

Relationship between menstrual abnormalities, anemia and hematological parameters among university students

NIMRA MASOOD BAIG¹, SAIMA NAZ SHAIKH², AYAZ ALI SAMO³, RAHEELA BIBI SAYED⁴, JAMSHED WARS⁵, ZULFIQAR ALI LAGHARI⁶

¹PhD Scholar, department of physiology, University of Sindh Jamshoro

²Assistant Professor of physiology, LUMHS Jamshoro

³Assistant Professor of physiology, University of Sindh Jamshoro

⁴Assistant Professor, Government Nuzreth College Hyderabad

⁵Associate Professor of physiology, University of Sindh Jamshoro

⁶Professor of physiology, University of Sindh Jamshoro

Corresponding author: Dr. Saima Naz Shaikh, Email: saima.naz@lumhs.edu.pk

ABSTRACT

Objective: To determine the relationship between anemia, menstrual abnormalities and hematological parameters among students, who are studying at Sindh University and are the permanent residents of Hyderabad city.

Methodology: This cross-sectional study was carried out at physiology department, university of Sindh Jamshoro. Study duration was one year from August 2018 to July 2019. All participants were the permanent resident of Hyderabad, aged from 18 to 25 years, and willing to contribute in the study. The questionnaire was designed to elicit comprehensive responses from participants regarding hematological parameters and menstrual abnormalities. Menstrual abnormalities such as poly-menorrhoea, menorrhagia, oligo-menorrhoea, dysmenorrhoea, and amenorrhoea were determined using the menstrual history. Participants with a hemoglobin level of <12 gm/dl were deemed anemic. SPSS version 20 was used to analyze the data.

Results: A total of 300 individuals were randomly selected for this study, and 283 of them agreed to have their blood drawn. The participants' average age was 20.99±1.87 years. Most of the participants had irregular cycle 44.52%, followed by oligomenorrhoea 13.43%, Polymenorrhoea 11.66% and remaining were normal. Hypomenorrhoea was seen in 8.48% of the respondents while hypermenorrhoea was seen in 7.42% of the respondents. 14.49% of females reported the duration of menstrual bleeding for fewer than three days, and 34.63% reported normal duration of menstrual bleeding. Longer menstrual bleeding days (>7 days) was 26.85%. Anemia in the participants was 45.94%, out of this mild, moderate and severe anemia was 32.51%, 7.42% and 6.01% respectively. RBCs, HCT and WBCs were statistically significant in terms of menstrual abnormalities ($P<0.05$), whereas other hematological parameters remained statistically insignificant in terms of menstrual abnormalities ($p>0.05$).

Conclusion: Prevalence of menstrual abnormalities and anemia were observed to be frequently high among female students of Sindh University's permanent residents of Hyderabad.

Key words: Menstrual patterns, menstrual abnormalities, Anemia, University students

INTRODUCTION

Menstrual cycle is a characteristic wonder including the release of blood from the uterus through the vagina, happening at more or less regular ordinary month to month spans during the reproductive age of the females.^{1,2} Although there are several types of the menstrual abnormalities like premenstrual symptoms, abnormal bleeding patterns, dysmenorrhoea, Polymenorrhoea, amenorrhoea, menorrhagia, oligomenorrhoea and the irregular menses.² Menstrual abnormalities are linked to the prolonged bleeding during menses and usually happen right after the menarche in the results of anovulatory cycles.³ Poly-menorrhoea is defined as a period of below 21 days, whereas oligo-menorrhoea is defined as a period of over 35 days. The average menstrual cycle lasts between 21 and 35 days; less than 21 days considered as polymenorrhoea and longer than 35 days defined as oligomenorrhoea. Dysmenorrhoea is painful menstrual bleeding. Hematological factors are typically indicators for underlying conditions. Regardless of menstrual dysfunctions, menstrual disruption may link to coagulation abnormalities and a decline in the number of platelets. Increase in number of WBCs suggests a pathological condition as well as some underlying abnormalities. RBCs, together with hemoglobin, platelets, and WBC, all have a part in a variety of pathological

conditions, and it is critical to examine hematological parameters as well as menstrual patterns in order to diagnose and identify disorders. Hemoglobin is perhaps the most studied hematological factor; a drop of hemoglobin level below 12gm/dl is defined as anemia. Anemia affects people of all ages, but it is particularly common in young adults and adolescents, especially in reproductive age women.⁴ Menstrual abnormalities and conditions, as well as gynecological problems, are further contributors to anemia.⁵ Although the polymenorrhagia and the menorrhagia are common risk factors associated with anemia among adolescents, additionally to other like poor socio-economic status, poor dietary habits and worm infestation etc.⁵ Period of the adolescence is essential because of progress from adolescence to adulthood and it is the most suitable time, to mediate any wellbeing problem.^{6,7} Women with even mild anemia experience exhaustion and diminished work capacity. However, poor dietary patterns are a significant general wellbeing concern among students of the University. Skipping of the meal, eating out of the home and fast-food consumptions incline them to dietary inadequacies.^{6,8} Despite the fact that anaemia has an impact on university students' academic performance, there is no evidence of concern in the research. Hence this study was carried out to determine the prevalence of anemia and menstrual

abnormalities among female students of Sindh University permanent residents of Hyderabad.

