IJCRR
Section: Healthcare
ISI Impact Factor
(2019-20): 1.628
IC Value (2019): 90.81
SJIF (2020) = 7.893

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An Overview of Malignant Ovarian Tumors at a Tertiary Care Institute of Eastern India

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ABSTRACT

Introduction: Ovarian tumours are common in women of all age groups. Around 2, 39,000 new cases of ovarian cancer (OC) are found worldwide annually. The incidence rate is maximum among post-menopausal women. The prognosis of malignant ovarian tumours is the worst in comparison to other malignancies of the female genital tract and they even have the highest case fatality rate.

Objectives: To study the clinical features, mode of presentation, assessment of risk factors associated with malignant ovarian tumours and the treatment modality.

Material and Methods: A total of 62 cases of malignant ovarian tumours were included in this prospective hospital-based study.

Results: Most of the patients (30.65%) were in the age group of 50-59 years. Most of the cases presented with pain in the abdomen=56(90.34%). 53.23% were diagnosed in stage 1 of the disease. Primary surgery was performed in 87.1% of cases. 54.9% of the patients who presented with features of malignancy were post-menopausal.

Conclusion: The mean age of the cases presenting with ovarian tumours was 47.1. Serous cystadenocarcinoma was the most common type of histopathological variety.

Key Words: Malignant Ovarian Tumours, Papillary, Serous, Adenocarcinoma, Chemotherapy, Adnexa

INTRODUCTION

Ovarian tumours are common in women of all age groups.^{1,2,3} Around 2,39,000 new cases of ovarian cancer (OC) are found worldwide annually and the incidence rate is maximum among post-menopausal women.⁴ The gold standard of ovarian tumour markers is CA-125, which together with Ultrasound findings is typically used in predicting the malignancy of an adnexal tumour. With a wide range of potential causes, and with a wide range of treatment options, precise diagnosis of an adnexal mass is important. Once an ovarian tumour is diagnosed, the management varies, ranging from surgical removal to chemotherapy or radiotherapy. Risk factors for ovarian carcinoma, in general, includes age greater than 50 years, inherited gene mutations, early menarche and late menopause, drugs used for fertility treatment, polycystic ovarian syndrome. The incidence of adnexal masses undergoing surgical intervention is 5.26% of which 93% are ovar-

ian in origin.⁵ The purpose of this study is to evaluate the clinical features, mode of presentation, assessment of risk factors associated with malignant ovarian tumours and the treatment modality.

MATERIAL AND METHODS

A prospective observational study was conducted in the department of Obstetrics and Gynaecology, Institute of medical sciences and SUM Hospital, Siksha 'O' Anusandhan Deemed to be University Bhubaneswar over 2 years, after formal written consent.

Inclusion criteria

- Women who presented with ovarian masses were willing to participate.
- Patients who have given informed consent.

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ISSN: 2231-2196 (Print) ISSN: 0975-5241 (Online)

Received: 18.02.2021

Revised: 11.03.2021

Accepted: 14.04.2021

Published: 26.05.2021

Exclusion criteria:

- Pregnancy at the time of examination.
- Patients declining participation.
- Pelvic tumours were other than ovarian tumours.

Oral and or written informed consent were taken as required by the local ethics committee.

A standardized history was taken for clinical information from each patient.

All the participants were subjected to trans-abdominal / Transvaginal ultrasonography.

CT scan and MRI was carried out for some cases to see for the metastatic deposits elsewhere.

Serum levels of CA 125 were estimated.

The final diagnosis was based on histopathological examination, which is considered as gold standard.

The statistical analysis was performed using SPSS software.

RESULTS

Out of 62 cases, 30.65% were noted in the 50-59 years of age group, followed by 24.19% in less than 40 years of age and 40-49 years age group. (Table no.1). The mean age of presentation was 47.1 years. The most common presenting symptom is pain in the abdomen (90.34%) which is followed by irregular cycles and mass per abdomen (3.22%). Abdominal distension (1.61%) and menorrhagia (1.61%) are the least common presenting symptoms. The detailed clinical presentation is depicted in Table no.2.

