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Risk Factors And Clinical Presentation Of Gynecological Cancers Among Women Attending Tertiary Referral Hospitals In Khartoum State, Sudan

Sahar Elhawari 1, Amani Elgaili2, Fath Elrahman Elrasheed3, Sarra Nasreldin4, Lubna Bashier 5, Ahmed Zakaria6, Raja Mahmoud 7, Elwaleed Elhaj8, Awadalla Abdelwahid9

1Department of Obstetrics and Gynecology, University of Khartoum, Khartoum, Sudan.
2 Department of Obstetrics and Gynecology, NMC Specialty Hospital, Abu Dhabi, United Arab Emarat
3Department of Obstetrics and Gynecology, Faculty of Medicine, Najran University, Saudi Arabia
4Consultant of Obstetrics and Gynecology, Sudan Medical Specialization Board, Khartoum, Sudan.
5Department of Obstetrics and Gynecology, King Salman Medical City, Madinah Munawera, Saudi Arabia.
6 Department of Obstetrics and Gynecology, Sudan University of Science and Technology, Khartoum, Sudan
7 Consultant of Obstetrics and Gynecology, Life Road Polyclinic, Makkah, Saudia Arabia.
8 Consultant Obstetrics and Gynecology, Alfarsha General Hospital, Aseer, Saudi Arabia.
9 Department of Obstetrics and Gynecology, Alneelain University, Khartoum, Sudan

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Abstract

Introduction: The incidence of gynecological cancers is rising, likely due to increasing obesity, aging populations, and lifestyle changes. In Sudan, women's cancer-related mortality receives limited attention due to underreporting.

Objectives: To investigate risk factors, presenting symptoms, and signs of gynecological cancers.

Methods: A descriptive, cross-sectional hospital-based study was conducted at Soba University Hospital, Omdurman Military Hospital and Khartoum North Teaching Hospital from October 2017 to April 2018. A total of 120 women were enrolled.

Results: Ovarian cancer was the most common (56.7%), followed by uterine (24.2%), cervical (20.8%) and vulvar (3.3%). Nearly half were from central Sudan (43.3%). Family history of gynecological cancer was a major risk factor (28.3%). Ovarian cancer was significantly linked to breast cancer history. Uterine cancer was associated with high BMI (43.3%) and diabetes (72.4%). Cervical cancer correlated with early marriage (64.0%), high parity and low socioeconomic status (84.0%). Clinically, ovarian cancer presented with abdominal pain (82.4%), uterine with postmenopausal bleeding (79.3%), and cervical with bleeding and discharge (76.0%).

Conclusions: Ovarian cancer was the most common, with strong familial associations. Uterine and cervical cancers were tied to metabolic and reproductive risks. Bleeding and abdominal symptoms were the predominant clinical features.

Key words: Gynecological cancer, ovarian, endometrial, cervical, vulvar, risk factors

Introduction

Cancer is a leading cause of death worldwide, so it is growing public health concern across Africa, with a substantial rise in both incidence and mortality in recent decades. This is due to largely driven by demographic shifts, including population aging and expansion, as well as lifestyle transitions linked to socioeconomic development. Increasing tobacco use, poor dietary habits and physical inactivity are among the major contributing factors to this burden [1-2].

Despite its rising incidence and mortality, cancer continues to receive limited attention as a public health priority across much of Africa, including Sudan. This marginalization is partly driven by constrained healthcare resources and the ongoing burden of communicable diseases such as malaria, tuberculosis and HIV/AIDS. Compounding the issue is a widespread lack of awareness among both policymakers and the general public regarding the current and projected impact of cancer, which hinders strategic planning and timely intervention [3]. The ongoing conflict in Sudan has further exacerbated these issues, severely disrupting healthcare infrastructure, displacing populations, and restricting access to essential medical services. These conditions not only hinder early detection and treatment of cancer but also compromise long-term planning and the implementation of effective national cancer control strategies.

Gynecologic oncology is a medical specialty dedicated to the diagnosis and treatment of cancers affecting the female reproductive system, such as ovarian, uterine, vaginal, cervical, and vulvar cancers [3-6]. Specialists in this field undergo advanced training to manage these conditions through surgery, chemotherapy and radiotherapy [7-8].

