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A retrospective observational study on ovarian tumors and analysis of demographic factors and histopathological findings in a tertiary care center, Theni, Tamil Nadu

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ABSTRACT

Background: Ovarian cancer is a significant global health concern, ranking 5th among cancer deaths among women and causing more deaths than any other cancer of the female reproductive system. It is the second most common gynecological cancer in India, with a high disease-related mortality rate owing to its asymptomatic nature in the early stages. **Aims and Objectives:** This retrospective hospital-based observational study aimed to identify the demographic features of women with ovarian tumors detected by ultrasonography and their correlation with histopathology. **Materials and Methods:** This retrospective hospital-based observational study included 139 women who underwent surgery for ovarian tumors at a tertiary care center in South India between September 2022 and August 2023. Patient details were collected from the gynecological outpatient department, surgical procedures, and final histopathological reports. Descriptive analysis was performed using frequencies and proportions for categorical variables, and the Chi-square test was used to test the statistical significance of the cross-tabulation between categorical variables. **Results:** Most ovarian tumors were found in multiparous women aged 41–60 years 69 patients, (49.6%), and most were unilateral or cystic. Benign serous cystadenoma was the most common tumor type (n = 51, 36.7%), whereas serous cystadenocarcinoma was the most common malignant tumor (n = 10, 7.2%). There were statistically significant differences in age group, size, consistency, and laterality according to histopathological examination ($P < 0.05$). **Conclusion:** This study provides valuable information on the demographic factors and histopathological findings of ovarian tumors in a tertiary care center in South India.

Key words: Ovarian tumors; Demographic features; Histopathology; Ultrasound; Gynecological cancer

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INTRODUCTION

Ovarian tumors are a major global health concern. Ovarian malignancy is the 2nd most common cancer in women of reproductive age. It is the leading cause of death in patients with gynecological malignancies. The Indian cancer registry data project the ovary as an important site of cancer in females, comprising about 8.7% of cancer in different parts of the country.[1] Ovaries undergo various changes throughout an individual's life under the influence of different hormones. This could lead to different types of diseases, benign or malignant.[2] Ovarian cancer has the worst prognosis among gynecological malignancies due to lack of proper signs, symptoms, and presentation often detected at later stages.[3] Majority of them present at late stages with poor survival rates making histopathologic study and staging after surgery the definitive diagnostic modality to date.[4]

According to the World Ovarian Cancer Coalition Atlas 2018, India has the 2nd highest incidence of ovarian cancer

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worldwide.[2] The frequency and histological features of ovarian tumors are influenced by various demographic factors. To effectively diagnose, treat, and manage patients, it is essential to understand these elements.

Aims and objectives

This study aimed to identify the demographic features of women with ovarian tumors detected using ultrasound and their correlation with histopathology.

MATERIALS AND METHODS

This retrospective hospital-based observational study included 139 women who underwent surgical procedures for ovarian tumors in the Department of Obstetrics and Gynecology at Government Theni Medical College between September 2022 and August 2023. Patient details were collected from the gynecology outpatient department, and surgical procedures and final histopathology reports were obtained from registers maintained in the Department of Obstetrics and Gynecology at a tertiary care center in South India**.** Informed consent and ethical clearance were obtained from the institutional ethics committee (approval no 1515/ME III/21-4) dated October 5, 2023.

Inclusion criteria

Women who underwent surgery for ovarian tumors were included in this study.

Exclusion criteria

Women diagnosed with other abdominal masses (fibroids or adenomyosis) were excluded from the study.

A retrospective examination of the medical data of patients diagnosed with ovarian tumors during the data collection period was part of the study. Age, parity, and relevant clinical history were collected from clinical demographic data. The tumor type, grade, and stage were histopathological findings. The data obtained included information about the type of tumor and other details. The data were entered into an Excel spreadsheet and further analysis was performed.

Statistical analysis

Descriptive analyses were performed using frequencies and proportions for the categorical variables. Continuous variables are presented as medians interquartile range. The Chi-square test was used to test the statistical significance of the cross-tabulation between categorical variables. Statistical significance was set at $P<0.05$.

RESULTS

A total of 139 patients with ovarian tumors had a mean age of 39.88 years (±13.47). The most affected age group was 41–60 accounting for 69 patients (49.6%), followed by 49 (35.3%) in 21–40 years, 13 (9.4%) aged <20 years, and 8 (5.8%) aged ≥61 years. Among parity, 17.3% were primiparous and 75.5% were multiparous.

Considering tumor size, tumors ranged from the smallest 3 cm to the largest 25 cm; only 14 (10.1%) were <5 cm, 83 (60.1%) were 5–9.9 cm, 38 (27.5%) were 10–20 cm, and 3 patients (2.2%) were >20 cm. In terms of laterality, the majority of 127 patients (91.4%) had unilateral tumors, whereas 12 patients (8.6%) had bilateral tumors. Of the unilateral tumors, 72 (51.8%) were more frequently involved on the right side than on the left side in 55 patients (39.6%).