Figure 1 shows the frequency of occurrence of malignant ovarian tumours in nulliparous and parous women. Parous women have been shown to have the maximum malignant potential than nulliparous women (43.55%). Figure 2 depicts the association of menstrual history with ovarian malignancy. This study shows that post-menopausal women are at the highest risk of having the malignant potential of the tumour (54.9%) and the least cases are seen in those who underwent surgical menopause (4.8%). Figure 3 shows the association of Hypertension and Type 2 DM in the cases under study. Hypertension is seen in 16.12% of the cases and Diabetes Mellitus is seen in 8.06% of cases. The number of patients with both hypertension and type 2 DM as risk factors are seen in 6.45%. The majority of the cases are seen to have no major risk factors associated. Table no. 3 depicts the occurrence of different stages of malignant ovarian tumours. Out of 62 patients under study, the maximum (n=33) are seen in Stage I accounting for 53.23%, and among them, the most cases are in Stage IA with 45.16%. The second most common occurrence is seen in stage III (35.48%), with maximum cases in Stage IIIC (20.97%). Figure 4 shows the various

treatment modality. Primary surgery is the treatment modality of the majority number of cases (n=54) with 87.1% cases. It is followed by chemotherapy for advanced cases. Primary chemotherapy was given to eight cases who were in the advanced stage of the disease or who were unfit for the surgery accounting for 12.9% of cases. The prognosis was bad for the advanced cases. Table 4 shows the frequency of histological diagnosis of the cases. The study shows that, of the sixty-two cases, the majority are primary malignant tumours (n= 61) and only one case is metastatic. Surface epithelial tumours are the most occurring tumours shown in this study with 87%, with a serious variety having the maximum number of the cases (n=34) having 54.8% followed by mucinous variety with 27.42%.

The second common histological variant seen in the study is sex cord-stromal tumour having 8.06% of cases. Among them, granulosa cell tumours are having maximum occurrence.

Germ cell tumour is seen in two cases with 3.22%. In one case each immature teratoma and mixed germ cell tumour are seen in this variety. The least common histopathological variety is metastatic tumours, seen in only one case (n=1) with 1.61%. Figure 5 shows the comparison of histopathological classification of various studies which was comparable with our study.

Ultrasonography and Color Doppler examination were done to support the clinical diagnosis and elevated CA-125 levels. The ultrasonographic findings suggestive of malignancy are irregular, large solid tumour, presence of papillary projections, multilocular cysts, ascites and high Doppler content on colour Doppler. CT scan was carried out for 21 cases to see for the metastatic deposits elsewhere. MRI was done for 5 cases and the diagnosis was based on the presence of solid/cystic mass with papillary projections, thick septa in the cystic lesion.

DISCUSSION

Ovarian cancer is the leading cause of death among gynaecological malignancies.⁶ It is mostly diagnosed late in advanced disease with difficulty in treatment, high rate of recurrence and bad prognosis. They occur in all age groups including children, adolescence and old age. In our study, 50-59 years (30.65%) is the most common age group for ovarian malignancy. Chandanwale et al. in their study found that the most common age group for malignant ovarian tumours was 51–60 (26%) years compared to our study.⁷ Some other studies have found that 41–60 years is the most common age group for ovarian malignancy which are similar to the findings in our study.^{8,9} Naik PS et al. studied 110 cases of surface epithelial tumours (SET) in a 4 years interval.¹⁰ They gave conclusion stating that benign tumours occurred more

in younger age group and malignant SET occurred in elderly a woman which was found with our study.

In our study, the mean age of presentation was 47.1 years. The mean age of malignancy was 51.9 years according to a study by Okugawa et al.¹¹ This variation depends on the stage of presentation of disease and the type of study done. In a study by Chandanwale et al the mean age was younger, 45.4 years, whereas, a significant proportion of ovarian malignancies were found in women aged less than 40 years in some studies.⁷⁻⁹ This study has shown that post-menopausal women were most commonly affected with ovarian malignancy (54.9%).

The incidence of malignancy was found more common in multiparous women (43.55%) in our study. Eleven cases (17.75%) of malignancy were reported in nulliparous women.

