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PREVALENCE OF PAIN SYMPTOMS SUGGESTIVE OF ENDOMETRIOSIS AMONG ADOLESCENTS IN KENYA
Alex Kagia, MBchB, Kenyatta National Hospital, PO Box 196-00202, Nairobi. Wanyoike-Gichuhi, MBchB, MMed (Obs/Gyn), Kenyatta National Hospital, Po Box 19676-00202 Nairobi, Joseph Karanja, MBchB, MMed (Obs/Gyn), Kenyatta National Hospital, Po Box 19676-00202 Nairobi.

Corresponding author: Dr Alex. Kagia, Department of Obstetrics and Gynaecology, College of Health Sciences, University of Nairobi, PO Box 19676 00200, Nairobi, Kenya.

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A. Kagia, J. W. Gichuhi and J. Karanja

ABSTRACT

Objective: **To determine the prevalence of pain symptoms suggestive of Endometriosis among adolescent Kenyans and their impact on quality of life.**
Study Design: Analytical cross- sectional study
Setting: **Dual centered study at Githunguri Girls High School (Rural) and Moi Girls High School Nairobi (Urban).**
Subjects: **Three hundred and thirteen adolescents were interviewed with even distribution between rural (50.8%) and urban (49.2%) schools.**
Outcome Measure: The primary outcome measure was the prevalence of pain symptoms suggestive of endometriosis.
Results: **Dysmenorrhea was the most prevalent symptom at 72% with severe dysmenorrhea reported at 29%. Regular absenteeism was reported at 4% in those with dysmenorrhea, 1% was due to acyclic pelvic pain and 1% reported intermenstrual pain limiting their daily activities. In the students' interviewed, 94% had not heard of endometriosis, of whom 70% were interested to know more about it. The dysmenorrhea and pelvic pain that interfered with ordinary chores was most likely due to endometriosis.**
Conclusion: **Majority of adolescent girls with chronic pelvic pain, not corresponding to conventional therapy have endometriosis. Endometriosis appearing in adolescence is more likely to progress and if not treated, may progress beyond pain to infertility. Endometriosis in adolescence is a hidden progressive and severe disease that deserves attention, not just compassion.**

INTRODUCTION

Endometriosis is a chronic gynecological condition characterized by pathological growth of endometrial tissue outside the uterus. It is poorly recognized and understood locally (1). Retrospective studies have shown that majority of cases can have the symptoms traced back to the adolescent period. Endometriosis is known to affect any menstruating woman regardless of race, ethnicity or socio-economic status. But it is rare after menopause. In general, it is estimated to affect 10% of the female population with a documented annual incidence of 1.9% cases per 1000 women aged 15 to 49 years (2,3).

The retrograde menstrual flow theory coined by Sampson suggested backflow of menstrual flow through the tubes contributed to pelvic endometriosis (19). Though this was shown to occur in 90% menstruating women, it did not explain why the tissue survives in some and

not in others. The pathophysiology of pain is explained by the fact that the endometrial like tissue is not able to escape its ectopic site remaining stagnant and, in the process, undergoing chemical changes that leads to production of irritant substances that cause or mediate pain (4) Endometriosis typically presents with severe menstrual pain. The symptoms typically recur in a cyclic fashion and exacerbations occur during menstruation. Endometriosis symptomatology mainly includes pelvic pain and infertility. The most common symptom of endometriosis in adolescents is chronic pelvic pain. Primarily, it is considered as primary dysmenorrhea, it can be either acyclical or cyclical i.e. dysmenorrhea.

