

Risk factors associated with irregular menstrual cycle among young women

Mubashir Zafar

Department of Public Health, College of Public Health, Imam Abdulrehman Bin Faisal University, Dammam, Kingdom of Saudi Arabia

Abstract

Background: Irregular menstrual cycle is common problem among young women (15–35 years). It is the major risk factor for sexually transmitted disease. The objective of this study is to determine the risk factors associated with irregular menstrual cycle among young women of age group 18–35 years. **Methodology:** Cross-sectional survey and 183 participants were selected through simple random sampling from the gynecology department of tertiary care hospital. Women whose age group was 18–35 years were included and structured validated questionnaire was used. Association between risk factors with irregular menstrual cycle was determined through logistic regression analysis. **Results:** Mean age of study participants was 24.5 (SD \pm 1.5) years. After adjustment of covariates the statistically significant association are women who have high parity (6–9 children) (OR 2.78, CI 1.96–8.07}, past medical history (OR 1.33, CI 1.38–2.92), used addicted substance (OR 5.41, CI 1.72–16.97), user of contraceptive (OR 1.21, CI 1.65–3.10), and family history of cancer (OR 3.61, CI 2.99–5.10). **Conclusion:** Women who have high parity, used addicted substance, and contraceptive users are the major determinants for irregular menstrual cycles. Health education and early identification and prompt treatment are the best solution for this important public issue.

Keywords: Cycle, menstruation, parity, sexual, women

Address for correspondence: Mubashir Zafar, Department of Public Health, College of Public Health, Imam Abdulrehman Bin Faisal University, Dammam, Kingdom of Saudi Arabia.

E-mail: researchmubshir@outlook.com


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INTRODUCTION

Menstruation is the physiological process in which there is monthly cycle of blood loss per vagina resulting from the breakdown of uterine lining when implantation of fertilized ovum does not occur.^[1] Normal menstrual cycle ranges from 22 to 36 days^[2] and normal menstrual loss is about 25 ml per day for 2–7 days per month.^[1]

Disorders of menstrual cycles are one of the most common reasons for women to attend their general

practitioner and a gynecologist. Although rarely life-threatening menstrual disorders can cause major social, psychological, and occupational upset.^[3] Irregular menstrual cycle is defined as periods that occur less than 21 days or more than 35 days apart, missing three or more periods in a row, menstrual flow that is much heavier or lighter than usual, periods that last longer than seven days, periods that are accompanied by pain, cramping, nausea, or vomiting, bleeding or spotting that happens between periods, after menopause or following sex.^[4] Common symptoms of an abnormal

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menstrual cycle include dysmenorrhea, that is pain during menstruation, oligomenorrhea, or menorrhagia, that is abnormal length of bleeding, abnormal quantity of blood flow, infertility, or abnormal cycle length or amenorrhea, that is absence of menstruation.^[5-7]

There are many risk factors of irregular menstrual cycle including age, smoking and alcohol, stress, hormonal imbalance, pregnancy, and contraception.^[8] A study was conducted in North Carolina on 3941 premenopausal women aged between 21 and 40 years who were not taking oral contraceptives and not currently pregnant or breastfeeding in which highest incidence of long and irregular cycles was seen after age 14 and was less common with advancing age.^[9]

A study was conducted in California on 408 women; results found that heavy smoking (at least 20 cigarettes per day) was associated with nearly four times the risk of abnormal cycle length.^[10] A study was conducted on 766 women age between 29 and 31 years which showed that long menstrual cycles were common among women who drank alcohol than among non-drinking women.^[11] A study was conducted in Johns Hopkins University on 166 college women which showed that women with a history of long cycles were more likely to have long cycles during the exam days or when in stress.^[12] According to a study published in *British Medical Journal*, the frequency of menstruation was reduced to once every three months in 196 women by continuous administration of oral contraceptive pills, Minilyn, for 84 days.^[13]

Irregular menstrual cycle is important factor of sexually transmitted disease. Women frequently visited to clinic for treatment which increases health care cost of patient. There is a need to explore the factors which led to irregular menstrual cycle to save the time and cost of treatment. The purpose of this study is to find out risk factors of irregular menstrual cycle such as age, stress, smoking and alcohol, hormonal imbalance, pregnancy, and contraception in women between age 18 and 35 years age group. The result of our study will help the health professional to investigate these kinds of problems and policy maker would make policy to prevent factors which leads to disorder of menstrual cycle.