The first National Cancer Registry in Sudan, initiated in 1967, was discontinued in the early 1980s due to funding limitations. Subsequently, cancer data relied on histopathology reports from the University of Khartoum and the National Health Laboratories, serving nationwide diagnostic needs [9-10].

In 2009, Sudan launched a population-based cancer registry in Khartoum to gather and centralize data, aiming to expand regional registries across all 14 states [11].

Environmental and social factors have contributed to rising cancer rates in central Sudan, particularly in areas with heavy pesticide use in the Gezira agricultural scheme [12]. While few studies have examined risks from smoking and nutrition, molecular research remains limited. Emerging data suggest links to oncogenes, tumor suppressor genes and viral infections [13-15].

Documented data on cancer incidence in Sudan, particularly gynecological cancers and their risk factors, remains scarce. Given the burden on women—central to family and community life—the consequences extend to caregivers and place substantial demands on already strained healthcare resources and services.

Methods

This was a prospective, descriptive, cross-sectional hospital-based study, conducted from October 2017 to April 2018 across Soba University Hospital, Khartoum North Teaching Hospital, and Omdurman Military Hospital—all serving as tertiary referral centers for obstetrics and gynecology in Sudan.

Study Population Participants were women who presented to the referral clinics at the three hospitals during the study period and were diagnosed with one of the following gynecological cancers: ovarian, cervical, endometrial, or vulvar cancer. Diagnosis was confirmed by histopathological examination. Only those who provided written informed consent were enrolled; patients who declined participation were excluded.

Sampling Technique The study used total coverage sampling, enrolling all eligible cases attending the selected

hospitals during the study period.

Study Variables

Independent variables: Sociodemographic characteristics (age, education, employment status, marital status)
Dependent variables: Type of gynecological cancer (ovarian, cervical, uterine, vulvar), associated risk factors (obesity, smoking, HRT, age at menarche/menopause), and presenting symptoms (e.g., abdominal/pelvic pain, nausea, vomiting, dyspareunia, vaginal bleeding, discharge, itching, ulceration, skin changes).

Data Collection Procedure A structured, pre-tested questionnaire was completed via direct interview by trained research colleagues. Participants were fully informed about the study purpose, consented voluntarily, and interviewed privately to ensure comfort and confidentiality. Secondary data were obtained from hospital records, laboratory results, and literature sources including books, journals, and credible online databases.
Data Analysis Collected data were coded, entered, and analyzed by a qualified statistician using SPSS version 25. Descriptive statistics (frequencies, percentages, tables, figures) were employed, and analytical assessments conducted via Chi-square tests, with significance set at $p < 0.05$ and a 95% confidence interval.
Ethical Considerations Ethical approval was secured from the Sudan Medical Specialization Board, Council of Obstetrics and Gynecology. Formal permission was obtained from the medical directors of participating hospitals. Informed consent was taken prior to participation, and confidentiality was ensured through coded questionnaires. No interventions beyond standard clinical practice were introduced, and participants retained full rights to withdraw at any stage.

Results

In this study, a total of 120 ladies at referral clinic at Soba University Hospital, Khartoum North Teaching Hospital and Omdurman Military Hospital in the period from October 2017 to April 2018 with gynecological cancer were evaluated to determine the risk factors and presentation of gynecological cancers among them. Sociodemographic characteristics of the Study Population (n = 120). According to age distribution, 10 (8.3%) women were in the 20–29 years group, 19 (15.8%) in the 30–39 years group, 32 (26.7%) in the 40–49 years group, and 59 (49.2%) were aged 50 years or above. Regarding marital status, the majority—79 (65.8%)—were married, while 24 (20.0%) were divorced or widowed, and 17 (14.2%) were single. Educational attainment showed that 44 (36.7%) women had completed primary school, 17 (14.2%) had attained secondary education, 8 (6.7%) had completed university education, while 51 (42.5%) had no formal education. Occupationally, 112 (93.3%) women were not employed, and only 8 (6.7%) were employed at the time of data collection. Parity levels indicated that 36 (30.0%) of the women were nulliparous, 38 (31.7%) had between one and four children, and 46 (38.3%) had five or more children. Table (1).
Ovarian cancer, the most frequent malignancy among participants, displayed a broad range of symptoms. Abdominal and/or pelvic pain was the most predominant complaint, reported by 56 women (82.4%) with statistical significance ($p = 0.001$). Nausea was the second most common symptom (32 women, 47.1%), followed by abdominal distention (19, 27.9%), vomiting (15, 22.1%), and constipation (10, 14.7%). Vaginal symptoms such as abnormal bleeding were noted in 15 patients (22.1%), while dyspareunia (4, 5.9%) and diarrhoea (2, 2.9%) were less frequent but still clinically relevant. Endometrial cancer ranked second in prevalence and was primarily associated with postmenopausal bleeding, affecting 23 women (79.3%), a statistically significant

