiomyomas and carcinomas or any other co-morbid condition were excluded. After informed consent, a structured questionnaire was filled up by both cases and control. The association between menstrual cycle length and endometriosis was compared by Pearson's correlation. The results were expressed as r , and statistically significant was set as p -value less than 0.05.

Results: A moderately strong correlation ($r = 0.662$, $p = 0.000^*$) with positive trend was obtained between short menstrual cycle length (<28 days) in females with endometriosis as compared to healthy females.

Conclusion: There is strong association between short menstrual cycle length and endometriosis.

Keywords: Endometriosis, menstrual cycle, length.

This article may be cited as: Nazir S, Khan R, Ahmed G, Khalid. Menstrual cycle length in females with Endometriosis. *J Med Sci* 2019 Oct;27(4):356-58.

INTRODUCTION

Endometriosis is a debilitating disease of unknown etiology. Females with this disorder presented with several complaints such as abnormal menstrual cycle length, pelvic pain, dysmenorrhea and longer duration of menstruation. Endometriosis is a perplex disorder less known about its causes, risk factors and its prevalence. Disease is described by implantation of endometrial tissues at abnormal position. It is assumed that endometriosis is relatively common disease, a study conducted in Pakistan shows that the frequency of this disease in Pakistan is 20.2% in females that have primary complaint of infertility¹. This prevalence rate is similar with findings from other studies conducted on different populations^{2,3}. Presentation of condition may be severe pelvic pain, menorrhagia, dysmenorrhea and infertility. It is an important public health problem and a lead-

ing cause of hysterectomy. Thus, endometriosis is exorbitant in effecting livability of females, the cost of health care and its financial burden in the workplace⁴. Several reports have been described the diversity of risk factors for disease. Females with endometriosis may be taller and slimmer than healthy females. Menstrual characteristics that are associated with disease are painful menstruation, early onset of menstruation and short menstrual cycle^{5,6}. It is believed that lifestyle habits could increase or decrease the serum estrogen levels that have an effect on risk, such as exercise and smoking associated with lower risk and alcohol or caffeine consumption associated with higher risk^{7,8}. These risk factors seem to be consistent with prime importance of retrograde theory of menstruation other elements such as hormonal, genetic, immune and environmental factors are also found to be associated with the clearance and growth of endometrial tissue⁹. We proposed that tall stature, low weight, short menstrual cycle, dysmenorrhea, early menarche and infertility might be described by genetic predisposition.

Abnormal menstrual cycle was defined as one or more of the following: Menstrual cycle is said to be abnormal when duration of cycle less than 26 or more than 32 days; more than 8 days of menstrual bleeding or anovulatory cycle¹⁰. Length of menstrual cycle is an

Dr. Sadia Nazir (Corresponding Author)
Assistant Professor
Department of Physiology Lahore Medical and Dental College, University of Health Sciences, Lahore - Pakistan
E-mail: sadiamunir1980@hotmail.com
Cell: +92-321-4713384
Date Received: September 23, 2019
Date Revised: December 05, 2019
Date Accepted: December 20, 2019

important risk factor in development of disease. Shorter duration and long menstrual flow leads to increased risk of retrograde menstrual flow¹¹. Several studies showed the link between length of menstrual cycle and endometriosis. These studies revealed that females with shorter cycle have more probability to develop endometriosis as compared to longer cycle^{12,13}. The purpose of our study was that these menstrual cycle features especially menstrual cycle length possibly be used to escort the therapeutic and diagnostic plans of endometriosis in clinical practices. For instance, menstruation or ovulatory phase can be delayed by trying artificial menstrual cycle to manage the development or progression of endometriosis.

MATERIAL AND METHODS

The study was approved by Ethical review board of University of Health Sciences, Lahore-Pakistan. Study was conducted in tertiary care hospitals of Lahore, Pakistan. Study included 50 females laparoscopically diagnosed as cases of endometriosis, between ages of 20- 40 years and 50 healthy females of same age group. Females on any medication, fibroids, carcinomas, or other co morbid conditions were eliminated from the study. After taking written informed consent from all participants a complete medical history with general physical and systemic examination was done. A designed questionnaire contained menstrual details was filled in by participants. Data were analyzed by using IBM-SPSS version 20. Pearson's correlation was used to investigate the relationship between endometriosis and length of menstrual cycle. The correlation coefficient between the endometriosis and length of menstrual cycle is denoted by the *r* and its value varies between -1 and +1.

