East African Medical Journal Vol. 98 No. 8 August 2021
LAPAROSCOPIC DIAGNOSIS OF ENDOMETRIOSIS AT KENYATTA NATIONAL HOSPITAL, KENYA

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# LAPAROSCOPIC DIAGNOSIS OF ENDOMETRIOSIS AT KENYATTA NATIONAL HOSPITAL, KENYA

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## ABSTRACT

***Background*: Endometriosis constitutes a serious health issue due to its high affliction of 10% in reproductive age women and its clinical manifestation of infertility and chronic pelvic pain. Worldwide, there is clear documentation of the prevalence of endometriosis in the developed countries; however, the prevalence in black African woman is unknown.**

***Objective*: To determine the prevalence, pattern and clinical presentation of endometriosis in indigenous African women.**

***Design*: A prospective analytical cross-sectional study.**

***Setting*: Kenyatta National Hospital, Kenya between March 2018 and March 2021.**

***Subjects/Participants:* Indigenous African women aged 18 -49 years**

***Main Outcome Measures:* The prevalence of histological confirmed endometriosis and clinical presentation.**

***Results*: The prevalence of histological confirmed endometriosis in indigenous Africans was 4.6% ( 95% CI 0.5–18.4). Laparoscopic visualization diagnosis had a positive predictive value of 33%. Dysmenorrhoea, chronic pelvic pain scale 8-10, dyspareunia, nulliparity and menarche at 13 years and below were significant findings of endometriosis (P<0.001). Physical findings of adnexal tenderness and of nodules in the pouch of Douglas were significant in relation to endometriosis (P<0.001). The most common sites of the endometriosis implants were the Pouch of Douglas and the most common form of endometriosis was endometrioma (40%).**

***Conclusion*: The prevalence of endometriosis in Indigenous African woman is 4.6%. Nulliparity, menarche at the age of 13 and below, dysmenorrhoea, chronic pelvic pain scale 8-10 and dyspareunia were significantly associated with endometriosis. The most common site for endometriosis was the Pouch of Douglas whilst the most common form of endometriosis was endometrioma.**

## INTRODUCTION

Endometriosis is a female reproductive disorder, described as existence of endometriotic glands and stroma outside endometrial cavity, mainly in the pelvic peritoneum, ovary and recto-vaginal septum. Endometriosis afflicts 6%- 10% of women and it's symptomatology encompasses mainly chronic pelvic pain, dysmenorrhoea, dyspareunia and infertility; hence it is one of the most frequent gynaecological ailments [1,2,5.] In developed countries, there is explicit literature on the prevalence of endometriosis, however, in the developing world there is scanty documentations [3]. Despite of years of research, the causative factor and understanding of the ambidextrous endometriosis pathology remain elusive, perplex and disconnected[4]. The clinical appearance and locality of endometriosis is variable from one individual to another, and its clinical manifestation is divided into 3 categories: superficial peritoneal endometriosis, ovarian endometrioma and deep infiltrating endometriosis (DIE)[6]. Endometriotic superficial peritoneal lesions are variable; classic - blue-black (considered 'diagnostic') and non-classic or subtle-clear or white, yellowish brown, red like lesions have been illustrated[7]. By definition, the Indigenous African woman is the one living and born in Africa [3]. The current perspective is that indigenous African is rarely affected by endometriosis, however, in Black Africa the prevalence of endometriosis is not clearly defined [3]. In Indigenous African woman in Nigeria, the endometriosis prevalence was 4.3% and 8.2% in laparotomy and hysteroscopy specimen tissue [8,9]. In laparoscopy, the visualization of endometriosis with no histological authentication was reported to be 48.1% in university college, Ibadan, Nigeria (10). Early marriage with subsequent multiple pregnancies and breastfeeding and increased incidence of pelvic inflammatory disease have been postulated as the cause of low prevalence of endometriosis in Indigenous Africans [3]. The incidence of endometriosis is anticipated to increase with the westernization of lifestyle and change in social economic status of indigenous African woman. The presumptive low prevalence of endometriosis in black Africa could be due to diagnostic technique; lack of adequate laparoscopy amenities and lack of distinct training of the African gynaecologist could be a factor [3]. The understanding of endometriosis prevalence and the clinical pattern is critically essential in indigenous African woman with a view of the significant morbidity and public health complexities of this condition.