MATERIAL AND METHODS

This was a cross-sectional research study took place in physiology Department, university of Sindh Jamshoro. Study duration was one year from August 2018 to July 2019. Total 283 the permanent resident of Hyderabad, female gender, aged from 18 to 25 and those willing to contribute were included in this study. Participants with a history of serious illnesses, those on hormone replacement therapy or any medication, or those receiving treatments for any sort of infection, as well as those who were unwilling to submit information, were all excluded from this research study. The data was acquired using a structured questionnaire that was organized into divisions such as sociodemographic information, menstrual pattern, and anemic pattern. Before collecting the data, all of the respondents were told of the data's confidentiality. The questionnaire was given out between the hours of 10 and 11 a.m. Pre-filling and post-filling time of questionnaire was recorded. The questionnaire was designed to elicit comprehensive responses from participants regarding menstrual patterns and abnormalities, including menarche age, bleeding duration, cycle length, and discomfort. Menstrual abnormalities such as polymenorrhea, menorrhagia, oligo-menorrhoea, dysmenorrhoea, and amenorrhoea were determined using the menstrual history of previous six months. Participants with a hemoglobin level of <12 gm/dl were deemed anemic. Hemoglobin level from 11 to 11.9 gm/dl was considered mild anemia, hemoglobin level from 8 to 10.9 gm/dl was considered as moderate anemia and less than 8 gm/dl was categorized as severe anemia. Statistical analysis was carried out using the SPSS version 20. Data was first edited before detailed analysis. Frequencies and percentages were used for showing the incidence and prevalence rate. Quantitative data was analyzed using ANOVA. P-value was set at <0.05 as significant. Verbal consent was obtained before collecting the data

RESULTS

A total of 300 individuals were chosen for the study, and 283

of them agreed to have their blood drawn. The participants' average age was 20.99±1.87 years. The participants with irregular cycle or no fixed cycle length made up 44.52% of the total, followed by Polymenorrhea in 11.66% of respondents (21 days), oligomenorrhoea in 13.43% of respondents (>35 days), and participants with no menstrual dysfunction in 30.39% (menstrual length 21-35 days). Hypomenorrhoea was found in 8.48% of the respondents while hypermenorrhoea, was seen in 7.42% of the respondents. Duration of menstruation was also recorded, with 14.49% of females reporting bleeding for fewer than three days, and 34.63% reporting typical bleeding days of three to seven days. Longer bleeding days (>7 days) were seen in 26.85% of respondents and 24.03% of respondents had an abnormal bleeding pattern. The total 4.24% of respondents missed 3 menstrual cycles consecutively. The non-anemic respondents were 54.06% and anemic respondents were 45.94% (table.1). RBC, HCT and WBC were statistically significant (p<0.05) in terms of length of menstrual cycle (table 2). Whereas only hemoglobin was found statistically significant (p<0.05) regarding pattern of menstrual flow (table 3). All other hematological parameters were found statistically insignificant (P>0.05) in terms of cycle length and menstrual flow (table 2 &3).

Table 1. Prevalence of menstrual patterns, menstrual abnormalities and anemia in participants (n=283).

Variables	n (%)	
Length of menstrual cycle in days	No fixedcycle	126 (44.52)
	<21	33 (11.66)
	>35	38 (13.43)
	21-35	86 (30.39)
Number of Pads	< 2	24 (8.48)
	>5	21 (7.42)
	2-5	238 (84.10)
Duration of bleeding in days	Irregular	68 (24.03)
	>7	76 (26.85)
	3-7	98 (34.63)
	<3	41 (14.49)
AmenorrhoeaAnemia	Yes	12 (4.24)
	No	271 (95.76)
	Mild	92 (32.51)
	Moderate	21 (7.42)
	Severe	17 (6.01)

Table 2: Hematological parameters according to the length of menstrual cycle (n=283)

Variables	Normal	Polymenorrhoea	Oligomenorrhoea	No Fixed Cycle	F test	P value
Hb (gm/dl)	10.88±1.69	11.10±1.04	11.16±1.71	10.84±1.50	0.58	0.6
RBC (10 ⁶ /µl)	4.13±0.46	4.12±0.54	4.17±0.37	4.19±0.47	2.6	.052*
HCT (%)	32.06±3.54	31.91±4.30	33.86±3.25	32.39±3.27	2.71	.045*
MCV (fl)	79.18±10.25	81.35±11.60	81.41±7.93	80.40±9.13	0.68	0.56
MCHC (g/dl)	33.28±0.98	33.47±1.24	33.22±0.78	33.38±0.83	0.62	0.59
MCH (pg)	26.40±3.89	26.85±4.12	27.13±3.15	27.12±3.09	0.80	0.49
WBC (10 ³ /µl)	7.85±1.86	7.46±1.89	7.09±1.75	7.10±1.81	3.22	.023*
PLT (10 ³ /µl)	321.60±113.30	310.19±120.21	311.82±127.30	329.78±128.92	0.35	0.78