association (p = 0.002). Heavy irregular vaginal bleeding occurred in 6 cases (20.7%), indicating potential hormonal imbalance or local invasion. Cervical cancer, comprising 20.8% of cases, was characterized mainly by postmenopausal bleeding and excessive vaginal discharge, both affecting 19 women (76.0%, p < 0.001). Postcoital bleeding and dyspareunia were observed in 4 women each (16.0%), reflecting cervical mucosal involvement. Vulvar cancer, although rare, had highly specific presentations: all four affected patients (100%) reported itching, ulcerations, and skin discoloration. Wart-like lumps were noted in two cases (50.0%). Due to the small sample, statistical testing was not applied to these symptoms. Table (2).

Among the cancer types observed, ovarian cancer was the most prevalent, affecting 68 women (56.7%), followed by uterine cancer in 29 (24.2%), cervical cancer in 25 (20.8%), and vulvar cancer in 4 (3.3%). Additionally, 6 women (5.0%) presented with a combination of two gynecological malignancies (Figure 1).

Geographically, 52 (43.3%) participants originated from central Sudan, 35 (29.2%) from the western region, 28 (23.3%) from northern Sudan, 4 (3.3%) from the east, and 1 (0.8%) from Khartoum (Figure 2). Regarding body mass index, 52 women (43.3%) had BMI values between 25–29.9 kg/m², 47 (39.2%) ranged from 19–24.9 kg/m², 15 (12.5%) had BMI <19 kg/m², and 6 (5.0%) had BMI ≥30 kg/m² (Figure 3). Almost all participants were non-smokers (99.2%), with only one woman (0.8%) reporting tobacco use. Fourteen women (11.7%) had a personal history of cancer: 4 with breast cancer, 6 with other gynecologic cancers, and 4 with colorectal cancer.

A family history of gynecological cancer was reported by 34 women (28.3%), while 86 (71.7%) had no such history (Figure 4). Similarly, 32 women (26.7%) had family history of other gynecological cancers, while 88 (73.3%) did not (Figure 5).

These findings underscore the need for enhanced awareness, early screening, and tailored interventions targeting high-risk groups.

Risk factors and clinical features among women diagnosed with gynecological cancer in this study (n = 120). A family history of malignancy was reported by a minority of participants: 13 women (10.8%) had a family history of breast cancer, and 3 women (2.5%) had a family history of gastrointestinal cancers, while the remaining 104 (86.7%) had no reported familial cancer history. Only 16 women (13.3%) reported any use of contraceptives. Among those, 12 (75.0%) had used combined oral contraceptive pills (COCPs), 2 (12.5%) used progesterone-only pills, and 2 (12.5%) used intrauterine contraceptive devices (IUCDs). The vast majority—104 women (86.7%)—reported no history of contraceptive use. Hormonal therapy use was minimal, with only 1 woman (0.8%) receiving hormone replacement therapy (HRT), while 119 women (99.2%) had never received HRT.

Regarding symptom duration before presentation, 81 women (67.5%) presented within six months of symptom onset, 32 (26.7%) presented between 7–12 months, and 7 (5.8%) presented after more than one year. Among ovarian cancer patients (n = 68), 19 (27.9%) reported a family history of ovarian cancer, while 49 (72.1%) had no such history. Table (3).

There was statistically significant association Regarding menopausal status, 13 participants (44.8%) had menopause between 50 and 59 years, while 16 (55.2%) reached menopause outside this range. Exposure to tamoxifen was reported in 4 patients (13.8%), and estrogen therapy was used by 2 (6.9%). The majority had not received hormonal treatments.

A notable proportion—21 women (72.4%)—were diabetic, and 8 (27.6%) had hypertension. The remaining participants did not report either condition.

In terms of clinical presentation, postmenopausal bleeding was the predominant symptom, affecting 23 patients

(79.3%), reinforcing its role as a key indicator of endometrial pathology. An additional 6 women (20.7%) presented with heavy irregular vaginal bleeding, often indicative of hormonal imbalance or endometrial disruption.

