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**Original Research Article**

# Clinicopathological analysis of ovarian neoplasm

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## ABSTRACT

**Background:** Ovarian neoplasm is a type of cancer caused by uncontrolled growth and division of cells within the ovary. It is a common type of gynecological cancer that affects a wide range of ages and can have various clinical, morphological, and histological features. This study aimed to examine the relationship between clinical presentation and histological pattern of ovarian neoplasm.
**Methods:** This cross-sectional study conducted among 45 patients admitted to department of gynecology at Shaheed Suhrawardy medical college and hospital with features of ovarian neoplasm from February 2013 to February 2014.
**Results:** The 82.3% of cases were benign tumors, 15.5% were malignant tumors, and 2.2% were borderline tumors. Benign tumors were more common in the 3rd decade, while malignant tumors were more common in the 4th to 6th decade. Symptoms of benign tumors included abdominal lumps and pain, while malignant tumors presented with abdominal pain, GIT-related symptoms, and ascites in some cases. The most common type of tumor was surface epithelial (84.5%), followed by germ cell (13.3%) and sex cord-stromal (2.2%) tumors.
**Conclusions:** The study highlights the importance of recognizing the different clinical presentations of benign and malignant ovarian neoplasm.

**Keywords:** Ovarian neoplasm, Morphology, Histology, Malignancy

## INTRODUCTION

Ovarian tumors are common forms of neoplasia in women. These neoplasms have become increasingly important not only because of the large variety of neoplastic variants but more because they have gradually increased the mortality rate due to female genital cancers.[1] Ovarian neoplasms are common tumors in females encompassing 23% of all gynecologic tumors and are the most common gynecologic malignancy.[2] It is the 3rd commonest cause of death due to malignancies of the female genital tract in the western world.[3] Ovarian neoplasm is the most mysterious tumor in women concerning its histogenesis, clinical behavior, and malignant potentiality. Furthermore, no age group is immune to developing ovarian neoplasm and no age is exempted. Ovarian cancer incidence rates are 2 to 3 times higher in women between 65 to 84 years of age than in younger women.[4] A higher frequency of carcinoma is seen in unmarried women and married women with low parity.[5] The percentage of benign ovarian neoplasm changes with the age of the women, but most of them are functional and require very minimum resources or do not require anything for remedy. Geographic and racial differences in the incidence of cancer are well recognized, but information regarding any dissimilarity in clinicopathological behavior of cancers is scarce. There is considerable variability in the incidence of cancer and its related mortality amongst different racial groups. Blacks are more likely to develop cancer and have higher mortality than whites, Asian pacific islanders, American Indians, or Hispanics.[6,7] The geographical differences in cancer incidence, as well as mortality rates, are generally lower for Asian and African countries.[8] About 60 to 80 percent of ovarian tumors are of epithelial origin and the rest are from germ cells (15-20%) and sex cord.[9] The American joint committee on cancer endorses the histological typing of malignant ovarian tumors as endorsed by the world health organization and

recommends that all ovarian epithelial tumors be subdivided according to a simplified version as benign, borderline, and malignant in almost all varieties like serous, mucinous, endometroid, clear cell, Brenner, etc.[10] Among the neoplasms 75% are benign and the rest are borderline and malignant. 80% of malignant tumors are of primary origin and the rest is secondary named as Kruckenberg tumor.[9] Clinical diagnosis of early ovarian malignancy is infrequent since ovarian neoplasm does not produce any specific symptoms. Symptoms are often neglected both by patients and physicians as minor gynecological problems. At presentation, almost 2/3rd patients of with ovarian neoplasms are diagnosed at a late stage.[11] Greater than 90% of ovarian cancers arise from the surface epithelium and tumorogenesis has been associated with wound repair and inflammation, possibly leading to abnormal stem cell expansion. Over the last several years, it has been increasingly evident that a small population of cancer cells referred to as 'cancer stem cells is responsible for the aggressiveness of the disease, metastases, and resistance to therapy.[12] Several genetic and epigenetic changes lead to ovarian carcinoma.[13] Women with the polycystic ovarian syndrome were found to have a 2.5-fold increased risk of developing an epithelial ovarian tumor. Moreover, unopposed estrogen therapy may be associated with a significant increase in the risk of endometroid, and epithelial ovarian tumors.[14] The symptoms of ovarian tumors are nonspecific. These include a feeling of abdominal distension and vague discomfort, features of dyspepsia, and dull aching pain. Ovarian tumor placed in ureterovesical pouch anterior to the uterus and these impacted in the pouch of Douglas may cause the frequency of micturition and even retention pressure on rectum is hardly ever noticed.[15] Malignant tumors may cause pallor/ varying degrees of cachexia. Ascites may develop due to obstruction of peritoneal fluid outflow.[16] The aim of study was to assess relationship between clinical presentation and histopathological patterns of ovarian neoplasm.