## MATERIALS AND METHODS

*Study Design*: This was an analytical cross-selection study whose primary outcome measure is the prevalence; pattern and clinical presentation of laparoscopic visually diagnosed and histological confirmed endometriosis in indigenous African woman.
*Study Setting*: The study was undertaken at Kenyatta National Hospital in Nairobi city, Kenya.
*Subjects /participants*: The study population was indigenous African women aged 18 -49 years undergoing laparoscopic surgery at Kenyatta National Hospital and all patients that meet the inclusion criteria were included in the study until the estimated sample size was achieved.
*Sample Size determination*: The sample size was determined by using the statistical formula of Fisher et al 2003 method. According to studies undertaken in similar settings, the prevalence of endometriosis has been reported to range from 5% - 10% (1). A conservative estimate of 10% that gives the largest possible sample size will be used for purposes of sample size calculation. The patients were reviewed pre- operatively for the history, clinical presentations and investigations. Operatively, Examination Under Anaesthesia (EUA) was performed

and any endometriotic lesion noted, hysteroscopy and laparoscopy were performed and the clinical findings noted. The laparoscopic surgeries were performed by the primary investigator or under his supervision. Wong /Baker face pain rating scale indicated below was used in pain assessment in this study [11]. The anatomical location and staging of the endometriosis was documented. The extent of the endometriosis was described using revised America Society for reproductive Medicine (Revised ASM) [6]. Subtle lesion that might represent endometriosis were excised even if endometriosis was not suspected. One to four biopsies was taken from each patient. Histological confirmation of endometriosis was done by staining samples with haematoxylin and eosin and this was performed by the pathologist at Kenyatta National Hospital.

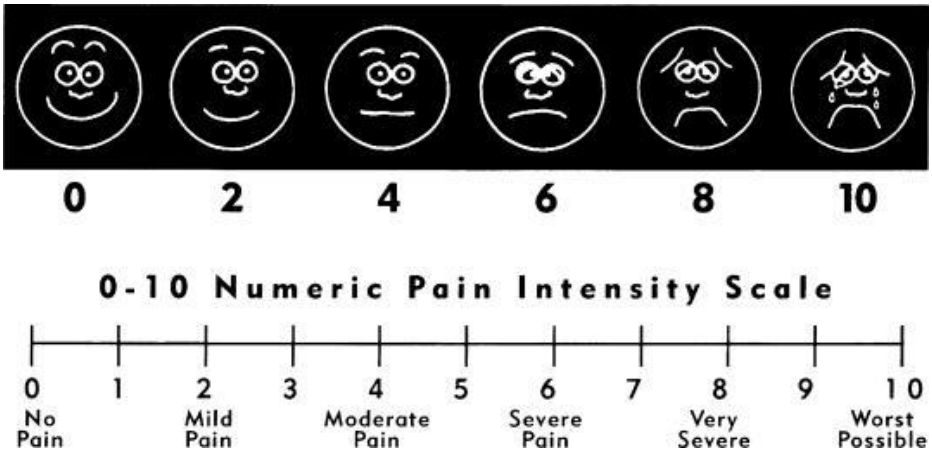


*Figure 1: Wong / Baker face pain rating scale*

*Data Collection*: A structured questionnaire was used to collect data by the clinician preparing the patient for surgery while completeness and follow-up for any missing information was done by the principle investigator. The data collection was to obtain the clinical presentation of endometriosis and the laparoscopic surgery findings. All data obtained from the questionnaire was verified and had double entered into a computer using Microsoft Access database.

*Data Analysis*: The data was analysed using Social SPSS version 22.0. The chi-square and logistic regression were used to determine the predictors of endometriosis among women undergoing laparoscopic surgery. P value of $< 0.05$ was considered significant.

*Ethical Consideration:* The study was reviewed and proved by the Kenyatta National Hospital/University of Nairobi Ethics Research Committee. Scientific content and compliance with applicable research and human subjects' regulations was observed. The respondents were informed about the study, its objectives, risks and benefits. The willing participants provided written consent.