These findings underscore a strong association between endometrial cancer and factors such as early menarche, PCOS, diabetes, and postmenopausal bleeding—highlighting areas for targeted screening and preventive strategies in at-risk women. Table (4).

adjusted predictors for ovarian, endometrial, cervical, and vulvar cancers among the study population. For ovarian cancer, abdominal or pelvic pain was the strongest independent predictor (AOR: 4.92; 95% CI: 1.86–13.04; p = 0.001), followed by gastrointestinal symptoms such as nausea, distention, or constipation (AOR: 3.15; 95% CI: 1.27–7.83; p = 0.013). A family history of ovarian cancer was also significant (AOR: 2.35; 95% CI: 1.01–5.46; p = 0.047), whereas abnormal vaginal bleeding approached significance in a protective direction (AOR: 0.41; p = 0.064).

For endometrial cancer, key predictors included postmenopausal bleeding (AOR: 6.02; 95% CI: 1.94–18.74; p = 0.002), BMI ≥ 25 kg/m² (AOR: 4.22; 95% CI: 1.64–10.84; p = 0.002), diabetes mellitus (AOR: 3.88; 95% CI: 1.34–11.26; p = 0.013), and PCOS (AOR: 2.78; 95% CI: 1.00–7.72; p = 0.049). Tamoxifen use was not statistically significant.

In cervical cancer, excessive vaginal discharge was a strong predictor (AOR: 3.90; 95% CI: 1.55–9.80; p = 0.004), while postcoital bleeding (AOR: 2.35) and multiparity ≥ 5 (AOR: 1.78) were not statistically significant but suggest potential associations.

For vulvar cancer, skin color changes emerged as a highly significant predictor (AOR: 6.45; 95% CI: 1.92–21.66; p = 0.002), followed by wart-like lesions (AOR: 3.28; p = 0.086) and age ≥ 60 years (AOR: 2.90; p = 0.044). Table (5).

Table 1: Demographic characteristics of Women with gynecological cancer (n=120)

Demographic characteristics	Frequency	Percentage
Age		
20-29	**10**	8.3
30-39	19	15.8
40-49	32	26.7
≥ 50	59	59.2
Education level		
Illiterate	51	42.5
Primary school	44	36.7
Secondary school	17	14.2
University	8	6.7
Marital status		
Single	17	14.2
Married	79	65.8
Divorced or widowed	24	20.0
Employ status		
Not Employee	112	93.3
Employee	8	6.7%

Parity		
Nullipara	36	30.0
1- 4	38	31.7
≥ 5	46	38.3
Total	**120**	**100.0**

Table (2): Gynecological Cancer Presenting symptoms of study population (n=120)

Cancer Presenting symptoms	Frequency	Percentage%	P-value
Ovarian Cancer			
Abdominal pain and/or pelvic pain	56	82.4	0.001
Nausea	32	47.1	
Abdominal distention	19	27.9	
Vomiting	15	22.1	
Abnormal vaginal bleeding	15	22.1	
Constipation	10	14.7	
Dyspareunia	4	5.9	
Diarrhea	2	2.9	
Endometrial cancer			
Postmenopausal bleeding	23	79.3	0.002
Heavy irregular vaginal bleeding	6	20.7	
Cervical cancer			
Postmenopausal bleeding	19	76.0	0.000
Excessive vaginal discharge	19	76.0	0.000
Postcoital bleeding	4	16.0	
Dyspareunia	4	16.0	
Vulvar cancer			
Itching	4	100.0	
Ulcerations	4	100.0	
Change in skin color	4	100.0	
Wart like lumps	2	50.0	
Total	**120**	**100.0**	

Table (3): Risk factors and clinical features among women diagnosed with gynecological cancer

Variable Category	Subcategory	Frequency (n)	Percentage (%)
Family History	Breast cancer	13	10.8
	Gastrointestinal cancer	3	2.5
	No such history	104	86.7
Contraceptive Use	Any contraceptive use	16	13.3
	– COCP users	12	75.0
	– Progesterone only	2	12.5
	– IUCD	2	12.5
	No contraceptive use	104	86.7
Hormonal Therapy	Received HRT	1	0.8