### *Objectives*

*General objective*

General objectives were to find out relation between various morphological features of ovarian tumors and their pattern of occurrence concerning age and mode of presentation

*Specific objective*

Specific objectives were to assess the clinical presentation of cases of ovarian tumors and to determine the histopathological findings of these cases

## METHODS

This cross-sectional study was conducted at the department of obstetrics and gynecology at Shaheed Suhrawardy medical college hospital, Bangladesh. The study period was from February 2013 to February 2014. The sample consisted of 45 patients who presented with an ovarian tumor and had evidence of ovarian neoplasm radiologically (USG or CT scan). Patients were selected for the study if they had a persistent adnexal mass clinically and/or radiologically, and had given consent to participate. Patients with ovarian neoplasm who were not willing to undergo an operative procedure or were not fit for surgery were excluded. Data was collected by interview, physical and laboratory examination using a structured questionnaire containing all relevant variables. Information on pathology was obtained from a histopathological report. The collected data was recorded on a predesigned data collection sheet and analyzed using SPSS (Statistical package for social sciences) version 16.0 for Windows. The research protocol was approved by the ethical committee of Shaheed Suhrawardy medical college and hospital, and all information was kept confidential.

## RESULTS

A total of 45 cases were studied. Among them 37(82.3%) were benign, 7(15.50%) were malignant and 1(2.2%) case were of borderline was Brenner. Of 45 cases of ovarian tumor 38(84.5%) cases had surface epithelial tumors, 6 (13.3%) cases were germ cell tumors and 1 (2.20%) case was of sex cord-stromal tumor (Table 1). The age group varied from 17 to 70 years. This study revealed that the frequency of ovarian tumors is more in between 21 to 50 years. Benign tumors were more common in the 3rd and 4th decades whereas malignant tumors were in the 4th to 6th decades. Most serous cystadenoma and mucinous cystadenoma were presented between 21 to 40 years. Germ cell tumors were found at a young age and sex cord-stromal tumors were found at more than 61 years. Serous cystadenoma and mucinous cystadenoma were found in 41 to 61 years and more than 61 years respectively (Table 2). Benign neoplasm of the ovary presented with abdominal pain in 78.38% of cases and with a lump in 54.05% of cases. Among the benign neoplasm, a menstrual disturbance was observed in most endometrioid tumors 8.11%, sex cord-stromal tumor (1 out of 1), and abdominal discomfort in mucinous cystadenoma and endometroid tumors (10.81). Only one borderline tumor presented with pain, lump, and discomfort. The malignant tumor presented with abdominal pain in 100% of cases, lump in 85.72% of cases, and GIT-related symptoms in 71.43% of cases. Among the malignant cases, menstrual disturbance showed in mucinous cystadenocarcinoma and non-gestational choriocarcinoma, and abdominal discomfort in mucinous cystadenocarcinoma (Table 3). Most of the benign tumors (67.56%) were cystic, the rest 27.03%, and 5.42% of cases were partly cystic and partly solid respectively. Among benign tumors, two of the mature teratomas were solid. About 42.86% of malignant tumors were solid, 42.86% were partly cystic partly solid and only 14.28% cases were cystic. Among the malignant tumors, serous cystadenocarcinoma was solid in 3 out of 4 cases and the rest of the malignant tumors of different histology were partly cystic and partly solid. Borderline Brenner tumor was solid in morphology (Table 4).

**Table 1: Types of ovarian tumor, (n=45).**

| Histopathological types of tumors | Classification of tumors, n (%) | | | Number of cases | Percentage of total cases (%) |
|---|---|---|---|---|---|
| | Benign 37 (82.30) | Borderline 1 (2.20) | Malignant 7 (15.50) | | |
| **Epithelial tumors** | | | | 38 | 84.50 |
| Serous cystadenoma | 19 | - | - | 19 | 42.50 |
| Serous cystadenocarcinoma | - | - | 4 | 4 | 8.90 |
| Mucinous cystadenoma | 9 | - | - | 9 | 20 |
| Mucinous cystadenocarcinoma | - | - | 2 | 2 | 4.40 |
| Endometroid | 3 | - | - | 3 | 6.60 |
| Brenners | - | 1 | - | 1 | 2.20 |
| **Germ cell tumor** | | | | 6 | 13.30 |
| Mature teratoma | 5 | - | - | 5 | 11.20 |
| Non gestational choriocarcinoma | - | - | 1 | 1 | 2.20 |
| **Sex cord-stromal tumor** | | | | 1 | 2.20 |
| Fibroma | 1 | - | - | 1 | 2.20 |

