Original Article

Assessment of anxiety, stress and depression in primary dysmenorrhic females

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Abstract

Background: Dysmenorrhea is the most common gynecological complaint, adversely affects the quality life and work productivity in females of reproductive age. Risk factors for primary dysmenorrhea include age, early menarche, low body mass index (BMI), menorrhagia, family history, smoking, nulliparity, depression and stress. This study was carried to find out the pattern of dysmenorrhea in young Pakistani females, and to determine its association with stress, depression and anxiety.

Methodology: This was a cross sectional questionnaire based study conducted on 300 female participants of age 20-30 years studying at the local university. Healthy, nulliparous females with the occurrence of dysmenorrhea were included in the study whereas those females who had gynecological, psychological or other medical problems were excluded from the study. Students were asked to provide the information about their socioeconomic status, dysmenorrheal symptoms, mental health status, their habits and other medical characteristics. To evaluate the effect of stress, depression and anxiety, Depression, Anxiety Stress Scale (DASS) was used. All statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 16.

Results: Of the total dysmenorrhic females 31% were married, 57% had positive family history of dysmenorrhea, 18% of the subjects had BMI<18Kg/m^2 while 39% reported high waist hip ratio (WHR). The incidence of menstrual irregularity and menorrhagia was identified in 67% and 71%, respectively while passing of clots were found to be in 71% subjects. Significant differences were observed in terms of anxiety (p=0.025) and stress (p=0.028) between the two groups but there was no statistical difference in the levels of depression (p=0.11). It was found that depression is a common complaint irrespective of presence or absence of dysmenorrhea during periods.

Conclusion: This study shows that high stress level and anxiety were positively associated with primary dysmenorrhea in young adolescent females. Therefore, mental health promotion and counselling measures should be taken to lessen the severity of dysmenorrhea.

Keywords

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Introduction

Dysmenorrhea is characterized as a throbbing and aching sensation which emanates in the lower abdomen or pelvis before or during menstruation along with other symptoms like nausea, vomiting, diarrhea, nervousness, dizziness, headache and fatigue. It is classified into primary and secondary dysmenorrhea. Primary dysmenorrhea is defined as a menstrual pain in the absence of any apparent pathologic disease. Secondary dysmenorrhea refers to a menstrual pain which involves the underlying pathologic condition[1]. Diagnostic features of primary dysmenorrhea include onset of pain shortly after menarche, absence of pelvic pathology and having good response to combined oral contraceptives (COCs) and Nonsteroidal anti-inflammatory drugs (NSAID)[2]. Dysmenorrheal pain is caused by the increased prostaglandin levels in the endometrium. The identified risk factors for dysmenorrhea are early menarcheal age, increased duration of menstrual flow, positive family history of dysmenorrhea, higher intake of caffeine, smoking and alcohol consumption[2&3].

Dysmenorrhea causes the interference with the daily activities and severely affect the quality of life[4]. Dysmenorrhea negatively affects the social and mental status of the females. Many Studies have been conducted so far to find out the relationship between psychological factors and risk of dysmenorrhea[5]. Some studies found a positive correlation between stress and dysmenorrhea[6&7] while few studies have found a negative relationship between them. The mechanism underlying stress and risk of dysmenorrhea is not well understood. Previous studies have reported that high job stress has a positive correlation with dysmenorrhea.

The mechanism underlying stress and dysmenorrhea might involve the neuroendocrine regulation. Stress related hormones (epinephrine, cortisol) can alter the prostaglandin synthesis, release and it's binding in the myometrium[8]. Stress can also impair the development of follicles by inhibiting the follicle stimulating hormone (FSH) and luteinizing hormone (LH) release which leads to impaired synthesis and release of the hormone progesterone. This in turn may alter the activity of prostaglandin synthesis[8].

Limited number of studies has been conducted so far to examine the link between stress and dysmenorrhea in the Pakistani population. The aim of the present study is to evaluate the risk factors associated with Primary Dysmenorrhea in adolescent females of Pakistan, and its relationship with the stress, depression and anxiety.