Variable Category	Subcategory	Frequency (n)	Percentage (%)
	Did not receive HRT	119	99.2
Symptom Duration	≤ 6 months	81	67.5
	7–12 months	32	26.7
	> 12 months	7	5.8
Ovarian Cancer Subgroup	Family history of ovarian cancer	19	27.9
	No family history of ovarian cancer	49	72.1

Table (4): Risk Factor Profile Among Women Diagnosed with Endometrial Cancer (n = 29)

Variable	Category	Frequency (n)	Percentage (%)
Polycystic Ovary Syndrome (PCOS)	Yes	14	48.3
	No	15	51.7
Menarche Age	10–12 years	15	51.7
	>12 years	14	48.3
Menopause Age	50–59 years	13	44.8
	Other	16	55.2
Tamoxifen Use	Yes	4	13.8
	No	25	86.2
Estrogen Therapy	Yes	2	6.9
	No	27	93.1
Diabetes Mellitus	Yes	21	72.4
	No	8	27.6
Hypertension	Yes	8	27.6
	No	21	72.4
Presenting Symptom	Postmenopausal bleeding	23	79.3
	Heavy irregular vaginal bleeding	6	20.7

Table (5): Binary Logistic Regression: Adjusted Predictors of Gynecological Cancer Types

Cancer Type	Predictor Variable	Adjusted OR	95% CI	P Value
Ovarian Cancer	Abdominal/pelvic pain	4.92	1.86 – 13.04	**0.001**
	Gastrointestinal symptoms	3.15	1.27 – 7.83	**0.013**
	Family history of ovarian cancer	2.35	1.01 – 5.46	**0.047**
	Abnormal vaginal bleeding	0.41	0.16 – 1.05	0.064
	Nulliparity	1.20	0.61 – 2.37	0.600
Endometrial Cancer	Diabetes mellitus	3.88	1.34 – 11.26	**0.013**
	BMI ≥ 25 kg/m²	4.22	1.64 – 10.84	**0.002**

Cancer Type	Predictor Variable	Adjusted OR	95% CI	P Value
	PCOS	2.78	1.00 – 7.72	**0.049**
	Postmenopausal bleeding	6.02	1.94 – 18.74	**0.002**
	Tamoxifen use	1.95	0.50 – 7.60	0.330
Cervical Cancer	Excessive vaginal discharge	3.90	1.55 – 9.80	**0.004**
	Postcoital bleeding	2.35	0.72 – 7.62	0.154
	Multiparity (≥5)	1.78	0.95 – 3.34	0.071
Vulvar Cancer	Skin color change	6.45	1.92 – 21.66	**0.002**
	Wart-like lumps	3.28	0.84 – 12.83	0.086
	Age ≥ 60 years	2.90	1.03 – 8.10	**0.044**

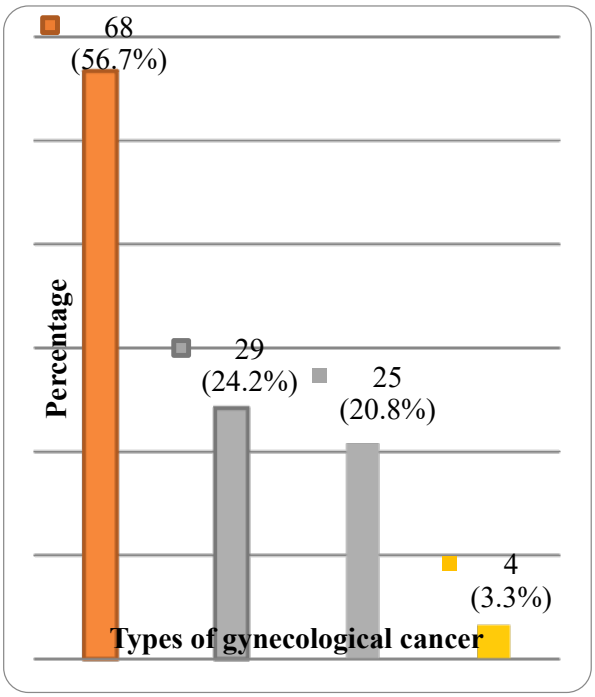

Figure 1: Distribution of the study population according to types of gynecological cancers(n=120)

