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A retrospective study of clinico-pathologic patterns, in women below 40 years, with ovarian cancer

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Abstract: Objectives and methods: The present study is a Prospective study of clinico-pathologic patterns, in women 40 years and below, with ovarian cancer undertaken in Srinivasan Medical College Hospital and Research Centre over a period of 36 months.
Inclusion Criteria: Patients $\leq$ 40 years with histologically proven ovarian cancer and Primary ovarian cancers **Exclusion Criteria:** Patients above age 40 years, Those who did not have cancer ovary on final histopathology, Patients who were treated with chemotherapy only and not operated. 115 patients were retrospectively enlisted for our study out of which 93 could fulfil our inclusion criteria.
Results and conclusion: Even in women 40 years and less, 70% of the ovarian tumors were epithelial in histological type. Serous ovarian cancer was the most common. Germ cell tumor constituted 20% of the ovarian cancers. Mixed malignant germ cell tumor was the commonest type. The mean overall survival was 5.4 years. The overall survival was 87%. For epithelial tumors it was 82% and for non-epithelial tumors it was 96%. For early stage disease it was 100% but for advanced stages it was 73%.

Keywords: Ovarian cancer; Ovarian malignancy; Ovarian tumors; Clinico pathology.

1. Introduction

Cancer of the ovary is a highly lethal gynecological malignancy, ranking as the seventh leading cause of death among women worldwide. In India, it holds the position of being the third most prevalent cancer affecting women, following breast and cervical cancer. While existing literature often combines clinical characteristics and treatment approaches for both epithelial and non-epithelial ovarian tumors, there is a need for separate investigations. Furthermore, the frequency of epithelial tumors among young women and the extent to which the bimodal age distribution distinguishes between epithelial and non-epithelial tumors remain uncertain. Therefore, the primary objective of this study is to assess the clinico-pathological features and survival outcomes of women aged 40 years and younger who have been diagnosed with ovarian cancer and treated at a tertiary care hospital in India [1–10].

The specific aims and objectives of this study are as follows:

1. To investigate the clinico-pathologic patterns in women aged 40 years and below who have been diagnosed with ovarian cancer. This analysis will provide insights into the various clinical presentations and pathological characteristics exhibited by this specific patient population.
2. To compare the survival outcomes between epithelial and non-epithelial ovarian cancers in young women. By evaluating the differences in survival rates and prognosis, we can gain a better understanding of the disease progression and response to treatment among these distinct tumor types.

By addressing these aims and objectives, this study aims to contribute valuable knowledge regarding the clinical manifestations, pathological features, and survival outcomes of young women with ovarian cancer. Such insights will aid in tailoring treatment strategies and improving the overall management of this devastating disease.

2. Methodology

2.1. Study Design

This study employed a hybrid design combining elements of both retrospective and prospective approaches. Survival analysis was conducted to examine the primary outcomes, while a cohort design was utilized to assess the risk factors associated with ovarian cancer.

2.2. Inclusion Criteria

Patients meeting all of the following criteria were included in the study:

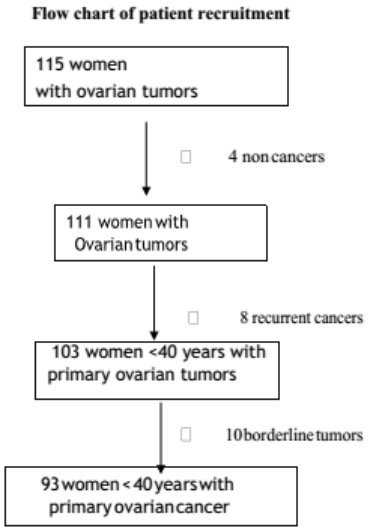
1. Patients aged $\leq$ 40 years with histologically confirmed ovarian cancer.
2. Patients who underwent surgery between January 2019 and December 2022.
3. Patients with primary ovarian cancers.

2.3. Exclusion Criteria

Patients meeting any of the following criteria were excluded from the study:

1. Patients aged above 40 years.
2. Patients without histopathological confirmation of ovarian cancer.
3. Patients who received chemotherapy without undergoing surgery.
4. Patients who had undergone surgery at a different healthcare facility.
5. Patients with ovarian tumors originating from cancers in other organs.