OBJECTIVE

To determine risk factors associated with irregular menstrual cycle among young women of age group of 18–35 years.

METHODOLOGY

Operational definition

Menstruation cycle length was less than 21 days or more than 35 days, who were having severe pain during menstruation for more than three cycles or those having very less blood flow (less than two pads/tampons etc. on days of most heavy bleeding) or very severe blood flow (more than 4/5 pads/tampons etc on days of most heavy bleeding) or who were having absent cycles for more than two times in an year.

Study setting, study design, and sampling technique

This study was conducted in the Department of Gynecology and Obstetrics of tertiary care hospital in urban city. The number of patients who come in outpatients department is approximately 300–400 per day and number of beds in the ward is 200. It's a cross-sectional study and simple random technique was used to select the participants.

SAMPLE SELECTION

Inclusion criteria

The women aged 18–35 years, those having menorrhagia of more than two months duration, those having irregularities in menstrual cycle, and used any method of contraception were included.

Exclusion criteria

The patients who are pregnant and aged above 40 years were excluded. Also patients having any co-morbidity, that is hypertension, any thyroid disease, liver disorder or any clotting disturbances, and any uterine diseases, are excluded.

Independent and dependent variables

Age, ethnicity, educational level, occupational status, number of children, addiction of substance, use of contraceptive methods, menorrhagia of two or more months, age, and menstrual irregularities are the independent variables and dependent or outcome variable is irregular menstrual cycle.

Sample size

Sample size was calculated by World Health Organization health studies calculator and based on proportion of irregular menstrual cycle among women of age group 30–40 years reported by a previous study.^[14] It was estimated by using proportion of depression as 40% at confidence level 95% and bound of error 3%. A sample size of 183 was calculated by the formula.

Data collection procedure

The permission was taken from respective ward, time taken from each participants and interview was conducted of given time. Informed consent from each participant was taken before start of the interview.

Data collection tool

The study instrument was a validated questionnaire which comprised of two sections. Part 1 was related to the socio-demographic characteristics, part 2 related to menstrual-related problems and sexual history and contraceptive information. The questionnaire was prepared in English and translated to local language.

Data analysis

Data were double entered in Epi Data software version 1.3, through this missing values were cleaned and error rate was determined accordingly. Data analysis was performed using computer programmed SPSS version 16.0. Those variables which are quantitative were calculated as frequency and percentages. Logistic regression was run to determine association of outcome and independent variables.

Ethical consideration

The study was approved by the competent authority of department and permission was taken from the respective departments before start of data collection. Questions were asked after taking informed consent and taking part in this study is completely voluntary. The patient may skip any questions that they do not want to answer and are free to withdraw at any time. There were no specific benefits to the patients but it will help us to find the causes of menstrual irregularities in women and refer to treatment.

RESULTS

Table 1 shows socio-demographic characteristics of study participants. Mean of age of study participants was 24.5years. Most of the study participants were 30–40 years (53%) of age. 90.7% females were married out of which 69.3 % female got married early, age between 12 and 24 .57.9% of were illiterate, 78.7 % were housewives, 58.5% speak provincial languages (Sindhi, Punjabi, Pashto), 58.5% women admit addiction of smoking. 57.4% females give history of diseases. While 58.7% give insignificant surgical history. 65% of women complained menorrhagia for two or more months, 86.9% used 1–5 tampons, 63.9% with no skip cycles. Dysmenorrhea was common in 82.5% of women and 53% had ever used contraception.