Methodology

This cross sectional randomized study was conducted on 300 young females (dysmenorrhic = 150, healthy = 150), whose age ranged between 20–30 years. Females suffering from chronic disorders including diabetes mellitus, clinically established hypertension, liver cirrhosis, chronic kidney disease, polycystic ovarian syndrome and using steroids were excluded from the study. A structured questionnaire was used to record the demographic data, anthropometric data, reproductive state, nutritional status, mental health status. For the estimation of mental health status, DASS was used consisted of total 42 questions, 14 for each of three measures: depression, anxiety and stress[9]. Height and weight were also measured to calculate BMI while WHR was also recorded. The participants were clearly explained the purpose of study and written consent was obtained while the ethical principles highlighted in Helenski Protocol followed all over the study. The collected data was analyzed using statistical analysis software SPSS version 16 and results were expressed as percentage and/or Mean±SD. Chi Square test was applied to compare the differences between

normal and dysmenorrhic subjects. Differences were considered at a significance level of 0.05.

Results

Table I shows the general information collected from study population, it was noticeable that most of the young females suffering from dysmenorrhea are bearing normal weight as compared with healthy partakers. Most of the normal and dysmenorrhic subjects fall in high waist hip ratio range. Menorrhagia was a common finding in about more than half of suffering females though menstruation found regular.

Table I: Baseline characteristics of the dymenorrhic and control normal subjects

Parameter	Sub-classification	Dysmenorrhic (n=150)	Control (n=150)
BMI	<18	27(18)	28(18)
	18.5-24.9	90(60)	9(06)
	25-29.99	18(12)	104(69)
	>30	15(10)	9(06)
WHR	<0.8	41(27)	23(15)
	0.81-0.85	59(39)	55(37)
	>0.85	50(33)	72(48)
Menstrual regularity	Yes	101(67)	103(68)
	No	49(33)	47(31)
Married		49(31)	61(41)
Menorrhagia		107(71)	18(12)
Clots Passing		107(71)	61(40)
Positive Family History		85(57)	59(39)

*Values are given as n(%).
*BMI-Body Mass Index; WHR- Waist-To-Hip Ratio

The participants' responses against DAAS questionnaire during periods showed that depression is a common finding at this time irrespective of dysmenorrhea presence ($\chi2 =7.59$, p=0.11), while significant anxiety recorded higher in dysmenorrhic group ($\chi2 =11.14$, p=0.025) as compared with healthy counter parts. Moreover stress is also distinguishably greater in dysmenorrhic females ($\chi2 =10.88$, p=0.028) (Table 2).

Table 2: Incidence of Stress, Anxiety and Depression during periods in Dysmenorrhic females as compared with healthy females on the basis of DAAS scale

Variables	Categories	Normal	Dysmenorrhic	Pearson's $\chi2$	P- value
Anxiety	Normal	36	34	11.14	p<.05
	Mild	17	19		
	Moderate	28	51		
	Severe	44	22		
	Extremely Severe	25	17		

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Stress	Normal	56	86	10.88	p<.05
	Mild	25	28		
	Moderate	37	26		
	Severe	25	5		
	Extremely Severe	7	5		
Depression	Normal	57	50	7.59	p>.05
	Mild	32	41		
	Moderate	37	44		
	Severe	19	14		
	Extremely Severe	5	1		

*Values are given as frequency (n).

*p<0.05 was considered significant.

Discussion

This study was aimed to identify the psychological risk factors of dysmenorrhea among university students. Overall, we found the higher prevalence of high WHR, menstrual irregularities, menorrhagia, passing of clots and family history in the dysmenorrhic females[10]. No associations were observed between education and marital status with the dysmenorrhea. Recent studies have shown that BMI of 20 kg/m² or less; early menarche, long menstrual intervals or long menstrual periods, massive menstrual volume, positive family history and smoking are the known risk factors of primary dysmenorrhea[11]. The present study found the non-statistical difference of waist hip ratio between the groups which is in disagreement with the recent research studies establishing the association between dysmenorrhea and anthropometric indices. Central adiposity results in changes in sex steroid hormones such as estrogen, androgens and sex-hormone binding globulin (SHBG)[12]. Conflicting results of the studies have been obtained regarding BMI, physical activity and dysmenorrhea. Few studies suggested the association of low body mass index with the occurrence of dysmenorrhea[13]. In our study, no significant differences were observed in terms of BMI between dysmenorrhic and control group which is consistent with the previous reports[11&14]. Moreover, recent research studies emphasized that body fat distribution is a reliable indicator of obesity than BMI[15].