## RESULTS

**Table 1**

*Socio Demographic Characteristics and Endometriosis Status (n=221)*

| Characteristics | Total, n (%) | Endometriosis, n (%) | No Endometriosis, n (%) | OR (95% CI) | P-value |
|---|---|---|---|---|---|
| Age | | | | | |
| ≤ 24 | | ] | | | |
| 25 – 29 | 13 (5.9) | 2 (20.0) | 11 (5.3) | 1 | - |
| 30 – 34 | 56 (25.6) | 3 (30.0) | 53 (25.4) | 3.2 (0.5-21.5) | 0.208 |
| ≥ 35 | 70 (32.0) | 4 (40.0) | 66 (31.6) | 3.0 (0.5-18.4) | 0.216 |
| | 80 (36.5) | 1 (10.0) | 79 (37.8) | 14.4 (1.2-171.9) | 0.007 |
| *Marital Status* | | | | | |
| Married | 171 (78.1) | 5 (50.0) | 166 (79.4) | 1 | |
| Separated | 27 (12.3) | 1 (10.0) | 26 (12.4) | 0.7 (0.1-6.9) | 0.826 |
| Single | 19 (8.7) | 4 (40.0) | 15 (7.2) | 0.1 (0.0-0.5) | <0.001 |
| Windowed | 2 (0.9) | - | 2 (1.0) | - | - |
| Occupation | | | | | |
| Employed | 91 (41.6) | 6 (60.0) | 85 (40.7) | 1 | |
| Self-Employed | 81 (37.0) | 2 (20.0) | 79 (37.8) | 2.8 (0.5-14.2) | 0.199 |
| Not Employed | 47 (21.5) | 2 (20.0) | 45 (21.5) | 1.6 (0.3-8.2) | 0.577 |

The mean age of all patients in the study was 33 years and there was no statistical difference between the patient with endometriosis and those without. The single women were significantly likely to have endometriosis (p<0.001). The women's occupation and level of education were not a factor in development of endometriosis.

**Table 2**

*Gynaecological History and Endometriosis Status (n=221)*

| Characteristics | Total, n (%) | Endometriosis, n (%) | No Endometriosis, n (%) | OR (95% CI) | P-value |
|---|---|---|---|---|---|
| Parity | | | | | |
| 0 | 101 (46.1) | 7 (70.0) | 94 (45.0) | - | - |
| 1 | 46 (21.0) | 2 (20.0) | 44 (21.1) | 1 | 0.001 |
| 2 | 29 (13.2) | 1 (10.0) | 28 (13.4) | 1.6 (0.3-8.2) | 0.544 |
| ≥ 3 | 43 (19.6) | - | 43 (20.6) | 2.1 (0.2-17.6) | 0.492 |
| No. of Abortions | | | | | |
| None | [158 (72.1) | [0-1] | [0-5] | - | - |
| 1 - 3 | 58(26.5) | 9 (90.0) | 149 (71.3) | 1 | 0.218 |
| 4+ | 3 (1.4) | 1 (10.0) | 57 (27.3) | 3.4 (0.4-27.8) | - |
| Age at Menarche (Yrs.) | | | | | |
| 10-12 | 50 (22.8) | 5(50.0) | 45 (21.5) | - | 0.001 |
| 13-15 | 167 (76.3) | 5 (50.0) | 162 (77.5) | 1 | |
| 16+ | 2 (0.9) | - | 2 (1.0) | 3.6 (0.9-12.9) | 0.038 |
| Duration of Flow in days | | | | | |
| 0-3 | 22 (10.0) | 0 | 22 (10.5) | - | - |
| 4-7 | 180 (82.2) | 0 | 170 (81.3) | - | - |
| 8+ | 17 (7.8) | 10 (100.0) | 17 (8.1) | 1 | 0.165 |
| Menorrhea | 22 (10.0) | - | 22 (10.5) | - | - |
| Dysmenorrhea | 47 (21.5) | 8 (80.0) | 39 (18.7) | 17.4 (3.6-85.3) | <0.001 |

Nulliparous patients were significantly at risk of having endometriosis p<0.001. The number of abortions did not significantly influence the occurrence of endometriosis, p=0.218. Duration of the flow and the menorrhagia were not significant factors in the prevalence of the endometriosis. Dysmenorrhoea was a significant symptom of endometriosis p<0.001. The patients with menarche at 13 years and below had a significant risk of having endometriosis p=0.001.