Table 1: Socio-demographic characteristic of study participants

S.no	Characteristic	Frequencyn	Proportion%
1	Age (Mean ± SD)		24.5±1.5
	18-25y	97	53
	26-35y	86	47
2	Marital status		
	Married	166	90.7
	Unmarried	17	9.3
3	Age of marriage		
	5–10	115	69.3
	11–15	17	30.7
4	Education		
	Literate	77	42.1
	Illiterate	106	57.9
5	Occupation		
	Housewife	144	78.7
	Working women	39	21.3
6	Ever user of nicotine		
	Ever	107	58.5
	Never	76	41.5
7	Past medical and surgical history		
	Yes	112	57.1
	No	84	42.9
8	No of children		
	0–5	161	88
	6–9	22	12
9	Setting of delivery		
	Home based	37	23.12
	Facility based	123	76.87
10	Age of menarche		
	10–14 y	156	85.2
	15–17 y	27	14.8
11	Average days of menstrual cycle		
	21–35 days	116	65
	<21 days/> 35 days	64	35
12	Tampon used (per day)		
	2–5	159	86.9
	6–8	24	13.1
13	Monthly menstrual skip cycle		
	Yes	66	36.1
	No	117	63.9
14	Dysmenorrhea		
	Yes	156	85.2
	No	27	14.8
15	Ever user of contraceptive		
	Yes	97	53
	No	79	43.2

Table 2 shows the association of socio-demographic characteristics and abnormal menstrual cycle. The study participants who were married had more than one time abnormal menstrual cycle (COR 1.31, CI 1.01–3.84). Females who had C-section more than one time had irregular menstrual cycle (COR 1:1:53, CI 1.188–3.847). Results show women who used any contraceptive method have significant relation with irregular menstrual cycle (COR 141:1, CI 1.143–3.102). All other values were statistically insignificant. Those women who ever were user of nicotine had more than five times irregular menstrual cycle (COR 5.413, CI1.726–16.979).

Table 2: Association of sociodemographic characteristics and abnormal menstrual cycle (univariate)

S. No.	Characteristics	Crude odd ratio (COR)	Confidence interval (CI)
1.	Age (years)		
	18-25	0.83	0.39-1.77
	26-35	1	
2.	Marital status		
	Married	1.31	1.011-3.847
	Unmarried	1	
3.	Education		0.24-1.05
	Illiterate	0.509	
	Literate	1	
4.	Ever user of Nicotine		
	Yes	5.413	1.72-16.97
	No	1	
5.	No of children		
	6-9	2.78	0.99-8.07
	0-5	1	
6.	Past medical and surgical history		
	Yes	1.27	1.16-2.92
	No	1	
7.	Method of delivery of last child		
	C-section	1.53	1.18-12.53
	Normal vaginal	1	
8.	Setting of delivery		
	Home	0.74	0.26-2.12
	Facility based	1	
9.	Age of menarche		
	10-14 y	1.45	0.54-3.89
	15-17 y	1	
10.	Dysmenorrhea		
	Yes	0.40	0.12-1.28
	No	1	
15.	Ever user of contraceptive		
	Yes	1.41	1.14-3.10
	No	1	

Table 3: Association of socio-demographic characteristics and abnormal menstrual cycle (multivariate)

S. no.	Characteristics	Adjusted odd ratio (AOR)	Confidence interval (CI)
1.	Age (years)		
	18-25	0.78	0.35-1.75
	26-35	1	
2.	Marital status		
	Married	1.55	1.35-3.74
	Unmarried	1	
3.	Education		0.22-1.08
	Illiterate	0.64	
	Literate	1	
4.	Ever user of nicotine		
	Yes	7.21	4.72-10.97
	No	1	
5.	No of children		
	6-9	1.48	1.26-6.07
	0-5	1	
6.	Past medical and surgical history		
	Yes	0.22	0.15-2.92
	No	1	
7.	Method of delivery of last child		
	C-section	1.29	0.28-12.8
	Normal vaginal	1	
8.	Setting of delivery		
	Home based	0.65	0.51-2.18
	Facility based	1	
9.	Age of menarche		
	10-14 y	1.37	1.14-2.83
	15-17 y	1	
10.	Days of bleeding		
	11-15	1.25	0.98-2.16
	2-10	1	
11.	Dysmenorrhea		
	Yes	1.33	1.19-1.99
	No	1	
12.	Ever user of contraceptive		
	Yes	1.21	1.65-3.07
	No	1	

Table 3 shows the association of socio-demographic characteristics and abnormal menstrual cycle (multivariate). The study participants who were married had more than one time abnormal menstrual cycle (AOR 1.55, CI 1.35-3.74). Those women who ever used nicotine had more than seven times irregular menstrual cycle (AOR 7.21, CI 4.72-10.97), those women who had more than six children more than one times had irregular menstrual cycle (AOR 1.48, CI 1.26-6.07). Results show women who used any contraceptive method have significant relation with irregular menstrual cycle (AOR 1.21, CI 1.65-3.07). All other values were statistically insignificant.