RESULT

The Pearson's correlation coefficient of endometriosis and length of menstrual cycle was 0.662, with a p-value of less than 0.000*. This *r* of 0.662 is moderate to strong correlation with a very high statistical significance ($p < 0.000^*$). Females with endometriosis had shorter menstrual cycle lengths <28 days as compared with females with menstrual cycle lengths > 28 days. There was a positive trend between probability of endometriosis and shorter menstrual cycle length (**p value=0.000***) (Table 1).

Table 1: Pearson's correlation between endometriosis and menstrual cycle length.

Pearson's correlation Coefficient with p- value	With Endometriosis
Menstrual cycle length	$r = 0.662^{**}$ $p = 0.000^*$

DISCUSSION

Endometriosis is a gynecological disease of unknown etiology identified by existence of endometrial tissue at sites other than the uterus. Due to delay in diagnosis patients suffer in multiple ways, such as persistent symptoms and corresponding deleterious influence on life quality. Moreover timely diagnosis of disease, identification of risk factors and appropriate modifications to prevent these risk factors and adequate timely management of disease may halt the progression of disease and adhesion formation that lead to infertility.

This study suggests that there is moderately strong correlation of endometriosis with menstrual cycle length. Females with endometriosis are having short menstrual cycle (< 28 days) as compare to healthy females (>28 days). Similar finding have been reported by several studies that menstrual cycle < 27 days associated with two fold increased risk of endometriosis^{14, 15}. The retrograde menstrual flow can be the explanation for these findings in which there is anatomical distribution of endometrial implants. Female with obstructive Mullerian tube abnormalities or inadequate corpus luteal functions are more prone to develop endometriosis. Abnormal functioning of luteum ascribe to insensitivity of ovary to ovulatory surge of luteinizing hormone. Katherine *et al.* concluded that in females with endometriosis there is a shorter interim between surge of luteinising hormone and the commencement of menstruation. So in females with short cycle there is potentially increased risk and frequency of retrograde flow of blood that leads to higher risk of endometriosis¹⁶. Longer cycle length affects the disease in contrary way. Several studies showed that local growth factors like insulin like growth factor1 (IGF 1) and vascular growth factors (VEGF) as well as sex steroid hormones enhance the growth of ectopic endometrial tissue. Shorter menstrual length is associated with increased levels of these hormones and growth factors^{17- 19}.

CONCLUSION

There is strong association between short menstrual cycle length and endometriosis.

Acknowledgements

We would like to thanks all participants of research. Thanks to PCSIR laboratory and Gynae department of Sir Ganga Ram hospital Lahore-Pakistan for technical facilitation.

REFERENCES

1. Rao SI, Siddiq S, Qadir SY, Sarfraz Z, Rana M. Endometriosis; prevalence of endometriosis on laparoscopy in subfertile women. Professional Med J 2019; 26(5):702-706.
2. Reid, R., Steel, A., Wardle, J. The prevalence of self-reported diagnosed endometriosis in the Australian population: results from a nationally-repre-

