

Prevalence of Menstrual Dysfunction and its Comparative Correlation with Anaemia

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Abstract

Background: To find out prevalence and pattern of menstrual abnormalities and its contribution to anaemia in teen age students and compare it with other causes of anaemia in them.

Methods: In this observational cross sectional study, 317 students were included after taking their consent. All girls included in the study; were students ranging from school to medical college, and aged 10-19 years. Details of menarche and menstrual cycle, history of passage of worms in stools, thyroid disease, liver disorder and bleeding clotting disorders were noted.

Results: Out of 317 cases 159 (50.6%) were anemic. Sixty percent of adolescents belonged to relatively better socio-economic group, 90% were unmarried, 87.4% non-vegetarian, body mass index (BMI) >25 was present in 53/317 cases, <19 in 29/317. All these variables had no significant relationship with anemia statistically (p-value >0.05). Mean age of menarche was 12.95 years in anaemic adolescents and 12.83 in those without anaemia. Out of 317 menstrual cycle was normal in 60.9%, scanty menstruation in 0.3%, irregular normal flow 6.6%, while 15.8% had irregular heavy menses, 3.5%: heavy regular menses. Heavy menstrual bleeding both regular & irregular was highly associated with anaemia (p-value <0.001). Dysmenorrhea was present in 57.9% anaemic teens (p-value <0.001). Worm infestation was present in 10.1% cases (p-value <0.001) indicating highly significant association with anaemia. p-value for bleeding/clotting disorders was 0.014 showing significant link with anemia.

Conclusion: Menstrual dysfunction is the main contributor to anaemia in female adolescents other factors being worm infestation and bleeding/clotting disorders. It needs urgent attention of parents and healthcare providers to correct anaemia according to cause and improve their quality of life and ensure healthy mothers in future.

Key Words: Menstrual Dysfunction, Anaemia, Menorrhagia

Introduction

Adolescence (10-19 years of age) is critical period of life characterized by significant changes like increasingly pulsatile secretion of gonadotrophins, change in body contour and development of brain (prefrontal cortex, improved connectivity of various networks). These changes (adrenarche, thelarche, menarche, growth spurt) are more marked in early phase (10-14 years) and further consolidated in its late part (15-19 years) marking a paradigm shift in the pattern and style of life.¹⁻³

Normally menarche is expected within 2-3 years of the larches, cycle length varies from 21-45 days, duration of menstrual period 2-7 days, and 3-6 pads/day are consumed. Menstrual cycles become predominantly ovulatory within 8-12 years of menarche.⁴ Pattern of menstruation may not be regular, menstrual blood loss may be excessive adding to stress, and causing compromised quality of life. Hesitation to share these issues with parents and health care providers aggravates implications of irregular, heavy and prolonged menstruation. Irregularity of newly initiated menstrual cycle, a common occurrence in adolescents, is largely attributed to immaturity of hypothalamic pituitary ovarian axis.⁵ Anovulation is the most frequent physiological cause of heavy and prolonged periods. Other causes are stress, eating disorders, thyroid dysfunction, diabetes mellitus, bleeding disorders etc.⁶ Menorrhagia and polymenorrhagia is a risk factor for development of anemia in adolescents in addition to other causes like worm infestation, poor socio-economic status, dietary habits etc.

Assessment of Menstruation serves as a benchmark indicator of reproductive health in teen agers.⁷ Studies from developing countries show prevalence of excessive menstrual bleeding in <1-18% adolescents.⁸ Anaemia affects 30% women worldwide.⁹ Very high percentage of anaemia was seen in Pakistani adolescent girls in one study.¹⁰ Anemia was found highly prevalent in adolescents in rural areas of Maharashtra India.¹¹

Globally largest generation of adolescents is approaching adulthood in human history. ^{2, 7}Pakistan has a great population (9619874 girls in 10-14 years group, and 8211804 girls in 15-19 years group) of adolescent girls approaching adulthood without proper care of their health especially the newly acquired menstrual function. ¹² The anemic adolescent girls enter into adulthood with poor general health and little resistance to infections and low threshold to develop serious morbidity as a result of even mildly excessive blood loss in labor.¹³ In a study on prevalence of anaemia in primigravida, 78% of them were found anaemic indicating that root causes lie in pre-marital period (childhood and adolescence) and this is the motivation for this study.¹⁴