**Table 3**

*Clinical presentation versus endometriosis status (n=221)*

| Characteristics | Total, n (%) | Endometriosis, n (%) | No Endometriosis, n (%) | OR (95% CI) | P-value |
|---|---|---|---|---|---|
| Lower Abdominal Tenderness | 55 (25.1) | 6 (60.0) | 49 (23.4) | 4.9 (1.3-18.1) | 0.009 |
| Pelvic Mass | 25 (11.4) | - | 25 (12.0) | - | - |
| Adnexal Mass | 32 (14.6) | 2 (20.0) | 30 (14.4) | 1.5 (0.3-7.4) | 0.621 |
| Adnexal Mass Tenderness | 21 (9.6) | 1 (10.0) | 20 (9.6) | 1.1 (0.1-8.7) | 0.964 |
| Extroverted Uterus | 8 (3.7) | 1 (10.0) | 7 (3.3) | 3.2 (0.4-28.9) | 0.273 |
| Nodules P.O.D | 3 (1.4) | 2 (20.0) | 1 (0.5) | 52.0 (4.3-634.9) | <0.001 |
| Normal Findings | 104 (47.5) | 2 (20.0) | 102 (48.8) | 0.3 (0.1-1.3) | 0.074 |
| Characteristics | Total, n (%) | Endometriosis, n (%) | No Endometriosis, n (%) | OR (95% CI) | P-value |
| Dysmenorrhea | 47 (21.4) | 12 (83.3) | 35 (16.9) | 24.5 (9.1-66.2) | <0.001 |
| Chronic Pelvic Pain | 71 (34.3) | 13 (86.7) | 63 (30.5) | 14.8 (5.1-43.3) | <0.001 |
| Scale of Pain | | | | | |
| 0 | 3 (4.0) | 0 | 3 (4.8) | | |
| 1 – 3 | 34 (45.3) | 2 (19.2) | 32(50.8) | 1 | |
| 4 – 7 | 29 (38.7) | 4 (34.6) | 25(39.5) | 0.4 (0.1-1.4) | 0.146 |
| 8 - 10 | 9 (12.0) | 6 (46.2) | 3 (4.8) | 0.01 (0.0-0.2) | <0.001 |
| Dyspareunia | 24 (11.7) | 5 (36.7) | 20 (9.9) | 5.3 (2.3-11.8) | <0.001 |
| Pelvic Congestion | 33 (15.1) | 2 (16.7) | 31 (15.0) | 1.1 (0.4-3.1) | 0.807 |
| Low Back Pain | 30 (13.8) | 3(20.0) | 27 (13.3) | 1.6 (0.6-4.2) | 0.306 |
| Characteristics | Total, n (%) | Endometriosis, n (%) | No Endometriosis, n (%) | OR (95% CI) | P-value |
| Infertility | | | | | |
| None | 120 (54.2) | 4 (50.0) | 1118 (54.5) | | |
| Primary | 54 (24.4) | 4 (40.0) | 48 (32.2) | 1 | |
| Secondary | 47 (21.4) | 2 (10.0) | 47 (22.3) | 3.8 (1.0-14.0) | 0.031 |
| Overall, | 221 (100.0) | 10 (100.0) | 211 (100.0) | | |

Physical findings on clinical examination of lower abdominal tenderness, pelvic mass and extroverted uterus were not significantly related to the endometriosis, however, adnexal tenderness and findings of nodules in the pouch of Douglas were significant in relation to endometriosis, p<0.001.The sites of the endometriosis implants were on the Pouch of Douglas (30%), Unilateral ovaries (23.3%), uterosacral (20%), posterior uterus (6.7%), Bilateral ovaries (6.7%), Anterior uterus (6.7%), Gut (3.3%) and extra pelvic site

(3.3%). Patients with endometriosis had 50% infertility, however, there was no correlation between infertility and endometriosis p=0.031.