Initially treated with NSAIDS and if no improvement, OCPs are then used (5). This has led to delay in its diagnosis. Therefore, it is prudent that if such treatment fails in this regard, a suspicion of endometriosis should be queried (6). ESHRE recommendations outline the need for diagnostic laparoscopy for such patients where medical therapy has failed (6). Apart from this biological aspect, endometriosis has a negative effect on the woman's psychological, economic and social wellbeing leading to a poor quality of life (18). Due to limitation in resources regionally, to adequately diagnose endometriosis, this study is trying to focus on trying to identify those at risk of developing or having endometriosis targeting the adolescent population to allow proper referral for early intervention and care. A recent study was done that documented certain clinical parameters noted after menarche that gave a high probability of later diagnosis of deep infiltrating endometriosis in adulthood. These included a positive family history of endometriosis, absenteeism from school during menstruation & prolonged use of OCPs for treating primary dysmenorrhea (7). No prospective studies have been done continentally to determine the prevalence of such symptoms among adolescent girls. Therefore, such an embankment will be instrumental in identifying how common and severe pain symptoms suggestive of endometriosis are among the local adolescent population. Some documented effects include inability to go to work/school, unable to attend social functions or to perform her daily chores (8,9,10).

Majority of women with endometriosis report symptoms during adolescence yet it is a delayed diagnosis in our patient population. Given that endometriosis is felt to be a progressive disease with increasing morbidity over time, like, structural defects and infertility; the need of being aggressive in pursuing the diagnosis in adolescent is warranted.

MATERIALS AND METHODS

The study was conducted at Moi Girls High School Nairobi, (urban setting) and Githunguri Girls High School (rural setting) in Kenya. The study population was 154 Secondary school adolescent girls aged between 13 to 18 years in this school. Convenience sampling was done to select the two secondary schools to conduct the study. Stratified random sampling was then done to select the desired sample size of 154.First we categorized the students into age groups i.e. 13- 14yrs, 15-16yrs & 17-18yrs.The target in each group was 51. Therefore, depending on the total number per group, we assigned each student a random number from e.g. 1- 10. Then we randomly selected those with the number (n) to participate in the study. This was applied similarly in both schools.

The study variables were: Exposure variables- Age at menarche, menstrual characteristics (cycle length, duration of flow), use of analgesics/OCP & family history of endometriosis and outcome variables- presence or absence of pelvic/ pain with menses; dysuria, dyschezia &low back pain with menses; school absenteeism, school activity impairment & awareness of endometriosis.

Data collection was done using pre designed questionnaires with close-ended questions. The data collected was checked for completeness before being entered into MS Excel for validation. Thereafter it was transferred to SPSS Version 22.0 for analysis with the help of a qualified statistician. Descriptive statistics was used to describe the variables while inferential statistics was used to establish associations between endometriosis and the various explanatory factors using chi-square

while logistic progression was used to determine the predictors of adolescents with endometriosis like pains. P value of <0.05 was considered significant.

The study was undertaken after approval from the Department of Obstetrics &Gynecology and the K.N.H/U.O.N Ethics & Research Committee.

RESULTS

Three hundred and thirteen adolescents were interviewed with even distribution between rural (50.8%) and urban (49.2%) schools.

Table 1

Menstruation characteristics of the adolescents

Variable	Frequency (%)
School location Rural Urban	 159 (50.8) 154 (49.2)
Mean age at first periods (SD)	13.3 (1.1)
Have regular periods Yes No	 173 (55.3) 140 (44.7)
Days of bleeding with each period Mean (SD)	4.3 (1.3)
How heavy is the menstrual flow routinely Light Moderate Heavy Can't remember	40 (12.8) 228 (72.8) 37 (11.8) 8 (2.5)
Days in between periods <21 22-24 25-28 29-32 33-35 >36 Too irregular to say Missing	16 (5.1) 43 (13.7) 111 (35.5) 39 (12.5) 7 (2.2) 9 (2.9) 79 (25.2) 9 (2.9)

The mean age of onset of menarche was 13.3 years (SD 1.1 years). More than a half (55.3%) reported regular periods with a mean duration of 4.3 days. Menstrual flow was routinely moderate for 72.8% and heavy for 11.8% of the adolescents. The mean length of their menstrual cycles was 25-28 days reported in 35.5% of the students.