A total of 115 patients were retrospectively enrolled for the study, of which 93 fulfilled the inclusion criteria.



3. Results

In our study involving 111 patients with ovarian tumors, the majority (71.1%) had epithelial tumors, which were further classified as follows: serous (31 cases), mucinous (23 cases), endometrioid (11 cases), clear cell (2 cases), and adenocarcinoma not otherwise specified (2 cases).

Among the 111 ovarian tumors, 10 (9%) were borderline tumors, including 4 serous and 6 mucinous tumors. Additionally, we identified 7 sex cord stromal tumors (6.3%), comprising 3 granulosa cell tumors, 2 Sertoli-Leydig cell tumors, 1 gynandroblastoma, and 1 androgen-secreting tumor of unspecified type. Furthermore, there were 21 germ cell tumors (18.9%), consisting of 9 mixed germ cell tumors, 5 immature teratomas, 4 yolk sac tumors, and 3 dysgerminomas.

We also observed two cases of metastatic tumors, along with two other rare tumors, namely granulocytic sarcoma and hemangioendothelioma.

The median age of the patients was 32 years, ranging from 13 to 40 years.

Among the secondary treatments administered, 5 patients underwent surgery, 23 received chemotherapy, 1 received radiotherapy (for the androgen-secreting tumor), and 31 patients did not receive secondary treatment at our facility.

It is important to note that many serous tumors were not graded, as they are generally assumed to be high-grade by nature. Sex cord and germ cell tumors are typically not graded.

Table 1. Histological Distribution of the study patients

Histiopathological pathological classification (n=111)	**Frequency**	**Percent**	**Notes**
Epithelial	79/111	71	
Serous	31	28	2 with sarcomatous Changes
Mucinous	23	21	2intestinal Subtypes
Endometrioid	11	10	
Cell Clear	2	1.8	
Not specified	2	1.8	
Non epithelial	32	29	
Germ cell tumours	21	18.9	
Mixed GCT	9	8.1	
Immature teratoma	5	4.5	
Yolk sac	4	3.6	
Dysgerminoma	3	2.7	
Sex cord stromal	7	6.3	
Granulosa	3	2.2	
sertoli-leydic	2	1.8	
Gynanroblastoma	1	0.9	
Androgen secreting tumor	1	0.9	
Others	4	3.6	
Metastatic	2	1.8	
Hemangio-endothelioma	1	0.9	
Granulocytic sarcoma	1	0.9	
Borderline	10	9	4 serous,6mucinous

Note: Description done on the initial 111 patient with ovarian tumor.

Table 2. Tumour Types distribution

Tumor	**Frequency**	**Percent %**
Epithelial tumour	64	69.6
Non-epithelial tumour	28	30.4
Total	92	100

Table 3. Histological type distribution

Histology	**Frequency**	**Percent**
Epithelial	64	68.8
Sex cord Stromal	4	4.3
Germ cell	21	22.6
Other	4	3.2
Total	93	100

Table 4. Grade of tumour

Grade	Frequency	Percent%
Well Differentiated	15	16.1
Moderate	13	14.0
Poor	21	22.6
Not described	44*	47.3
Total	93	100

4. Discussion

In our study, epithelial cancers accounted for 69% of the cases, with the most common histological type being serous cystadenocarcinoma (28%). Germ cell tumors constituted 23% of the cases. These findings align with a previous study conducted in eastern India (16), which reported similar results across all age groups. In that study, the most prevalent histological types were serous cystadenoma (30%), mature teratoma (16%), and mucinous cystadenoma (11%). Additionally, the proportion of epithelial tumors was 61%, and serous cystadenoma was also the most common malignant tumor, consistent with our findings.

5. Conclusion

Based on our study findings, we draw the following conclusions:

1. Even among women aged 40 years and younger, 70% of ovarian tumors were epithelial in histological type, with serous ovarian cancer being the most common.
2. Germ cell tumors constituted 20% of the ovarian cancers, with mixed malignant germ cell tumors being the most prevalent subtype.
3. The survival rates were 82% for epithelial tumors and 96% for non-epithelial tumors. For early-stage disease, the survival rate reached 100%, whereas for advanced stages, it decreased to 73%.

Conflicts of Interest: Author declares no conflict of interests.

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