Of the 139 patients, the majority (123 patients, 88.5%) were cystic in consistency, followed by solid 12 (8.6%) and mixed 4 (2.9%). Considering the presentation of ovarian tumors, most of them presented with abdominal pain in 70 (50.4%), followed by abdominal mass in 29 (20.9%), AUB in 16 (11.5%), and incidental findings in 6 (4.3%). Staging laparotomy was the most common surgical procedure used for the resection of the ovarian tumor in 70 patients (50.4%). Most tumors were benign (n=127, 91.4%), borderline (n=2, 1.4%), or malignant (n=10, 7.2%) (Tables 1 and 2).

Surface epithelial tumors accounted for 94 patients (67.6%), germ cell tumors for 9 (6.5%), and sex cord-stromal tumors for 8 (5.8%). The most common tumor type was benign serous cystadenoma (n=51, 36.7%). The most common malignant tumor was serous cystadenocarcinoma (n=10, 7.2%).

Tumors associated with endometriosis were observed in one patient (0.7%). There were statistically significant differences in age, size, and laterality according to histopathological examination (HPE). Malignant tumors (80%) were present in the patient's age group 40–60. Of these, 77.78% were in size of 10–20 cm, 100% were solid, and 60% were bilateral. There were statistically significant differences in age group, size, consistency, and laterality according to HPE ($P<0.05$) (Table 3).

DISCUSSION

Ovarian neoplasms are usually present at a later stage. Due to monthly insults to the ovary during ovulatory cycles, the ovaries become susceptible to tumorigenesis.[5] In our study, of 139 patients, the mean age at which all ovarian tumors were present was 39.88 years, and the majority 49.6% of ovarian tumors arose in the age group of 41–60 years. This is in concordance with a study conducted in Andhra Pradesh by Shaik et al.,[2] and Karnataka by

Table 1: Demographic data of the study population (n=139)

Parameters	Frequency	Percentages
Age		
≤20	13	9.40
21–40	49	35.30
41–60	69	49.60
≥61	8	5.80
Parity		
Primiparous	24	17.30
Multiparous	105	75.50
NA	10	7.20
Size (n=138)		
<5	14	10.10
5–9.9	83	60.10
10–20	38	27.50
>20	3	2.20
Laterality		
Right	72	51.80
Left	55	39.60
Bilateral	12	8.60
Consistency		
Solid	12	8.60
Cystic	123	88.50
Mixed	4	2.90
Diagnosis		
Pain abdomen	70	50.40
Mass abdomen	29	20.90
Acute pain abdomen	18	12.90
AUB	16	11.50
Incidental findings	6	4.30
Procedure		
Tah with BSO	18	12.90
Staging laparotomy	70	50.40
Laparotomy proceeds to ovarian cystectomy	47	33.80
Laparotomy proceeded to para-ovarian cystectomy	3	2.10
Laparoscopic ovarian cystectomy	1	0.70
Histopathological examination		
Benign	127	91.40
Borderline	2	1.40
Malignant	10	7.20

Clement and Young where the majority of tumors were in the age group 41–60 years.[6]

In our study, 105 (75.5%) patients were multiparous. This is in concordance with the study conducted by Ibrahimkhil et al., in Afghanistan, where almost half of the participants were multiparous (57.1%), and in Nepal, 38.9% were multiparous.[7,8] In our study, considering tumor size, tumors ranged from the smallest 3 cm to the largest 25 cm, and the majority 83 (60.1%) were 5–9.9 cm. This is similar to a study performed by Gupta et al., in Uttar Pradesh, where the maximum number (41.8%) of patients were in the size range of 5–10 cm.[9]

In our study, considering laterality, the majority of the 127 patients (91.4%) had unilateral tumors. Of these, 72 patients on the right side (51.8%) had more involvement than those on the left side which is in concordance with the studies performed by Abena et al., in southern Ethiopia, where the majority (77%) were unilateral tumors and 10.2% (bilateral). In unilateral tumors, the right side was more frequently involved (43.3%) than the left side 33.7%.[4] Ibrahimkhil et al., unilateral (75.7%) tumors were more common than bilateral (7.3%), and right ovarian involvement (42.4%) was more common than the left (33.3%).[7] In Gupta et al., 186 (87.7%) patients were unilateral and 26 (12.3%) were bilateral.[9]

Of the 139 patients in our study, 123 (88.5%) were cystic and 12 (8.6%) were solid. This is similar to the studies conducted in Jaipur by Kaur et al., where (53.3%) were cystic and (6.3%) were solid. Furthermore, in Uttar Pradesh, the majority of ovarian tumors were cystic (56%), followed by mixed solid-cystic (32.1%) and the least common was solid (11.9%).[1,9]

Table 2: Descriptive analysis of HPE in the study population (n=139)