**Table 4**

*Intra-operative and histological*

| **Signs of Endometriosis** | | **n** | **%** |
|---|---|---|---|
| Puckered blue-black | | 2 | 20.0 |
| Powder-burned appearance | | 3 | 30.0 |
| Subtle (Popular, Glandular, vesicular) | | 1 | 10.0 |
| Haemorrhagic (Red vesicular or Flame-like) | | 3 | 30.0 |
| Fibrotic lesions (White to black pigmented). | | 3 | 30.0 |
| Chocolate cyst/endometrioma. | | 2 | 40.0 |
| Deep Infiltrating Endometriosis | | 2 | 30.0 |
| Extra pelvic | | 1 | 10.0 |
| **Anatomic site of endometriosis** | | **n** | **%** |
| Anterior uterine | | 1 | 10.0 |
| Extra pelvic site | | 1 | 10.0 |
| Gut | | 1 | 10.0 |
| Bilateral ovaries | | 1 | 10.0 |
| Posterior uterus | | 3 | 30.0 |
| Pouch of Douglas | | 3 | 30.0 |
| Utero-sacral ligaments | | 2 | 20.0 |
| Unilateral ovary | | 1 | 10.0 |
| **Histological findings on tissue pathology** | | **n** | **%** |
| | Adenomyosis | 4 | 2.0 |
| | Appendicitis | 2 | 1.1 |
| | Cervical dysplasia | 1 | 1.0 |
| | | | |
| | Confirmed histological endometriosis | 10 | 4.6 |
| | Ectopic pregnancy | 1 | 1.0 |
| | Endometrial hyperplasia | 1 | .1.0 |
| | Fallopian tubes | 11 | 5.0 |
| | Myoma | 22 | 10.0 |
| | | | |
| | No pathology or no biopsy taken | 150 | 68.2 |
| | Ovarian cyst | 22 | 10.0 |
| | Ovarian malignancy | 2 | 2.0 |
| | Teratoma | 2 | 1.1 |

The most common form of presentation in superficial endometriosis was powder-burned appearance (33%) followed by fibrotic lesions (White to black pigmented), (30%), puckered blue-black (20%), subtle (10%) whilst endometrioma and deep infiltrating endometriosis accounted for 26.7% The sites of the endometriosis implants were on the Pouch of Douglas (30%), Unilateral ovaries (23.3%), uterosacral (20%), posterior uterus (6.7%), Bilateral ovaries (6.7%), Anterior uterus (6.7%), Gut (3.3%) and extra pelvic site (3.3%). The prevalence of histological confirmed endometriosis was 4.6% (95% CI 0.5–18.4), however the most common pathology was myoma (19.9%) and 44.2% had no biopsy taken or pathology
detected histologically.

## DISCUSSION

The mean age of the 443 patients recruited was 33.3 years +/- 6 years (SD) and there was no statistical difference between the patient with endometriosis and those without. The prevalence of histological confirmed endometriosis was 4.6% (95% CI 0.5–18.4), however, the most common pathology was myoma (19.9%) and 44.2% of the patients had no pathology detected. The prevalence of endometriosis has been speculated to be as high as 10% of the women of reproductive age, however, this study did not concur [12]. The low prevalence of endometriosis may be due to the fact that 44.2 % of the patients had no pathological findings or no biopsy was taken due to non-identifiable pathology; the main reason for laparoscopy surgery at the Kenyatta National hospital was tubal blockage. The findings in this study are consisted with a study in Nigeria, where endometriosis in 2 communities of Igbo and Hausa/Fulani was found to be 4.3% and 8.2% respectively from hysterectomy and laparotomy specimen, which had histological confirmation of endometriosis [8,9]. This study was not consisted with another Nigerian study in Ibadan where the prevalence of endometriosis was found to be 48.8% with the diagnosis criteria for endometriosis being laparoscopic visualization without histological confirmation [10]. Our study was also not consisted with Chapman's laparoscopic studies, where he found prevalence of endometriosis with histological confirmation to be 21% in women who had had pelvic inflammatory disease treatment in African American women [13].