Patients and Methods

This observational cross sectional study was conducted in King Edward Medical University. Three hundred and seventeen students, aged 10-19 years, were included after taking their consent. Convenient sampling method was used; duration of study was 6 months from July 2014-Jan. 2015. Details of menarche and menstrual cycle were noted. Menarche was defined as the time of onset of first menstrual period. Normal age range for menarche is 12-15 years. Menorrhagia was defined as heavy and/or prolonged cyclical bleeding. Oligomenorrhoea was defined as scanty bleeding. Infrequent menstruation was bleeding every 3-4 months. Dysmenorrhoea the painful menstruation. Anaemia was defined as hemoglobin level less than 12 grams/deciliter. Severe anaemia: <7gm./dl, moderately severe anaemia: 7-9gm./dl, mild anaemia: >9-11.9 gm./dl. Weight and height were measured to calculate body mass index in Kg/m²

Results

Out of 317 cases 159(50.6%) were anaemic. Sixty percent of adolescents belonged to relatively better socio-economic group, 90% were unmarried, 87.4% non-vegetarian, body mass index(BMI) >25 was present in 53/317 cases, <19 in 29/317. All these variables had no significant relationship with anaemia statistically (p-value >0.05). Mean age of menarche was 12.95 years in anaemic adolescents and 12.83 in those without anaemia (Table 1). No statistically significant association of anaemia with age of menarche was found in this study.

Out of 317 adolescents, menstrual cycle was normal in 66.9%, scanty menstruation in 0.3%, irregular normal flow 6.6%, while 15.8 % had irregular heavy menses, 3.5%: heavy regular menses. Heavy menstrual

bleeding both regular & irregular was highly associated with anaemia (p-value

Table 1: Mean age, BMI and age at menarche in anaemic and non-anaemic cases

	Anemia	No. of cases	Mean	S.D	Minimum	Maximum	p-value
Age (years)	Absent	158	17.39	1.48	13.00	19.00	<0.001**
	Present	159	16.67	1.85	12.00	19.00	
	Total	317	17.03	1.71	12.00	19.00	
BMI	Absent	158	22.42	3.03	16.45	32.00	0.947
	Present	159	22.39	3.26	13.70	35.60	
	Total	317	22.41	3.14	13.70	35.60	
Menarche	Absent	158	12.83	0.59	11.00	14.00	0.131
	Present	159	12.95	0.81	11.00	16.00	
	Total	317	12.89	0.71	11.00	16.00	

BMI= body mass index, S.D = standard deviation,** Highly significant association

Table 2: Menstrual dysfunction and anaemia- Factors responsible

	No	Percentage	
Income	<10000	32	10.1
	10000-15000	93	29.3
	20000 and above	192	60.6
	Total	317	100.0
Menstruation	Scanty	2	.6
	Normal	212	66.9
	Heavy	11	3.5
	Irregular heavy	50	15.8
	Irregular normal flow	21	6.6
	Irregular scanty	21	6.6
Diet	Veg	40	12.6
	Non-veg	277	87.4
Marital	Unmarried	285	89.9
	Married	32	10.1
Dysmenorrhea	142	44.8	
Heavy bleeding	18	5.7	
Hypothyroidism	7	2.2	
Liver dysfunction	3	0.9	
Bleeding clotting disorder	6	1.9	
Worm infestation	73	10.1	

<0.001). Dysmenorrhea was present in 57.9% anaemic teens (p-value <0.001). Statistically significant

association of anemia with dysmenorrhea associated both with heavy menstrual bleeding as well as those with normal or scanty bleeding was found. Worm infestation: worm infestation was present in 10.1% cases (p-value <0.001) indicating highly significant association with anemia (Table 2). While p-value for bleeding/clotting disorders was 0.014 showing significant link with anaemia (Table 3). Anaemia was seen in 52% of women with dysmenorrheal (Table 4)