*significant at P <0.05, ANOVA F-test was used for comparing mean values of variables

Table 3. Hematological parameters according to the flow of menstrual bleeding n=283

	NORMAL	HEAVY	LESS	F test	P value
HB (gm/dl)	10.87±1.45	10.51±1.29	11.83±2.24	5.19	0.006*
RBC (10 ⁶ /μl)	4.16(0.49)	4.19(0.50)	4.06(.39)	0.53	0.533
HCT (%)	32.11(3.39)	32.53(4.66)	33.10(3.39)	0.96	0.383
MCV (fl)	78.45(9.83)	81.19(10.95)	82.01(9.71)	1.98	0.134
MCHC (g/dl)	33.37(1.00)	33.46(0.89)	33.05(1.11)	1.25	0.282
MCH (pg)	26.48(4.00)	26.29(3.37)	27.16(3.76)	0.36	0.694
WBC (10 ³ /μl)	7.63(1.82)	8.05(1.29)	7.21(1.80)	1.19	0.355
PLT (10 ³ /μl)	317.65(126.38)	278.62(85.91)	309.43(102.36)	0.18	0.822

*significant at $P < 0.05$, ANOVA F-test was used for comparing mean values of variables

DISCUSSION

The prevalence of menstruation problems, as well as related variables, has been linked to several factors. The primary variables that have been identified include reductions in hemoglobin level because of blood loss, as well as gynecological disorders that induce menstruation complications. Studies have also looked into the link between menstrual problems and BMI. Polymenorrhea was found to be 11.66 percent in this study, which is lesser than 13.2 % reported in a study on young Saudi university female students by Rafique N et al², and greater than 8.22% reported in Indonesian study by Azis AA et al⁹. Our findings were also greater than the findings of Karki PK et al¹⁰ and Shah KH et al¹¹. One more study from Ghana reported much lesser incidence of Polymenorrhea in up to 2.5% of students by Osonuga A et al¹². In this study, 13.43 % of the participants had oligomenorrhea, compared to 5.5 % reported in students of Saudi medical college by Rafique N et al², and 6.1 % in Ghanaian students. The prevalence was observed to be 6.3 % in young Indian females,^{11,12} 9.9% in students of Kathmandu medical college reported by Karki PK et al¹⁰ and 12.44 % in biology students of Makassar demonstrated by Azis AA et al⁹. In another research from Pakistan, females with abnormal bleeding had a considerably greater prevalence of Polymenorrhea (30%). Low BMI has been linked to a greater prevalence of Oligomenorrhea, which might be attributed to dietary inadequacies, as documented in a lot of Pakistani research studies. Menorrhagia was reported to be 7.42 % in this study, compared to 3.4 % in female students from Saudi; nevertheless, the findings in present study are significantly lower (11.7 %) than those reported in Indian (11.7 %) and Ghanaian (23.4 %) investigations.^{11,12} Menorrhagia is more prevalent in females over 35 years of age, while it is less frequent in young females reported by the Banu F et al¹³. Hypomenorrhea was found to be 8.48%, which is comparable to other research study of Rafique N et al², while it was somewhat lower 5.6 % among Ghanaian students reported by the Osonuga A et al¹², whereas it was greater 10.9 % in young females from India¹¹. Hypomenorrhea prevalence in present study was 27.7% higher than in previous research, which might be attributable to the study's criteria of hypomenorrhea, which utilized the quantity of pads more than 5 instead of the quantity of pads used in other research studies.² In present study, the average age of menarche was 12.53±87, which is lesser than the average age of menarche in studies performed on adolescent females in Lahore and Hyderabad (12.74±1.24 and 12.92±1.41 respectively reported by Dars S et al¹⁴ and AtherUZ et al¹⁵. The mean age of females was likewise found to be 11.73±1.2 in research of several

ethnic groups, while these studies also revealed the variance in mean age across ethnic groups demonstrated by the Ahmed SM et al¹⁶. Menarche age has been shown to be decreasing in recent research and his might be attributed to improved nutritional status as well as other socio-demographic variables.^{16,17} Amenorrhea was found to be 4.2% lower in this research than 9% reported was in a study of Saudi students by Ra Rafique N et al². This study reveals the highest prevalence of no fixed pattern or irregular pattern, which is significantly higher than in prior studies.¹²

CONCLUSION

Menstrual abnormalities like oligomenorrhea, polymenorrhagia and irregular pattern were observed to be frequently high in the study subjects and prevalence of anemia was 45.94% among female students of Sindh University permanent residents of Hyderabad. Menstrual abnormalities and the anemia can affect physical and their psychosocial well-being of the students and may cause of class absences. Awareness programs should be done regarding these morbidities to cure the student's life and to prevent the effects of these diseases on the education.

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