The presence of comorbidities like hypertension and type2 DM were seen to be associated with the occurrence of ovarian malignancy in our study. Hypertension is most commonly seen (16.12%) with ten reported cases followed by Type 2 DM with five cases (8.06%). Both hypertension and type2 DM was seen in four cases (6.45%). The majority of cases seen in our study are primary malignant tumours (n= 61) and only one case is metastatic. Our results are similar to the findings of other studies (12-15). 94% of cases in a study by Chandanwale et al were primary and 6% were secondary.⁷

The most common presenting symptom is pain abdomen (n=56) in our study. Few other studies like Goff et al, Kuladeepa et al. have shown pain and lump in the abdomen as the most common presenting symptom.^{16,17} Pain and the lump in the abdomen (n = 36) were the most common presenting symptom in a study by Chandanwale et al.⁷ This variation can be due to the type of carcinoma under study and the stage of presentation.

Ovarian malignancy has a wide spectrum of histologic division. The frequently encountered tumours are those of surface epithelial tumours which accounts for more than 90% of ovarian tumours.¹⁰ Borderline ovarian tumours are classified separately and diagnosed based on an unusual degree of proliferation with cellular stratification of epithelial cells with atypia and papillary excrescences and absence of stromal invasion. In our study, maximum cases (87%) seen were of surface epithelial tumours, which is corresponding to studies conducted by Granberg and Aslam et al. where the epithelial carcinoma cases accounted for about 80-90% of all ovarian cancers.^{18,19} Similar observations were made by other authors.^{8,9,12,13}

The most common tumour found was serous cystadenocarcinoma in our study which was comparable with several other studies.^{22,23} In a study by Jain R et al. the most common variety was serous (46.2%) followed by mucinous (23.1%)

type. 27.42% of tumours were mucinous cystadenocarcinomas and the second most common type after serous carcinoma in our study.²⁴ Similar results were found by many authors.^{22,23} So we observe that in most of the studies epithelial ovarian tumours were the most common histological variant.

The sex-cord stromal tumours occur at a younger age and are of low grade as compared to surface epithelial malignancies. They manifest clinically from precocious puberty to menorrhagia to post-menopausal bleeding. Dysgerminoma constitutes about 5% of malignant ovarian tumours.²⁵ In our study five cases (8.06%) of sex cord-stromal tumours were seen, of which four were granulosa cell tumours and one sclerosing stromal tumour. Our findings are different from the findings of Chandanwale et al in which 14% (n = 7) of tumours were diagnosed as sex cord-stromal tumours.⁷ Out of two cases of germ cell tumours, one was immature teratoma, one was a mixed germ cell tumour. Malignant germ cell tumours represent 18% of all ovarian cancers and are found in children and young adults.^{26,27} We found one case of metastatic ovarian tumour (Krukenberg tumour) in our study. Similarly, one case was diagnosed as Krukenberg tumour in a study by Chandanwale et al.⁷

In this study, out of 62 cases, 54 cases underwent primary surgery. Among them Stage I (53.23%) is the most common surgical staging, followed by Stage III, Stage II, stage IV having 35.48%, 8.06%, 3.23% respectively. Some literature has shown that complete surgical staging without any residual disease has shown a good prognostic value than incomplete surgical staging or complete surgical staging with residual disease.^{28,29} Primary chemotherapy was given to eight patients in our study as they presented in an advanced stage or were not fit for the surgery. Primary cytoreductive surgery followed by platinum-based multiagent chemotherapy is used in advanced epithelial ovarian cancers.

The blood levels of CA-125 were done for 62 cases and 38 cases showed high levels (>35U/ml), the surface epithelial tumours showed the maximum elevated levels of CA-125 levels. CA-125 has a sensitivity of 61%–90%, specificity of 71%–93%, the positive predictive value of 35%–91%, and a negative predictive value of 67%–90% helps in differentiating benign and malignant tumours.³⁰

CONCLUSION

Ovarian tumours are diagnosed late as it is asymptomatic in the early stages and becomes apparent with abdominal distention caused by ascites or the presence of large tumour causing heaviness or gastrointestinal disturbances. The most common occurrence of ovarian malignancy was seen in the age group 50-59 years. The mean age of presentation was 47.1 years. Pain abdomen was the most common presenting feature. In our study, the maximum cases seen were of surface epithelial

lial origin. The blood levels of CA-125 showed the maximum elevated levels in epithelial ovarian tumours. The modality of treatment was primary surgery in most of the cases. Some authors have shown that complete surgical staging without any residual disease has a good prognosis as compared to incomplete surgical staging or complete surgical staging with residual disease. Time of detection is the most important factor in ovarian malignancy. Significant improvement in survival is possible with early detection of the tumours.