We found a significant relationship between menorrhagia and dysmenorrhea in the dysmenorrhic group which is similar to the findings of the recent studies[14&16]. Literature reveals that in women who experience menorrhagia, Prostaglandin E2 (PGE2) synthesis and the number of PGE binding sites are greater in uterine tissues compared with those of normal women leading to menstrual blood loss. Majority of the females reported passing of clots during menstruation[17&18]. Our study showed that with passing of clots, pain subsides because 71% of dysmenorrhic females felt better after passing of clots during bleeding. Studies also show that with the passing of clots, severe menstrual cramping relieve[17].

This study shows that the girls who reached the menarche at age of 12 have suffered most with dysmenorrhea which is consistent with the recent researches[10&16]. About 25.33% of dysmenorrhic girls attain their menarche age at 12. Several studies have shown that pubertal development can be influenced by excess adiposity during childhood. Early pubertal onset may be due to high androgen concentrations related to obesity in pre-pubertal girls[19]. Leptin secreted in adipose tissue is a significant link between body fat and

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timing of menarche means that higher levels of leptin signal cause earlier menarche.

Positive family history of dysmenorrhea is an important risk factor for prevalence of dysmenorrhea in girls probably 3.5-times[8&20]. Our study also supports this fact as about 57% of dysmenorrhic females had family dysmenorrhea history, while in normal females approximately 39% had a positive family dysmenorrhea history (Table 1).

There is growing evidence of an association between dysmenorrhea and psychological stress but the biological mechanisms which link stress to dysmenorrhea are not clearly understood[21]. Several studies have reported the association between stress and risk of dysmenorrhea via the alteration of the meuroendocrine responses which encompasses the dysregulation of sex hormones along with cortisol and epinephrine resulting in impaired prostaglandin synthesis and function[14&22]. Among the psychological factors studied, majority of dysmenorrhic females experience severe and extremely severe level of anxiety in contrast to the normal females who have moderate to severe level of anxiety (Table 2). Our study revealed that the most dysmenorrhic females had moderate to severe level of stress. On the other hand, majority of normal females exhibit mild to moderate stress (Table 2). The present study noted depression - common feeling in all females participated that mainly ranged from mild to moderate and rarely reported towards severity (Table 2). But anxiety and stress were prevailed in dysmenorrhic females particularly towards the severe or even higher side based on DAAS calculations that may affect the quality of life. In our study we found a significant association of dysmenorrhea with stress (p=0.025) and anxiety (p=0.028), whereas depression was not significantly associated with dysmenorrhea (p=0.11).

As most of such conditions left unnoticed hence influencing the health gradually, the gynecological counselling and/or intervention focusing on the mental health components such as anxiety, stress and depression may improve the outcome in these females. The study limitation includes smaller sample size, mix marital status that does not elaborate other cofounders may be contributing to stress and anxiety.

Conclusion

The presence of dysmenorrhea increases stress and anxiety in young females while depression is a common complaint associated with menstruation. Suitable medical intervention may be-advised to minimize the effects of stress and/or anxiety on quality of life.

Conflicts of Interest

None.

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References

1. Vincenzo De Sanctis M, Soliman A, Bernasconi S, Bianchin L, Bona G, Bozzola M, Buzi F, De C, Sanctis MD, Tonini G, Rigon F. Primary dysmenorrhea in adolescents: prevalence, impact and recent knowledge. Pediatr Endocrinol Rev (PER). 2015;13(2):465-473.
2. Pejcic A, Jankovic S. Risk factors for dysmenorrhea among young adult female university students. Ann Ist Super Sanita. 2016;52(1):98-103.

3. Faramarzi M, Salmalian H. Association of psychologic and nonpsychologic factors with primary dysmenorrhea. Iran Red Crescent Med J. 2014;16(8):e16307.

4. Subasinghe AK, Happo L, Jayasinghe YL, Garland SM, Gorelik A, Wark JD. Prevalence and severity of dysmenorrhoea, and management options reported by young Australian women. Aust Fam Physician. 2016;45(11):829-834.