Table 2

Pattern of pain symptoms suggestive of endometriosis

Symptoms	Frequency (%)	Severity		
		Mild	Moderate	Severe
Dysmenorrhea	226 (72.2)	61 (27.0)	99 (31.6)	66 (29.2)
Dyschezia	62 (19.8)	41 (66.1)	12 (19.4)	9 (14.5)
Dysuria	36 (11.5)	32 (88.9)	2 (5.6)	2 (5.6)
Low back pain	137 (43.8)	68 (49.6)	45 (32.8)	24 (17.5)
Pain on upper legs/thighs	46 (14.7)			
Acyclic abdominal pain	62 (19.8)			

Almost three quarters (72.2%) of the adolescents had dysmenorrhea; in 27% it was mild, 31.6% moderate and 29.2% severe dysmenorrhea. Dyschezia was diagnosed in 19.8% of the girls, which was mainly mild in severity (66.1%). Fewer girls had dysuria (11.5%), which was mainly mild as reported in 88.9%. Lower back pain was reported by 42.8% of the girls while 14.7% reported pain on upper legs or thighs. Acyclic abdominal pain was reported in 19.8% of the girls.

Table 3

Impact of pain symptoms suggestive of endometriosis on the daily social activities

Variable	Frequency (%)
Frequency of pelvic pains during periods (n=226)	
Occasionally (1 in every 3 of my periods)	71 (31.4)
Often (2 in every 3 of my periods)	45 (19.9)
Always (with every period)	110 (48.7)
Impact of pelvic pains with periods on daily activities (n=226)	
Very painful that even though I take painkillers, I can't perform my daily activities	27 (11.9)
Very painful but am able to perform my daily activities after taking painkillers	69 (30.5)
Mild but bearable and subsides after 2nd day of menses	130 (57.5)
Miss attending classes more often during periods because of pain (n=226)	
Yes, I miss attending classes once or more times during that period	8 (3.5)
No, I attend but only after taking painkillers	71 (31.4)
Never miss class	147 (65.1)
Impact of acyclic abdominal pains on school activities	
Yes, and it makes me take painkillers	44 (14.1)
Yes, and I miss school during such occasion	3 (1.0)
Yes, and I miss school game activities	15 (4.8)
No	235 (75.1)
Feel pain in the lower belly exercising or engaging in school sport activity	
Yes	84 (26.8)
No	229 (73.2)

Majority (48.7%) of the girls who experienced dysmenorrhea got the pelvic pains always with every period while 31.4% experienced it occasionally. Most of the cases (57.5%) of dysmenorrhea were bearable. However, 30.5% of the girls had disruption of their daily activities until they used painkillers and 11.9% reported inability to perform daily activities even after taking painkillers. Though school activities were not disrupted in 65.1% of the girls who had dysmenorrhea, 3.5% missed classes at least once during their periods.

Acyclic abdominal pain disrupted school activities in 5.8% of the girls interviewed while 14.1% were forced to take painkillers to relief their pain. In addition, 26.8% feel pain in the lower belly during exercise or while engaging in school sport activity.

Table 4

Association between pain symptoms and severity of dysmenorrhea

Symptoms		**Severity of dysmenorrhea**		**P value**
	Mild	Moderate	Severe	
Dyschezia	16 (31.4)	13 (25.5)	22 (43.1)	0.007
Dysuria	12 (34.3)	8 (22.9)	15 (42.9)	0.022
Low back pain	23 (24.2)	39 (41.1)	33 (34.7)	0.291
Pain on upper legs/thighs	2 (5.6)	19 (52.8)	15 (41.7)	0.006
Acyclic abdominal pain	7 (13.5)	18 (34.6)	27 (51.9)	<0.001

Girls with severe dysmenorrhea reported significantly higher proportions of dyschezia (43.1%), dysuria (42.9%) and acyclic abdominal pain (51.9%). Similarly, pain on upper legs/ thighs was reported more by girls who had moderate (52.8%) and severe (41.7%) dysmenorrhea.