ACKNOWLEDGEMENT

The authors are highly grateful to the Chairman of Siksha 'O' Anusandhan (Deemed to be University), Prof. Manoj Ranjan Nayak for providing the support during the study. The authors are also thankful to the Dean, IMS and SUM Hospital, Siksha 'O' Anusandhan (Deemed to be University), Prof. Gangadhar Sahoo for encouraging and supporting.

Source of Funding: NIL

Conflicts of Interest: There is no conflict of interest among the authors.

Authors Contribution: Mishra SP. Sujata conceived, planned, designed and guided the study. Data collection, data processing, data analysis was done by Dalal C and Voola Sirisha. Voola Sirisha wrote the manuscript.

REFERENCES

- Pavlik EJ, Ueland FR, Miller RW. Frequency and disposition of ovarian abnormalities followed with serial transvaginal ultrasonography. *Obstet. Gynecol.* 2013 Aug 1;122(2 PART 1):210-7.
- Castillo G, Alcázar JL, Jurado M. Natural history of sonographically detected simple unilocular adnexal cysts in asymptomatic postmenopausal women. *Gynecol. Oncol.* 2004 Mar 1;92(3):965-9.
- Borgfeldt C, Adolf E. Transvaginal sonographic ovarian findings in a random sample of women 25–40 years old. *Ultrasound in Obstetrics and Gynecology: ISUOG.* 1999 May;13(5):345-50.
- Ferlay J, Soerjomataram I, Dikshit R. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer.* 2015 Mar 1;136(5):E359-86.
- Granberg S, Wikland M, Jansson I. Macroscopic characterization of ovarian tumours and the relation to the histological diagnosis: criteria to be used for ultrasound evaluation. *Gynecol Oncol.* 1989 Nov 1;35(2):139-44.
- Raja FA, Chopra N, Ledermann JA. Optimal first-line treatment in ovarian cancer. *Ann. Oncol.* 2012 Sep 1;23:x118-27.
- Chandanwale SS, Jadhav R, Rao R, Naragude P, Bhamnikar S, Ansari JN. A clinicopathologic study of malignant ovarian tumours: A study of fifty cases. *Med J DY Patil Vidyapeeth.* 2017 Sep 1;10(5):430.
- Jha R, Karki S. Histological pattern of ovarian tumours and their age distribution. *Nepal Med Coll J.* 2008 Jun 3;10(2):81-5.
- Mankar DV, Jain GK. Histopathological profile of ovarian tumours: A twelve-year institutional experience. *Muller J Med Sci Res.* 2015;6(2):107-1.
- Naik PS, Deshmukh S, Khandeparkar SG. Epithelial ovarian tumours: Clinicopathological correlation and immunohistochemical study. *Journal of Mid-Life Health.* 2015 Oct;6(4):178.
- Okugawa K, Hirakawa T, Fukushima K, Kamura T, Amada S, Nakano H. Relationship between age, histological type, and size of ovarian tumours. *Int. J. Gynecol. Obstet.* 2001 Jul 1;74(1):45-50.
- Garg R, Singh S, Rani R, Agrawal M, Rajvanshi R. A Clinico-pathological Study of Malignant Ovarian Tumors in India. *J Saf.* 2014 Jan 1;2(1):9.
- Al-Harmooshee MB. Comparative Evaluation of Intraoperative Cytology and Histopathology in Ovarian Neoplasms. *Int J Pharm Sci Res.* 2020 Jul;12(2):241.
- Gilani MM, Behnamfar F, Zamani F, Zamani N. Frequency of different types of ovarian cancer in Vali-e-Asr Hospital (Tehran University of Medical Sciences) 2001-2003. *Int J Pharm Sci Res.* 2007 Sep 1;10(17):3026-8.
- Basu P, De P, Mandal S, Ray K, Biswas J. Study of patterns of care of ovarian cancer patients in a specialized cancer institute in Kolkata, eastern India. *Indian J. Cancer.* 2009 Jan 1;46(1):28.
- Goff BA, Mandel LS, Melancon CH, Muntz HG. Frequency of symptoms of ovarian cancer in women presenting to primary care clinics. *Jama.* 2004 Jun 9;291(22):2705-12.
- Kuldeep AV, Muddegowda PH, Lingegowda JB, Doddikoppad MM, Basavaraja PK, Hiremath SS. Histomorphological study of 134 primary ovarian tumours. *Adv Lab Med Int.* 2011;1(4):69-82.
- Granberg S, Wikland M, Jansson I. Macroscopic characterization of ovarian tumours and the relation to the histological diagnosis: criteria to be used for ultrasound evaluation. *Gynecol Oncol.* 1989 Nov 1;35(2):139-44.
- Aslam N, Banerjee S, Carr JV, Savvas M, Hooper R, Jurkovic D. Prospective evaluation of logistic regression models for the diagnosis of ovarian cancer. *Obstet. Gynecol.* 2000 Jul 1;96(1):75-80.
- Garg R, Singh S, Rani R, Agrawal M, Rajvanshi R. A Clinico-pathological Study of Malignant Ovarian Tumors in India. *Journal of SAFOMS.* 2014 Jan 1;2(1):9.
- Al-Harmooshee MB. Comparative Evaluation of Intraoperative Cytology and Histopathology in Ovarian Neoplasms. *Int J Pharm Sci Res.* 2020 Jul;12(2).
- Oliva E, Alvarez T, Young RH. Sertoli cell tumours of the ovary: a clinicopathologic and immunohistochemical study of 54 cases. *Am. J. Surg. Pathol.* 2005 Feb 1;29(2):143-56.
- Young RH, Scully RE. Ovarian sex cord-stromal tumours: recent progress. *Int. J. Gynecol. Pathol.* 1982 Jan 1;1(1):101.
- Jain R, Patel P, Goyal S. Clinico-pathological study of ovarian tumours at tertiary care hospital, Udaipur. *International Journal of Reproduction, Contraception, Obstetand Gynecol* 2021;10:555-2.
- Creasman WT, Fetter BF, Hammond CB, Parker RT. Germ cell malignancies of the ovary. *Obstet and Gynecol.* 1979 Feb 1;53(2):226-30.
- Nakashima N, Nagasaka T, Fukata S. Study of ovarian tumours treated at Nagoya University Hospital, 1965–1988. *Gynecol Oncol.* 1990 Apr 1;37(1):103-11.
- Hawkins EP. Germ cell tumours. *Am. J. Clin. Pathol.* 1998 Apr 1;109(4 Suppl 1): S82-8.
- Cancer registry 2018, National Institute of Cancer Research and Hospital (NICRH), Dhaka, Bangladesh.
- Winter WE, Maxwell GL, Tian C. Tumor residual after surgical cytoreduction in the prediction of clinical outcome in stage IV epithelial ovarian cancer: a Gynecologic Oncology Group Study. *J Clin Oncol.* 2008 Jan 1;26(1):83-9.