Table 3. Comparative association of anaemia with different variables

		Anaemia		P-value
		Absent	Present	
Income	<10000	15(9.5%)	17(10.7%)	0.936
	10000-15000	47(29.7%)	46(28.9%)	
	20000 and above	96(60.8%)	96(60.4%)	
Marital status	Married	142(89.9%)	143(89.9%)	0.985
	Unmarried	16(10.1%)	16(10.1%)	
Body mass index	<19	14(8.9%)	15(9.4%)	0.595
	Normal	121(76.6%)	114(71.7%)	
	>25	23(14.6%)	30(18.9%)	
Menstruation	Scanty	2(0.6%)	0(0.0%)	<0.001**
	Normal	122(77.2%)	90(56.6%)	
	Heavy	1(6.3%)	10(6.3%)	
	Irregular heavy	7(4.4%)	43(27.0%)	
	Irregular normal flow	10(6.3%)	11(6.9%)	
Diet	Veg	18(11.4%)	22(13.8%)	0.512
	Non-veg	140(88.6%)	137(86.2%)	
Dysmenorrhea		50(31.6%)	92(57.9%)	<0.001*
Hypothyroidism		5(3.2%)	2(1.3%)	0.248
Liver dysfunction		1(0.6%)	2(1.3%)	0.566
Bleeding clotting disorder		0(0%)	6(3.8%)	0.014*
Worm		20(12.7%)	53(33.3%)	<0.001**

** Highly significant association, *significant association

Table 4 :Correlation of dysmenorrhea with anaemia

Dysmenorrhoea	Anemia		p -value	Total
	Absent	Present		
No dysmenorrhoea	108	67		175
Dysmenorrhea present	45	52	.000	97
Dysmenorrhea with menorrhagia	05	40	.000	45
	158	159		317

Discussion

Prevalence of anaemia in present study was 50.6% having highly significant association with abnormally heavy menstrual bleeding and dysmenorrhea in addition to worm infestation and bleeding from gums and nose. Prevalence of anaemia was 68.8%, 21%, 90% and 52.2% in adolescent girls in different studies.¹⁵⁻¹⁸ Menstrual function is an important landmark measure of normal adolescence. Pattern of menstruation in adolescents of our study revealed normal cycle in 66.9% participants. Regular/ irregular scanty menstruation (7.2%), irregular cycle with normal flow(6.6%), and heavy regular/ irregular heavy cycles were present in(19.3%). Heavy regular and irregular cycles are important contributory factors to adolescence anaemia especially in developing countries with gender bias and low socio-economic status among other contributory factors.

In a Singaporean study oligomenorrhoea was present in 15.3% while polymenorrhoea in 2.0% adolescents and dysmenorrhea was reported in 83.2% girls.⁵ In a study from Hyderabad 76% adolescents had normal menstrual cycle, 17% had heavy cycles, and 7% had scanty menstruation while 60% girls were anaemic.¹⁹ Prevalence of heavy cycles in this study is comparable to that in our study. 57.9% anaemic adolescents in our study reported dysmenorrhea. Association was significant in those having heavy cycles and those not having heavy menstrual bleeding.

Dysmenorrhea was experienced in 75 to 89% adolescents, in different studies.²⁰⁻²³ It appears that in addition to its association with heavy, prolonged cycles, its impact on attitude and quality of life can not be ruled out.²⁴

Worm infestation was reported in 10% of adolescents in our study, which is expectable in the context of lack of clean water supplies for a large segment of our population. Worm infestation is highest among school children according to UNICEF, and hence this problem continues in to adolescence if these children are not dewormed in time.²⁵ Other factors like BMI, age of menarche, liver dysfunction, thyroid disorders, vegetarian or non- vegetarian dietary habits, were not found associated with anaemia.

In a nutritional survey, prevalence of anaemia in children under 5 years of age was 33.3%.²⁶ In girls, approaching puberty, menstrual dysfunction irrespective of the underlying cause plays leading role in producing or worsening of pre-existing anaemia. So that these young women enter in to marital life in substandard health and account for high prevalence of

anemia in primigravida in our population and hence exposed to high maternal morbidity and mortality.¹⁴

Conclusion

Menstrual dysfunction is the main contributor to anemia in female adolescents other factors being worm infestation and bleeding/clotting disorders.

References

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