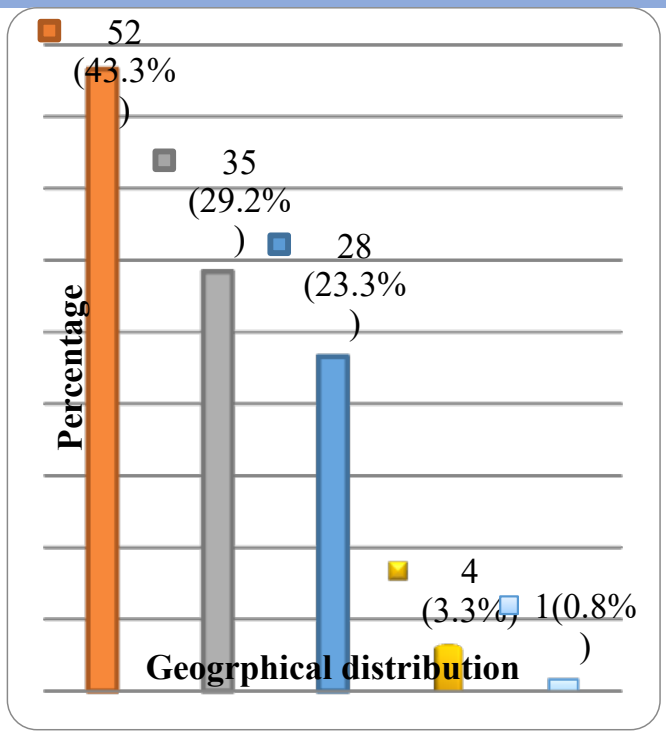

Figure 2: Geographical distribution of types of gynecological cancers among the study population (n=120)

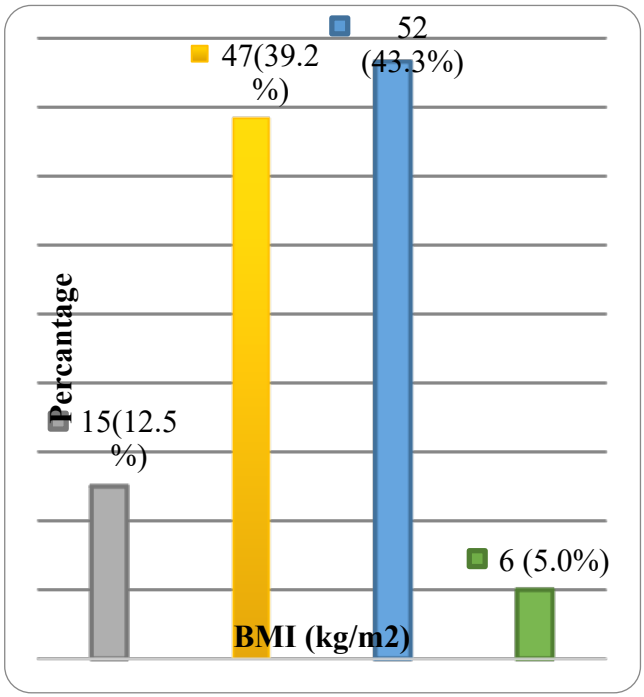

Figure 3: Distribution of the study Population according to BMI (n=120)

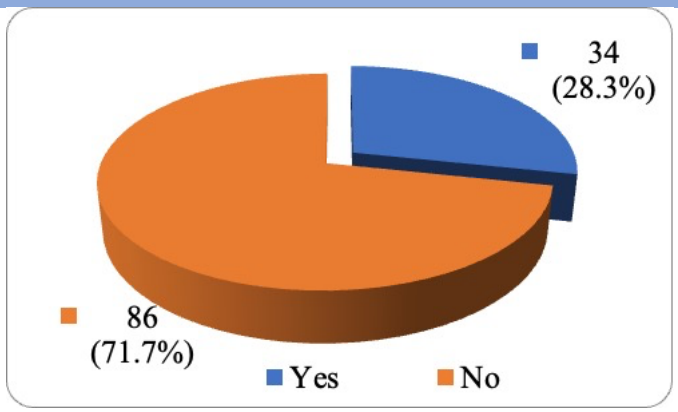

Figure 4: Distribution of the study population according to family history of similar cancer(n=120)