**Table 2: Age distribution of ovarian tumor, (n=45).**

| Histopathological types | Age distribution (Years), n (%) | | | | | |
|---|---|---|---|---|---|---|
| | <20 | 21-30 | 31-40 | 41-50 | 51-60 | >60 |
| **Benign tumors, (n=37)** | 1 (2.7) | 14 (37.43) | 12 (32.43) | 4 (10.81) | 2 (5.41) | 4 (10.81) |
| Serous cystadenoma | - | 8 (21.62) | 06 (16.22) | 2 (5.41) | 1 (2.70) | 2 (5.41) |
| Mucinous cystadenoma | - | 3 (8.11) | 04 (10.81) | 1 (2.70) | - | 1 (2.70) |
| Endometroid | - | 1 (2.70) | - | 1 (2.70) | 1 (2.70) | - |
| Teratoma | 1 (2.70) | 2 (5.41) | 02 (5.41) | - | - | - |
| Sex cord-stromal | - | - | - | - | - | 1 (2.70) |
| **Borderline tumor, (n=1)** | - | - | - | 1 (100) | - | - |
| Brenners tumor | - | - | - | 1 (100) | - | - |
| **Malignant tumors, (n=7)** | - | - | - | 3 (42.86) | 2 (28.57) | 2 (28.57) |
| Serous cystadenocarcinoma | - | - | - | 2 (28.57) | 2 (28.57) | - |
| Mucinous cystadenoma | - | - | - | - | - | 2 (28.57) |
| Non gestational choriocarcinoma | - | - | - | 1 (14.29) | - | - |

**Table 3: Clinical features of ovarian tumors according to histopathological types, (n=45).**

| Type of tumors | Clinical presentation, n (%) | | | | | |
|---|---|---|---|---|---|---|
| | Abdominal pain | Abdominal lump | GIT symptoms | Menstrual disturbance | Ascites | Abdominal discomfort |
| **Benign, (n=37)** | 29 (78.38) | 20 (54.05) | 2 (5.40) | 6 (16.22) | - | 4 (10.81) |
| Serous cystadenoma | 15 (40.54) | 10 (27.02) | - | 1 (2.70) | - | - |
| Mucinous cystadenoma | 8 (21.61) | 6 (16.21) | - | 1 (2.70) | - | 2 (5.41) |
| Endometroid | 3 (8.11) | 2 (5.41) | 1 (2.70) | 3 (8.11) | - | 2 (5.41) |
| Mature teratoma | 2 (5.41) | 2 (5.41) | - | - | - | - |
| Sex cord-stromal | - | 1 (2.70) | 1 (2.70) | 1 (2.70) | - | - |
| **Borderline, (n=1)** | 1 (100) | 1 (100) | - | - | - | 1 (100) |
| Brenners tumor | 1 (100) | 1 (100) | - | - | - | 1 (100) |
| **Malignant, (n=7)** | 7 (100) | 6 (85.72) | 5 (71.43) | 3 (42.86) | 2 (28.57) | 1 (14.28) |
| Serous cystadenocarcinoma | 4 (57.14) | 3 (42.86) | 3 (42.86) | - | 2 (28.57) | - |
| Mucinous cystadenocarcinoma | 2 (28.57) | 2 (928.57) | 2 (28.57) | 2 (28.57) | - | 2 (28.57) |
| Non gestational choriocarcinoma | 1 (14.29) | 1 (14.29) | - | 1 (14.29) | - | - |

**Table 4: The gross appearance of ovarian tumors according to histopathological type, (n=45).**

| Histopathological types of tumors | Gross appearance of ovarian tumors, n (%) | | |
|---|---|---|---|
| | Cystic | Solid | Partly cystic and partly solid |
| **Benign, (n=37)** | 25 (67.56) | 2 (5.41) | 10 (27.03) |
| Serous cystadenoma | 17 (45.95) | - | 2 (5.41) |
| Mucinous cystadenoma | 7 (18.92) | - | - |
| Endometroid | - | - | 3 (8.11) |
| Mature teratoma | 1 (2.70) | 2 (5.41) | 2 (5.41) |
| Sex cord-stromal | - | - | 1 (2.70) |
| **Borderline, (n=1)** | - | 1 (100) | - |
| Brenners tumor | - | 1 (100) | - |
| **Malignant, (n=7)** | 1 (14.28) | 3 (42.86) | 3 (42.86) |
| Serous cystadenocarcinoma | 1 (14.28) | 3 (42.86) | - |
| Mucinous cystadenocarcinoma | - | - | 2 (28.57) |
| Non gestational choriocarcinoma | - | - | 1 (14.28) |