DISCUSSION

Irregularity of menstrual cycle is one of the most common gynecological problems among women. The study found that married women, ever user of nicotine, women who

have high parity, and contraceptive user are the major risk factors for irregular menstrual cycle.[8,15] This study shows that female aged 30-40 years are among the majority of women complaining of menorrhagia, out of which half (53%) were of age 30-35 years, showing that menorrhagia occurring more in this age group. However mean age of this study participants was 24.5 years. The finding of this study has been supported by a study conducted in North Carolina on 3941 premenopausal women aged between 21 and 40 years, showing relation of irregular cycles with age (at age 21-25, 3%; at age 26-30, 14%; at age 31-37, 26%; at age 38-40, 31%)[9,16]. Approximately 58.5% of women admitted to be addicted to smoking, beetle nuts, or naswar, which showed that more than half of women with menorrhagia are having some kind of addiction or

nicotine users and so are more prone to develop menorrhagia, that is to have more than seven times irregular cycles (AOR 7.21, CI 4.72–10.97). This is also supported by a study conducted in California on 408 women, according to which heavy smoking in women is associated with nearly four times increased risk of abnormal menstrual cycles.[10,17] Also in study conducted in North Carolina, we see that smoking is associated with irregular cycles. Odds of having irregular cycles were 3.6 among women who smoked more than a pack a day as compared with non-smokers (95%, CI=1.7–8.0).[9]

This study found that 52.5% of study participants have never used any kind of contraception while 47.2% used, out of which 75.3% take hormonal therapies within age 17–35 years, which were taken mostly for preventing pregnancy (65.5%) or gynecological diseases. Our study showed that females using or ever had used any hormonal therapy have significant relation with irregular menstrual cycles (AOR 1.21, CI 1.65–3.07), as compared to the study published in *British Medical Journal* according to which frequency of menstruation reduces to once every three months in 196 women by continuous administration of OCPs (in first month 24% women had spotting, in second month 16%, in third month 10% while in fourth consecutive month 4%).[13,18] In co-relation to socio-demographic characteristics of our study participants, 90.7% female presenting with complaints of menorrhagia were married out of which more than half (69.35%) were married at an early age (12–24 years), showing that married women present more than one time with menorrhagia (AOR 1.55, CI 1.35–3.74) than unmarried. Those women who had more than six children were present more than one time with irregular menstrual cycles (AOR 1.48, CI 1.26–6.07). More than half of women (65.5%) complained of menorrhagia for two or more months, having bleeding days of 2–10 in majority women and with no skip cycles in 63.9% women, but menorrhagia was associated with pain (dysmenorrhea) in 82.5%, showing that menorrhagia is painful in majority of women.[19]

In this study, 57.4% females gave past history of diseases while 58.7% gave insignificant surgical history. Study found that females undergoing normal vaginal delivery are more prone to develop menorrhagia. So it shows that women who have gone through surgical methods have 76 times less chances of presenting with complaints of menorrhagia (AOR 0.24, CI 0.25–0.45), as compared to those having insignificant past surgical history.[20]

In contrast to our findings, a study was conducted by University Hospital Utrecht, The Netherlands, on 182 healthy women, according to which menstrual blood loss significantly increases after age 40 (Mann–Whitney's ranks sum test, $P < 0.05$) and smoking appears to have no role in it.[14] However our study showed how menorrhagia complaints become less common with increasing age and is associated with smoking and other addictions (beetle nuts, naswar etc.)

The limitations of this study are this study is cross-sectional, the causal factors not are determined accurately, and the sample size is 183 due to time and resource constraints. Secondly responses may be influenced by possibly recall bias or information bias or both.

CONCLUSION

The information received in this study highlights that menorrhagia is one of leading gynecological issues, whose incidence can be decreased by preventing certain modifiable risk factors such as hormonal imbalance, smoking, and contraception. These factors should be prevented by creating awareness among women such as to avoid use of nicotine, etc., and also made some kind of policy to avoid menstrual cycle disorders.

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Conflicts of interest

There are no conflicts of interest between authors.

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