Research Article

The frequency of epithelial ovarian cancer subtypes in Sudanese women at Omdurman Maternity Hospital, 2013-2018: A cross-sectional study

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Abstract

Background: Globally, epithelial ovarian carcinoma (EOC) is considered the gynecological cancer with the highest mortality. In Sudan, there are scarce publications about the frequency of this carcinoma. Therefore, the present study intended to perform a cross-sectional study to review the morphological sub-types and sort EOC according to age and grade in Omdurman Maternity Hospital (OMH) in Sudan.  
Methods: This cross-sectional, hospital-based study included 70 EOC cases diagnosed at OMH in the period 2013-2018. The data were collected from OMH records in the period 2016-2018, and included ovarian cancer types, ages of patients, and tumor grades.  
Results: The participants’ median age was 50 years, and the majority of EOC cases were in younger patients (48.6%; n=34; ≤ 50 years (18 to 50 years)). The most familiar tumor sub-type was serous carcinoma (44.3%; n=31), followed by endometrioid carcinoma (27.1%; n=19), mucinous carcinoma (17.1%; n=12), clear cell carcinoma (8.6%; n=6) and undifferentiated carcinoma (2.9%; n=2). The majority of cases were categorized as low grade (51.4%; n=36). Our results revealed significant relationships between EOC types and grades (Fisher’s Exact test, p=0.000).  
Conclusion: In Sudanese patients with EOC, serous carcinoma is the most common histological subtype, and EOC is likely to occur in women of a younger age (<50 years). Our results indicate a younger presentation of EOC and warrants quick and thorough investigation of any vague abdominal complaint in women of a younger age (<50 years). Also, it may help in guiding researchers developing screening programs especially for younger women, pay attention to the serous type as the common type and finding novel biomarkers especially for treatment and prognosis of this type.

Keywords

Epithelial Ovarian Cancer, Sudan, hospital-based, Omdurman Maternity Hospital

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Introduction

Ovarian carcinoma (OC) is the second most frequent gynecological cancer in developing countries and globally[1](https://f1000research.com/articles/8-1565/v1#ref-1),[2](https://f1000research.com/articles/8-1565/v1#ref-2). They are the fifth most mortal disease in women[3](https://f1000research.com/articles/8-1565/v1#ref-3),[4](https://f1000research.com/articles/8-1565/v1#ref-4), and in 2018, ~22,240 new events and 14,070 deaths were associated with OCs in the United States[5](https://f1000research.com/articles/8-1565/v1#ref-5),[6](https://f1000research.com/articles/8-1565/v1#ref-6). In Sudan, OCs ranked as the fourth highest malignancy in women, with an incidence rate of ~188 for every 100,000 people, which is 8 for every 100,000 people when gender is specified, and 7 for every 100,000 people with an age-standardized rate[7](https://f1000research.com/articles/8-1565/v1#ref-7),[8](https://f1000research.com/articles/8-1565/v1#ref-8).

~~Epithelial ovarian carcinoma~~ (EOC) is the most widespread and has the highest mortality of OC[1](https://f1000research.com/articles/8-1565/v1#ref-1),[9](https://f1000research.com/articles/8-1565/v1#ref-9), with high-grade serous ovarian cancer classed as the deadliest sub-type[10](https://f1000research.com/articles/8-1565/v1#ref-10),[11](https://f1000research.com/articles/8-1565/v1#ref-11). In the United State, generally, EOC has been considered an age-related disease; women aged >65 years are considered the target population[12](https://f1000research.com/articles/8-1565/v1#ref-12),[13](https://f1000research.com/articles/8-1565/v1#ref-13). Although the incidence of OCs is decreasing, in the majority of cases, distant metastasis is seen at diagnosis[14](https://f1000research.com/articles/8-1565/v1#ref-14),[15](https://f1000research.com/articles/8-1565/v1#ref-15). Surgery and chemotherapy are the most important treatments of this cancer but are efficient only in the early stages[16](https://f1000research.com/articles/8-1565/v1#ref-16),[17](https://f1000research.com/articles/8-1565/v1#ref-17). Currently; the prognosis for this cancer is still poor, and the five-year survival rate remains low[18](https://f1000research.com/articles/8-1565/v1#ref-18),[19](https://f1000research.com/articles/8-1565/v1#ref-19). In Sudan, scarce publications are available about the frequency and incidence of EOC. The present study intended to evaluate the morphological sub-types in Sudan using data from one hospital, sort the disease by age and grade and compare the results with similar studies in other regions of Sudan and other countries.

Methods

Study design

This was a cross-sectional, retrospective hospital-based study performed to determine the frequency of newly diagnosed EOC subtypes???, as well as to identify the relationship between subtypes and tumor grades and ages of patients.

The Ethics Committee of Alzaiem Alazhari University and Omdurman Maternity Hospital approved the study and waived informed consent from patients since there was anonymization of patients’ identity and only laboratory numbers were used.

Participants

A total of 70 EOC patients from Omdurman Maternity Hospital diagnosed in the period between 2013 and 2018 were selected for this study via convenience( or total coverage) sampling. The data were collected in the period between 2016 and 2018. All patients were adult women with OC and no other malignancies. Patients with tiny biopsies, missed blocks, or missing data (more than 50%) were excluded.

Data collection

Data were collected from hospital records, which included patients’ ages, EOC types, and tumor grades.

Statistical analysis

The statistical analysis of the collected data was performed using SPSS, version 24 (IBM SPSS). Descriptive analysis was performed for all study variables: EOC types, patient’s ages, and tumor grades. Fisher’s exact test was used for finding statistical significance between EOC types, patients’ ages, and tumor grades. A p-value of <0.05 was considered to be statistically significant.