Table 5

Factors associated with dysmenorrhea

Variable		Dysmenorrhea	P value
	Yes (%)	No (%)	
Mean age at first period (SD)	13.2 (1.1)	13.4 (1.0)	0.272
Are your periods regular			
Yes	125 (55.6)	48 (56.5)	0.885
No	100 (44.4)	37 (43.5)	
Mean days of bleeding with each period (SD)	4.3 (1.3)	4.1 (1.1)	0.246
How heavy menstrual flow is routinely			
Light	21 (9.3)	19 (22.1)	0.003
Moderate	168 (74.3)	60 (69.8)	
Heavy	32 (14.2)	5 (5.8)	
Can't remember	5 (2.2)	2 (2.3)	
Number of days in-between periods			0.107
Less than 21days	11 (5.0)	5 (5.9)	
022-24days	24 (11.0)	19 (22.4)	
025-28days	84 (38.4)	27 (31.8)	
029-32days	30 (13.7)	9 (10.6)	
033-35days	5 (2.3)	2 (2.4)	
More than 36days	9 (4.1)	0	
Too irregular to say	56 (25.6)	23 (27.1)	
Ever taken contraceptives			
Yes	13 (5.8)	6 (6.9)	0.704
No	213 (94.2)	81 (93.1)	
Currently taking contraceptives			
Yes	8 (3.5)	2 (2.3)	0.576
No	218 (96.5)	85 (97.7)	
Ever taken contraceptive pills for painful periods			0.309
Yes	21 (9.3)	5 (5.7)	
No	205 (90.7)	82 (94.3)	
Currently taking contraceptives for painful periods			0.380
Yes	10 (4.4)	2 (2.3)	
No	216 (95.6)	85 (97.7)	
Miss school often due to painful periods			
Yes	7 (3.1)	1 (1.1)	0.002
No, I attend but after taking painkillers	62 (27.4)	9 (10.3)	
No	157 (69.5)	77 (88.5)	
Ever heard endometriosis before			
Yes	14 (6.2)	6 (6.9)	0.820
No	212 (93.8)	81 (93.1)	
History of endometriosis in the family			
Yes	10 (4.4)	2 (2.3)	0.692
No	169 (74.8)	29 (33.3)	

Factors associated with dysmenorrhea: Dysmenorrhea was significantly associated with heavy menstrual flow (p=0.003). Heavy menstrual flow was more likely to be reported by girls with dysmenorrhea (14.5%) while light flow was reported more by those without dysmenorrhea (22.6%). Also, those with dysmenorrhea were more likely to miss school (3.2%) or to attend after taking pain killers (27.6%), p=0.002.

Table 6

Awareness of endometriosis among adolescent study

Variable	Frequency (%)
Ever heard endometriosis before	
Yes	20 (6.4)
No	293 (93.6)
Any family history of endometriosis	
Yes	12 (3.8)
No	198 (63.3)
I don't know	103 (32.9)
Wish to receive more information about endometriosis	
Yes	220 (70.3)
No	93 (29.7)

A small proportion (6.4%) had heard of endometriosis and 3.8% had family history of endometriosis. Majority (70.3%) wished to receive more information on endometriosis

Table 7

Comparison between girls in the rural versus urban in relation to pain symptoms

Variable	Rural	Urban	OR (95% CI)	P value
Dysmenorrhea				
Yes	114 (70.0)	112 (70.4)	1.2 (0.7-2.0)	0.479
No	40 (30.0)	47 (29.6)	1.0	
Dyschezia				
Yes	42 (27.3)	20 (12.6)	2.6 (1.4-4.7)	0.001
No	112 (72.7)	139 (87.4)	1.0	
Dysuria				
Yes	30 (19.5)	6 (3.8)	6.2 (2.5-15.3)	<0.001
No	124 (80.5)	153 (96.2)	1.0	
Lower back pain				
Yes	70 (45.5)	67 (42.1)	1.1 (0.7-1.8)	0.554
No	84 (54.5)	92 (57.9)	1.0	
Upper thigh/leg pains				
Yes	23 (14.9)	23 (14.5)	1.0 (0.6-1.9)	0.907
No	131 (85.1)	136 (85.5)	1.0	
Acyclic abdominal pain				
Yes	40 (26.0)	22 (13.8)	2.2 (1.2-3.9)	0.007
No	114 (74.0)	137 (86.2)	1.0	