- sentative survey. BMC Res Notes, 2019; 12, 88.
3. Al-Jefout, M., Alnawaiseh, N., Yaghi, S., Alqaisi, A., Prevalence of Endometriosis and Its Symptoms among Young Jordanian Women with Chronic Pelvic Pain Refractory to Conventional Therapy. Journal of Obstetrics and Gynaecology Canada, 2018; 40 (2), 165-170.
4. Soliman AM, Yang H, Du EX. The direct and indirect costs associated with endometriosis: a systematic literature review. Hum Reprod. 2016;31:712–722
5. Han JY, Lee EJ, Jee BC, Kim SH. Menstrual characteristics in Korean women with endometriosis: a pilot study. ObstetGynecol Sci. 2018;61(1):142-146.
6. Shahbazi S, Shahrabi-Farahani M. Evaluation of the correlation between body mass index and endometriosis among Iranian fertile women. GynecolEndocrinol 2016;32:157–160.
7. Hemmert, R., Karen C. S., Willis, S., Peterson, C. M., Louis, G. B., et al. Modifiable life style factors and risk for incident endometriosis. Paediatr Perinat Epidemiol. 2019; 33:19–25.
8. Schliep, .C, Schisterman, EF, Mumford, SL. Caffeinated beverage intake and reproductive hormones among premenopausal women in the BioCycle Study. Am J ClinNutr. 2012; 95:488–497.
9. Shafirir AL, Farland LV, Shah DK, Harris HR, Kvaskoff M, Zondervan K, Missmer SA. Risk for and consequences of endometriosis: A critical epidemiologic review. Best Practice & Research Clinical Obstetrics & Gynaecology 2018; 51: 1-15.
10. Widmaier EP, Raff H, Strang KT. Vander's Human Physiology: The Mechanism of Body Function. 12th ed. New York: McGraw-Hill; 2010: 555-631.
11. Wei M, Cheng Y, Bu H, Zhao Y, Zhao W. Length of Menstrual Cycle and Risk of Endometriosis. A Meta-Analysis of 11 Case–Control Studies. Medicine. 2016; 95:1-6
12. Treloar SA, Bell TA, Nagle CM. Early menstrual characteristics associated with subsequent diagnosis of endometriosis. Am J ObstetGynecol, 2010; 202:534. e1-6.
13. Moini A, Malekzadeh F, Amirchaghmaghi E. Risk factors associated with endometriosis among infertile Iranian women. Arch Med Sci. 2013; 9:506–514.
14. Arumugam K, Lim J M H. Menstrual characteristics associated with endometriosis. BJOG. 2005; 104(8): 948-950.
15. Reed, Beverly G., and Bruce R. Carr. "The normal menstrual cycle and the control of ovulation." Endotext [Internet]. MDText. com, Inc., 2018.
16. Katherine S. Ruth, Robin N. Beaumont, Jessica Tyrrell, Samuel E. Jones, Marcus A. Tuke, Hanieh Yaghootkar, et al. Genetic evidence that lower circulating FSH levels lengthen menstrual cycle, increase age at menopause and impact female reproductive health, Human Reproduction, 2016; 31(2): 473–481
17. Farland L V, Mu1 F, Eliassen A H, Hankinson S E, Tworoger S S, Barbieri R L, Dowsett M, Pollak M N, Missmer S A. Menstrual Cycle Characteristics and Steroid Hormone, Prolactin, and Growth Factor Levels in Premenopausal Women Cancer Causes Control. 2017 ; 28(12): 1441–1452
18. Mumford SL, Steiner AZ, Pollack AZ, Perkins NJ, Filiberto AC, Albert PS, et al. The utility of menstrual cycle length as an indicator of cumulative hormonal exposure. The Journal of clinical endocrinology and metabolism. 2012; 97(10):1871–9.
19. Laisk T, Kukuškina V, Palmer D, Laber S, Chen CY, Ferreira T, Rahmioglu N, Zondervan K, Becker C, Smoller JW, Lippincott M. Large-scale meta-analysis highlights the hypothalamic–pituitary–gonadal axis in the genetic regulation of menstrual cycle length. Human molecular genetics. 2018 ;27(24):4323-32.

CONFLICT OF INTEREST: Authors declare no conflict of interest

GRANT SUPPORT AND FINANCIAL DISCLOSURE NIL

AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

- | | |
|------------------|--|
| Nazir S: | Conceived and designed the analysis, Collected the data, Contributed data or analysis tools, Performed the analysis, Wrote the paper |
| Khan R: | Contributed data or analysis tools. |
| Khalid A: | Performed the analysis. |
| Ahmad G: | Conceived and designed the analysis. |
| Lone KP: | Conceived and designed the analysis. |

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.