## DISCUSSION

A total of 45 cases were studied. Among them 37 (82.3%) were benign, 7 (15.50%) were malignant and 1 (2.2%) case was borderline named Brenner. Another study showed that 75.2% of tumors were benign, 20.94% were malignant and 2.8% were borderline malignancy which was quite understandable.[17] Histo-pathologically, a total of 45 patients who presented with ovarian tumors were classified according to WHO classification. Surface epithelial tumors were the commonest variety, constituting 84.50% of the ovarian tumor followed by germ cell tumors 13.30% and sex cord-stromal tumors 2.20%. The surface epithelial tumors are the most common ovarian tumor. Benign epithelial tumors are more frequent than malignant ones and occur during the reproductive age group. Serous epithelial tumors are the most common ovarian tumor. In this study, serous cystadenoma was the single most common tumor which constituted 42.50% of cases. It was found in 32.20% in another quite relatable study. Mucinous tumors are not infrequent and can grow to a large size. In this study, mucinous cystadenoma was the single most common tumor which established 20% of total cases. The most common malignant ovarian tumor was serous cystadenoma which constituted about 8.90% in the present study. serous cystadenoma was also the most common malignant ovarian tumor in a study that established 10.28% cases of all cases. Sex cord-stromal tumors are usually seen in the postmenopausal age group. In this study, 1 benign sex cord-stromal tumor was found which accounted for 2.20% of total cases and also relatable with another study (3.5%). In germ cell tumors, teratoma is common. In this study, they were 3$^{rd}$ most common tumors which constituted 13.30% of cases. In a study, they constituted 15.6% which is similar to this study.[17] The ovarian tumors manifest with a wide variety of clinical manifestations. Abdominal pain with a lump is usual complaint. Few tumors cause menstrual irregularity. Most of the malignant tumors show GIT symptoms and abdominal discomfort. Another study also showed similar symptoms.[18] In this study, 78.38 % of benign and all malignant tumors presented with abdominal pain whereas about 54.05% of benign and 85.71% of malignant cases presented with an abdominal lump. In a study, 70% of the patient presented with abdominal pain, and 63% have abdominal lumps.[17] Some patients (20%) in this study had been associated with menstrual disorders which comprised 42.86% of malignant and 16.22% of benign cases. Among the benign neoplasm, the menstrual disturbance was observed in most endometroid tumors (3 out of 3 cases), sex cord-stromal tumors (1 out of 1 case) and in the malignant cases, menstrual disturbance showed in mucinous cyst adenocarcinoma and non-gestational choriocarcinoma. In another study, 40.2% of cases had menstrual abnormality which was high compared to the present study.[17] Ovarian tumors vary from cystic to solid in consistency. Most of the benign ovarian tumors are cystic (67.56%) and only 5.41% were solid which was quite relatable to another study.[19] Among benign tumors, serous cyst adenoma and mucinous cyst adenoma showed cystic and two cases of mature teratomas were solid. About 42.86% of malignant tumors were solid, 42.86% were partly cystic partly solid and only 14.28% were solid. Three out of four serous cyst adenocarcinoma were solid and the rest of the malignant tumors of different histology were partly cystic and partly solid. Borderline Brenner tumor showed solid morphology. In a study, 76% of benign were cystic, 21.5% were partly solid partly cystic and 2.4 % were solid. In malignant category, 49.20% were solid and 44.1% partly cystic and partly solid which reveals same picture as this study.[17] Another study also showed that solid ovarian tumors are malignant in 80% of cases.[20]

### *Limitations*

Study was conducted in a single hospital with small sample size. So, results may not represent whole community.

## CONCLUSION

In the present study, clinicopathological analysis of various patterns of ovarian tumors was studied for one year from February, 13 to February,14. A total of 45 cases were studied in which benign tumors were the most common

followed by malignancy and a few cases of borderline tumors. The tumors were classified according to the WHO classification of ovarian tumors which showed surface epithelial tumors were the commonest variety. This study revealed that the frequency of ovarian tumors is more in between 21-50 years. Benign tumors were more common in the 3rd and 4th decades whereas malignant cases were in the 4th to 6th decades. Abdominal pain & lump are the commonest symptoms in cases of ovarian tumors which are more prominent in malignant & borderline malignant tumors than benign, followed by GIT symptoms in malignant tumors, menstrual irregularity in functional ovarian tumors, and ascites in malignant tumors. This study also showed that most of the benign tumors were cystic and the malignant tumors were solid.

***Recommendation***

Due to anatomical position of ovaries and gradual progression of the disease usually, ovarian neoplasm presents in the advanced stage and ovarian malignancy consists 15-20% of female genital tract cancer but has no screening system. So, early detection by progressing analysis from presenting features produced by different varieties of ovarian neoplasms and there by early precision could be made by gynecologists about extent of surgery.

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