Histopathological examination	Types	Frequency	Percentages
Benign (n=127)	Benign serous cystadenoma ovary	51	36.70
	Benign mucinous cystadenoma ovary	24	17.20
	Seromucous cystadenoma of right ovary	3	2.20
	Torsion	19	13.70
	Cystic teratoma	9	6.50
	Right ovary – benign Brenner tumor	1	0.70
	Ovarian fibroma	3	2.20
	Hemorrhagic cyst	7	5.00
	Serous papillary cyst adenofibroma ovary	3	2.20
	Simple benign right Para tubal cyst	1	0.70
	Benign papillary serous cyst adenofibroma of left ovary	1	0.70
	Granulosa cell right ovary cyst	3	2.20
	Right ovarian endometriosis other ovary hemorrhagic cyst	1	0.70
	Fibrothecoma	1	0.70
Borderline (n=2)	Left mucinous borderline tumor	1	0.70
	Benign mucinous borderline cyst of right ovary	1	0.70
Malignant (n=10)	Serous cystadenocarcinoma	9	6.50
	Mucinous cystadenocarcinoma	1	0.70

Table 3: Comparison of demographic features according to HPE (n=139)

HPE	Benign (n=127) (%)	Borderline (n=2) (%)	Malignant (n=10) (%)	P-value
Age groups				
≤20	13 (10.24)	0 (0)	0 (0)	0.045
21–40	49 (38.58)	0 (0)	0 (0)	
41–60	59 (46.46)	2 (100)	8 (80)	
≥61	6 (4.72)	0 (0)	2 (20)	
Size category				
<5	13 (10.24)	0 (0)	1 (11.11)	0.033
5–9.9	81 (63.78)	1 (50)	1 (11.11)	
10–20	30 (23.62)	1 (50)	7 (77.78)	
>20	3 (2.36)	0 (0)	0 (0)	
Consistency				
Solid	2 (1.57)	0 (0)	10 (100)	<0.001
Cystic	123 (96.85)	0 (0)	0 (0)	
Mixed	2 (1.57)	2 (100)	0 (0)	
Laterality				
Right	69 (54.33)	1 (50)	2 (20)	<0.001
Left	52 (40.94)	1 (50)	2 (20)	
Bilateral	6 (4.72)	0 (0)	6 (60)	

In our study, considering the presentation of ovarian tumors, most patients presented with pain in the abdomen 70 (50.4%). This is similar to the study performed by Mehra et al., in Patna, pain in the abdomen and mass per abdomen are the most common clinical presentations for ovarian neoplasms.[10] It is also in concordance with the study by Pilli et al.,[11] and by Thakkar and Shah.[12]

In our study, considering the surgical procedures, staging laparotomy was the most common procedure used for the resection of ovarian tumors (n=70, 50.4%), whereas Mehra et al., in Patna, included total abdominal hysterectomy and bilateral salpingo-oophorectomy.[10]

In our study, most tumors were benign 127 (91.4%), of which surface epithelial tumors accounted for 94 patients (67.6%), germ cell tumors for 9 (6.5%), and sex cord-stromal tumors for 8 (5.8%). This is similar to studies performed by Mehra et al., where surface epithelial tumors were seen in the majority of the patients, accounting for 69%.[10] In Ibrahimkhil et al.,[7] surface epithelial tumors accounted for 52%, and germ cell tumors accounted for 39.9%. Similar results were observed in studies by Batool et al.,[3] Gupta et al.,[9] and Mankar and Jain.[13]

In our study, the most common tumor type was benign serous cystadenoma (n=51, 36.7%), which coincides with studies by Maheshwari et al.,[14] Ramachandra et al.,[15] Swamy and Satyanarayana.[16]

In our study, the most common malignant tumor was serous cystadenocarcinoma which is similar to studies by Shaik et al.,[2] Gupta et al.,[9] Mankar and Jain.[13]

In our study, 80% of malignant tumors were presented in the age group of 40–60 which is in concordance with studies by Jha and Karki,[17] and Kayastha.[8]

Among the malignant tumors in our study, 77.78% were in size 10–20 cm, 100% were solid, and 60% were bilateral. There were statistically significant differences in age, size, and laterality according to HPE.

Limitations of the study

Generally, nulliparous women have a higher incidence of ovarian malignancy, but in our study, multiparous women were more affected.

CONCLUSION

The study found that ovarian tumors were more frequent in women aged 41–60 and in multiparous women. Most tumors were benign, unilateral, and more commonly located on the right side. Consistent with findings from other studies, malignant tumors were more prevalent in older women, often presenting as bilateral, larger, and solid masses. Significant differences were observed in age, tumor size, consistency, and laterality. Serous cystadenoma was identified as the most common benign tumor, while serous cystadenocarcinoma was the most common malignant tumor. Abdominal pain was the most frequently reported symptom. These findings highlight the importance of thorough evaluation and personalized treatment strategies for patients with ovarian tumors.

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