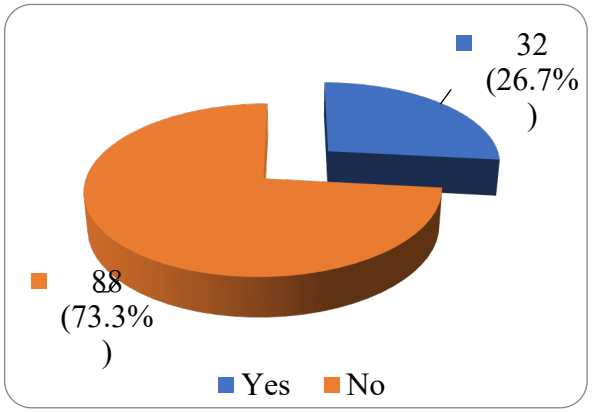

Figure 5: Distribution of the study population according to family history of other gynecological cancer (n=120)

Discussion

In this study, 120 women diagnosed with one of the gynecological cancers were included. The sample was taken as total coverage due to the infrequency of such cases. The study was conducted in three referral hospitals—Soba, Military, and Khartoum North Teaching Hospitals—which serve patients from all regions of Sudan. The majority of the study population were above 50 years of age (49.2%), consistent with previous literature reporting that gynecological cancers predominantly affect elderly women, as described by Shirley, Sinha, Brenner and Devesa [16]. Ovarian cancer was the most common type (56.7%), followed by uterine (24.2%), cervical (20.8%), and vulvar cancer (3.3%). This distribution supports the rarity of vulvar cancer and aligns with UK cancer statistics and findings from Amani, Elhassan, Ahmed and Osman in Sudan [17]. Geographically, these cancers were most frequently reported in central Sudan (43.3%), followed by western (29.2%), northern (23.3%), and other regions. Among women diagnosed with ovarian cancer, a family history of ovarian cancer was the major risk factor. A significant association was found between breast and ovarian cancer ($p = 0.001$), supporting the role of BRCA1 and BRCA2 mutations, as demonstrated in a Tunisian study by Riahi, Ben Ayed, Ghedira and colleagues [18]. Ovarian cancer frequently presented with nonspecific abdominal pain (82.4%), contributing to delayed diagnosis. A significant association was observed between all cancer types and a family history of gynecological or related cancers ($p = 0.004$), reinforcing the hereditary component described by Shirley, Sinha, Brenner and Devesa [16]. Uterine cancer was associated with elevated BMI (48.3%) and diabetes (72.4%). Obesity and diabetes increase estrogen levels through peripheral conversion in adipose tissue, consistent with findings by Zaki, El-Mazny,

Abdelaziz and El-Mazny in Egypt [19]. Additionally, 48.3% of women with endometrial cancer had polycystic ovary syndrome (PCOS), a recognized risk factor. Endometrial cancer typically presented with postmenopausal bleeding (79.3%), prompting earlier medical consultation and facilitating timely diagnosis and treatment. Most women in the study were married and had more than five children (44.7%). A strong association was found between high parity and cervical cancer ($p = 0.000$), but not with other cancer types. This may be due to cervical trauma during childbirth and prolonged sexual activity beginning at an early age, which increases the risk of HPV infection. These findings are supported by Benzabih, Tadesse, Abebe and Tsegaye in Ethiopia [20]. Cervical cancer often mimicked endometrial cancer, presenting with postmenopausal bleeding and discharge (76%). Most patients sought care within six months, indicating a trend of delayed consultation.