Results

This study was conducted among 70 new EOC cases. The median age of participants was 50 years (range, 18 – 75 years). In total, 48.6% (n=34) of the participants were in the age group ≤ 50 years(18 to 50 years), and 44.3% (n=31) were in the age group > 50 years (51 to 75 years).The frequency of common histological subtypes is shown in [Figure 1](https://f1000research.com/articles/8-1565/v1#f1). The results showed that the majority of the cases were low grade (51.4%; n=36) compared with high grade (48.6%; n=34).

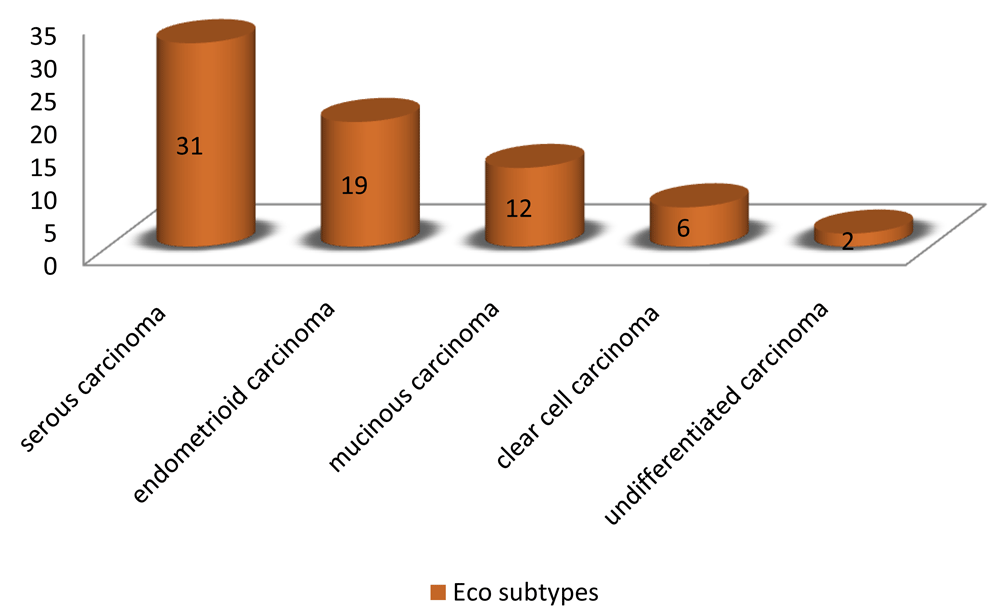
[](https://f1000researchdata.s3.amazonaws.com/manuscripts/21706/d00ec5a6-e5fb-4d0a-825b-a5fce215e7e9_figure1.gif)

Figure 1. Frequency of epithelial ovarian carcinoma histological sub-types among Sudanese women.(n,70)

Our results showed significant associations between EOC tumor types and EOC tumor grades (Fisher’s Exact test, p = 0.000) and no significant associations between tumor types and ages (Fisher’s Exact test, p>0.05).

Discussion

OCs are the most lethal gynecological malignancy worldwide and constitutes the fifth leading cause of cancer-related death in women[20](https://f1000research.com/articles/8-1565/v1#ref-20),[21](https://f1000research.com/articles/8-1565/v1#ref-21). Comparison of the age distribution of new OC cases revealed that the median age of 50 years recorded in this study is similar to a local study from Gezira State, Sudan[7](https://f1000research.com/articles/8-1565/v1#ref-7), sub-Saharan African[22](https://f1000research.com/articles/8-1565/v1#ref-22),[23](https://f1000research.com/articles/8-1565/v1#ref-23) and other developing countries[24](https://f1000research.com/articles/8-1565/v1#ref-24). Nevertheless, it is lower than that reported from developed countries[25](https://f1000research.com/articles/8-1565/v1#ref-25), for example a median age of 65 years was reported from the Netherlands[26](https://f1000research.com/articles/8-1565/v1#ref-26). The lower age in this study may suggest an earlier onset or a more aggressive course of the disease in our environment. Also, it may be because Africa has the youngest population of any of the continents[27](https://f1000research.com/articles/8-1565/v1#ref-27). Our study results indicate a younger presentation of EOC and warrants quick and thorough investigation of any vague abdominal complaint in women of a younger age group (<50 years). In the present study, serous adenocarcinoma is the most frequent histological type (43.1%), which is supported by previous studies[28](https://f1000research.com/articles/8-1565/v1#ref-28)–[30](https://f1000research.com/articles/8-1565/v1#ref-30).

Limitations of the study

This research was affected by the inherent limitations of the retrospective type of study. Also, it was reliant on the data extracted from medical records, was based at a single institution-based, and had a small sample size. Finally, there were missing variables for some participants; incomplete or missing documents may lead to the introduction of bias into the study and affect the outcome.

Conclusion

The present study revealed that contrary to some previously published data, EOC affected a larger proportion of younger Sudanese women. The most prevalent subtype of EOC is serous carcinoma. A further study of frequency and prevalence of EOCs in other parts of Sudan is needed.

Data availability

Underlying data

Figshare: frequency data.csv, <https://doi.org/10.6084/m9.figshare.9255200>[31](https://f1000research.com/articles/8-1565/v1#ref-31)

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](http://creativecommons.org/publicdomain/zero/1.0/) (CC0 1.0 Public domain dedication).

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