Nulliparous patients significantly had a risk of having endometriosis p<0.001 (Table 2). Prolonged uninterrupted menstruation like in nulliparous or in menorrhagic women or menstruation with less than 27 days cycle and usage of tampons may predispose to development of endometriosis [14]. The number of abortions did not significantly influence the occurrence of endometriosis. Duration of the flow was also not a significant factor in the prevalence of the endometriosis in this study (Table 2). However, epidemiological studies have demonstrated that short menstrual cycle and prolonged menstruation are risk factors in the development of endometriosis [15,16].

The symptoms of dysmenorrhoea, Chronic pelvic pain scale 8-10 and dyspareunia were significant findings in endometriosis p<0.001 (Table 3). There is a positive relationship between endometriosis with chronic pelvic pain and dysmenorrhoea and the two have been associated with increased risk of endometriosis [17]. Menorrhagia had no significant correlation with endometriosis in this study P=0.088 (Table 3). The patients with menarche at 13 years and below had a significant risk of having endometriosis p=0.001 than those with menarche above the age of 13 years (Table 2). Literature has indicated a positive relationship between early menarche and endometriosis [17].

Patients with endometriosis had 60% infertility, however, there was no correlation between infertility and endometriosis (p=0.031), whilst the prevalence of infertility in women without endometriosis was 40.7% (Table 3). In two studies, the prevalence of infertility in laparoscopic diagnosed endometriosis was found to be 38.5% and 25-40% compared to fertile one of 5.2% and 0.5-5% respectively [18]. Other literature has shown occurrence of 5-50% of infertility in endometriosis; it has also documented that infertility is 6-8 times more likely to occur in endometriosis than in fertile women [14,19]. In this study, patients with endometrioma and deep infiltrating endometriosis were more like to have infertility than those with superficial endometriosis although not statistically significant. The above finds are consisted with literature which shows that infertility in women with endometriosis is most likely to occur in the advanced stage of the disease [2].

The sites of the endometriosis implants were on the Pouch of Douglas (30%),

Unilateral ovaries (10%), uterosacral (20%), posterior uterus (30%), Bilateral ovaries (10%), Anterior uterus (19%), Gut (10%) and extra pelvic site (10%) (Table 4). These findings are consisted with the literature that endometriosis occurs more frequently on structures adjacent to the fallopian tube ostia, that is the pouch of Douglas, utero-sacral ligaments and the ovaries, offering credence to the hypothesis of retrograde menstruation [18]. Endometrial implants are also more likely to attach themselves in the posterior uterus in the African American rather than interiorly [13,20].

The majority of the histological confirmed endometriosis were superficial endometriosis (30%), with ovarian endometrioma (40%) and deep infiltrating endometriosis (30%). The most common form of presentation in superficial endometriosis were powder blue-burned appearance (30%), fibrotic lesions (30%), puckered blue-black (20%), Haemorrhagic (30%) and subtle (10%) (Table 4).

*Study limitations:* The study population was limited to laparoscopic gynaecological patients only, which was highly selective. The histological information of endometriosis was limited by technical efficiency in endometriotic biopsy sampling and processing and by the factor that there were multiple pathologists involved.

## CONCLUSION

The histological confirmed endometriosis for the study was 4.6% (95% CI 0.5–18.4). Dysmenorrhoea, chronic pelvic pain scale 8-10 and dyspareunia were significant symptoms of endometriosis. Nulliparous patients significantly had a risk of having endometriosis p<0.001. The patients with menarche at 13 years and below had a significant risk of having endometriosis p=0.001. The common sites of the endometriosis implants were on the Pouch of Douglas. The majority of the histological confirmed endometriosis were ovarian endometrioma (40%), with superficial endometriosis and deep infiltrating endometrioma each having (30%). It is imperative to have multicentred study among indigenous Africans to clearly define the clinical pattern of endometriosis. Endometriosis is a significant public health issue requiring increased surveillance, clinical awareness and management.

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