Pain symptoms in relation to rural versus urban population

Dyschezia was more frequent in girls in the rural school (67.7%) compared to the urban (p=0.001). Similarly, dysuria was reported more in the rural (83.3%) compared to 44.8% in the urban schools (p<0.001). The girls that reported acyclic abdominal pain were more likely to be from rural school (64.5%) than urban (45.4%), p=0.007. Dysmenorrhea, lower back pain and upper thighs and leg pains were not significantly different between the two groups.

DISCUSSION

Pain symptoms suggestive of endometriosis were very common among the adolescent girls. The prevalence of dysmenorrhea was found to be very high with more than 70% of the girls experiencing the pains. This prevalence was comparable to the magnitude reported in a study among Finnish girls that showed that 68% of them had dysmenorrhea (11). About a third of dysmenorrhea in this study was reported as severe which was comparable to those reported in other studies elsewhere (12,13,14).

One prior Australian study reported the rates of dysmenorrheal, dyschezia and dysuria in an adolescent population with rates similar to our study i.e. 68% vs. 72%, 12% vs. 19% and 10% vs. 11% respectively (17). Dysmenorrhea was associated significantly with other pain symptoms. The girls with dysmenorrhea had two-fold risk of experiencing dyschezia and acyclic abdominal pain; and more than 15 times odds of dysuria. In addition, dysmenorrhea was associated with heavy menstrual flows. Dyschezia was found in a fifth of the girls with about two thirds having mild symptoms. Dysuria was reported in 11.5% of the girls. Both symptoms were higher than 8% and 4.6% reported among Finnish girls respectively (11). On the other hand, acyclic abdominal pain reported in a fifth of the girls was comparable to 19.1% that was found in Finnish girls (11). Dyschezia, dysuria and acyclic abdominal pain were more prevalent among girls with the rural schools that the urban ones. In addition, acyclic abdominal pains occurred in girls with younger age at menarche and were more likely to report irregular and heavy periods. Other studies have reported young age at menarche to be contributory risk factors associated with endometriosis (15).

Use of contraceptive pills was reported among 6.1% of the girls and their main reason of use cited by 40.9% was to relieve the extremely painful periods. Furthermore, history of use of contraceptive pills was reported more frequently in those with acyclic abdominal pain and the current users who used it because of the painful periods. Also, girls with dyschezia were more likely to have ever used contraceptive pills. Finnish girls showed a higher use of contraceptive pills with 30.5% of the girls reporting current OC use and dysmenorrhea was the indication for 61.4% of the users (11).

Pain symptoms impacted negatively on the daily schoolwork and activities of the girls. Studies on endometriosis have documented effects that include inability to go to work or school, hindrance to participation in social functions (8,9,10,18). In this study, about a third of the girls who had dysmenorrhea had their daily activities disrupted due to the painful periods. Dysmenorrhea was significantly associated with increased risk of missing school and for some they would attend classes after taking painkillers.

The other symptoms that included dysuria, pain in the upper thighs and legs and acyclic abdominal pain were associated with higher likelihood of missing school. Absenteeism from school was less severe in this study as compared to Finnish study that reported a half of those with dysmenorrhea missing school (11).

Endometriosis awareness was very low with 6.4% having heard about and 3.8% reporting family history. Girls who had acyclic abdominal pain were more likely to be aware and also a higher proportion reported family history. Family history of endometriosis has been reported in previous studies to be associated with diagnosis of the condition (16).

CONCLUSIONS

Pain symptoms suggestive of endometriosis were quite common in the adolescent with prevalence rates similar to those in developed countries. These symptoms according to recent studies have a high index of being endometriosis but the awareness of the disease is low among the adolescent population studied. The severity of symptoms has been noted to impact negatively on schoolwork & activities especially when on no form of treatment.

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