Vulvar cancer was rare (3.3%), consistent with its low global incidence. All affected patients presented with itching and ulceration. Due to the small number of cases, identifying specific risk factors was difficult. This aligns with findings from Tunisia by Kahila, Ben Dhiab, Zemni and colleagues [21], who also reported vulvar cancer as an uncommon malignancy, typically affecting older women who often present at advanced stages. This study identified distinct clinical and metabolic predictors for each gynecological cancer subtype, aligning with and expanding upon recent global evidence. Ovarian cancer was significantly associated with abdominal or pelvic pain (AOR: 4.92) and gastrointestinal symptoms (AOR: 3.15), consistent with its known presentation as a "silent killer" due to vague early symptoms. These findings align with those by Rooth, Johansson and Sundfeldt [22] and Gandotra, Choudhary and Patel [23], who emphasized that bloating, early satiety, and GI disturbances are common in late-stage diagnosis. A family history of ovarian cancer also emerged as a significant predictor (AOR: 2.35), echoing the observations of Ferrari, Giannini and Gadducci [24], who highlighted hereditary predisposition as a key risk factor.Endometrial cancer showed strong associations with postmenopausal bleeding (AOR: 6.02), elevated BMI (AOR: 4.22), diabetes (AOR: 3.88), and PCOS (AOR: 2.78). These results are in line with the metabolic and hormonal profiles described by Zannoni, Morosi and Scambia [25] and Nagel, Breugelmans and Leitao [26], who emphasized the role of unopposed estrogen and insulin resistance. The importance of BMI and metabolic syndrome is further supported by classification updates from Concin, Matias-Guiu and Vergote [27] and staging revisions by Berek, Mathews and Longacre [28]. Cervical cancer was significantly predicted by excessive vaginal discharge (AOR: 3.90), while postcoital bleeding and multiparity showed borderline associations. These results support the work of Kruczkowski, Nowak-Markwitz and Spaczynski [29] and Maheshwari, Singh and Kumar [30], who identified persistent HPV infection and high parity as major contributors to cervical neoplasia. The lack of significance for postcoital bleeding may reflect underreporting or late-stage presentation. Vulvar cancer, though rare, was strongly associated with skin color changes (AOR: 6.45) and age ≥ 60 years (AOR: 2.90). These findings are consistent with the observations of Günther, Alkatout and Hedderich [31] and Alkatout, Günther and Mundhenke [32], who reported that vulvar malignancies often present with visible dermatologic symptoms in older women. Wart-like lesions, although suggestive, did not reach statistical significance—likely due to the limited sample size.

Overall, these results emphasize the value of targeted, symptom-informed screening approaches. They align with calls for integrating molecular diagnostics with clinical predictors in early detection strategies, as emphasized by León-Castillo, Gilvazquez and McAlpine [33].

Strengths of this study include its multi-center recruitment from three referral hospitals, which enhances representativeness, and its comprehensive data collection covering demographic, clinical, familial, and

geographic variables. The inclusion of multiple gynecological cancer types allows for comparative analysis across subgroups. Use of statistical testing adds credibility to observed associations.
Limitations include the relatively small sample size, especially for less common cancers like vulvar cancer, which limits generalizability. Recall bias may affect self-reported family history and symptom duration. Cross-sectional design precludes causality inference. Lack of molecular or histopathological correlation may limit diagnostic specificity. Socioeconomic and access-related barriers may have influenced late presentations.

CONCLUSION

The study included all confirmed gynecological cancer cases during the study period across three Sudanese referral hospitals. Ovarian cancer was the most common, followed by uterine, cervical, and vulvar cancers, with central Sudan showing the highest regional prevalence. A family history of gynecological or breast cancer was a key risk factor for ovarian cancer, which often presented with nonspecific symptoms such as abdominal pain. Endometrial cancer was linked to obesity, diabetes, and PCOS, with postmenopausal bleeding as the predominant symptom. Cervical cancer was mainly associated with early marriage, high parity, and low socioeconomic status, often presenting with postmenopausal bleeding and vaginal discharge. Vulvar cancer was rare and typically presented with itching and ulceration; however, no specific risk factor was identified due to the small number of cases.

RECOMMENDATIONS

As gynecological cancer cases increase, particularly among women—the cornerstone of society—the burden on patients and their families is immense. It is essential to establish a qualified national registration system to monitor cancer frequencies and guide prevention strategies. Developing cost-effective screening programs targeting high-risk and sexually active women is crucial, alongside promoting national prompt cervical screening programs. Multidisciplinary centers staffed by gynecologic oncologists, senior gynecologists, general surgeons, well-equipped theaters, and accessible histopathology services must be prioritized. Specialized services ensure optimal care and follow-up. Structured protocols for diagnosis and referral should be implemented. Medical staff knowledge about red flag symptoms to enhance early diagnosis and detection of gynecological cancers must be enhanced through continuous education and workshops. Dedicated postmenopausal clinics should incorporate staff training in ultrasound and outpatient endometrial sampling. Widespread awareness campaigns are vital to educate women on early warning signs of gynecological cancers, promoting timely medical consultation and reducing morbidity and mortality.

Ethical clearance

The study received ethics approval from the Research and Ethics Committee of Soba, Omdurman Military Hospital and Khartoum North Teaching Hospitals. Also, from Sudan Medical Specialization Board.

Availability of data and materials

All data and materials are available when requested

Competing interest

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Authors contribution

All my authors contributed manuscript written.

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