5. Bajalan Z, Moafi F, MoradiBaglooei M, Alimoradi Z. Mental health and primary dysmenorrhea: A systematic review. J Psychosom Obstet Gynaecol. 2019;40(3):185-194.

6. Sahin N, Kasap B, Kirli U, Yeniceri N, Topal Y. Assessment of anxiety-depression levels and perceptions of quality of life in adolescents with dysmenorrhea. Reprod. Health. 2018; 15(1): Article number: 13.

7. Gagua T, Tkeshelashvili B, Gagua D, McHedlishvili N. Assessment of anxiety and depression in adolescents with primary dysmenorrhea: a case-control study. J Pediatr Adolesc Gynecol. 2013;26(6):350-354.

8. Wang L, Wang X, Wang W, Chen C, Ronnennberg AG, Guang W, Huang A, Fang Z, Zang T, Xu X. Stress and dysmenorrhoea: a population based prospective study. Occup Environ Med. 2004; 61(12):1021-1026.

9. Nieuwenhuijsen K, De Boer A, Verbeek J, Blonk R, Van Dijk F. The Depression Anxiety Stress Scales (DASS): detecting anxiety disorder and depression in employees absent from work because of mental health problems. Occup Environ Med. 2003;60(suppl 1):i77-i82.

10. Muluneh AA, Nigussie TS, Gebreslasie KZ, Anteneh KT, Kassa ZY. Prevalence and associated factors of dysmenorrhea among secondary and preparatory school students in Debremarkos town,

North-West Ethiopia. BMC women's health. 2018;18(1): Article number 57.

11. Bavil DA, Dolatian M, Mahmoodi Z, Baghban AA. Comparison of lifestyles of young women with and without primary dysmenorrhea. Electro physic. 2016;8(3):2107-2114.

12. Kafaei-Atrian M, Mohebbi-Dehnavi Z, Sayadi L, Asghari-Jafarabadi M, Karimian-Taheri Z, Afshar M. The relationship between the duration of menstrual bleeding and obesity-related anthropometric indices in students. J Educ Health Promot. 2019;8:81.

13. Osayande AS, Mehulic S. Diagnosis and initial management of dysmenorrhea. Am Fam Physician. 2014;89(5):341-346.

14. Ibrahim NK, AlGhamdi MS, Al-Shaibani AN, AlAmri FA, Alharbi HA, Al-Jadani AK, Alfaidi RA. Dysmenorrhea among female medical students in King Abdulaziz University: Prevalence, Predictors and outcome. Pak J Med Sci. 2015;31(6):1312-1317.

15. Nuttall FQ. Body Mass Index: Obesity, BMI, and Health: A Critical Review. Nutr Today. 2015;50(3):117-128.

16. Ju H, Jones M, Mishra G. The prevalence and risk factors of dysmenorrhea. Epidemiol Rev. 2014;36(1):104-113.

17. Tayebi N, Yazdanpanahi Z, Yektatalab S, Pourahmad S, Akbarzadeh M. The Relationship Between Body Mass Index (BMI) and Menstrual Disorders at Different Ages of Menarche and Sex Hormones. J Natl Med Assoc. 2018;110(5):440-447.

18. Karthiga V, Boratne AV, Datta SS, Joice S, Abraham SB, Purty AJ. Menstrual problems and pattern of consultation among adolescent school girls in Pondicherry. Indian J Med Spec. 2011;2(2): 92-95.

19. Amr TE, El-Saidy TM, Mohamed AA. The relationship between obesity and

symptoms of puberty among the adolescent females. Life Sci J. 2012;9(3): 2334- 2340.

20. De Sanctis V, Soliman AT, Elsedfy H, Soliman NA, Soliman R, El Kholy M. Dysmenorrhea in adolescents and young adults: a review in different country. Acta Biomed. 2017;87(3):233-246.

21. Balik G, Ustuner I, Kagitci M, Sahin FK. Is there a relationship between mood disorders and dysmenorrhea? J Pediatr Adol Gynec. 2014;27(6):371-374.

22. Jeon GE, Cha NH, Sok SR. Factors Influencing the Dysmenorrhea among Korean Adolescents in Middle School. J Phys Ther. 2014;26(9):1337-1343.