30. Sehoul J, Akdogan Z, Heinze T. Preoperative determination of CASA (Cancer-Associated Serum Antigen) and CA-125 for the discrimination between benign and malignant pelvic tumour mass: a prospective study. *Anticancer Res.* 2003 Mar 1;23(2A):1115-8.

Table 1: Age Group distribution

Age group (years)	No. of patients	Percentage (%)
Less than 40	15	24.19
40-49	15	24.19
50-59	19	30.65
60-69	11	17.74
70-79	2	3.23
Total	62	100.0

Table 2: Clinical Presentation of ovarian tumor

Presenting Complaint	No. of Cases	Percentage (%)
Abdominal Distension	1	1.61
Irregular Cycles	2	3.22
Mass per Abdomen	2	3.22
Menorrhagia	1	1.61
Pain in Abdomen	56	90.34
Total	62	100%

Table 3: Staging of ovarian tumor

Stage	No. of Patients	Percentage (%)
I	33	53.23
I A	28	45.16
I B	2	3.23
I C	3	4.84
II	5	8.06
II A	3	4.84
II B	2	3.23
III	22	35.48
III A	2	3.23
III B	7	11.29
III C	13	20.97
IV	2	3.23
IV A	0	0.0
IV B	2	3.23
Total	62	100.0

Table 4: Histopathological Types of the tumor

HP	No. of cases	Percentage
SURFACE EPITHELIAL TUMOURS	54	87%
Serous cystadenocarcinoma	34	54.8%
Mucinous cystadenocarcinoma	17	27.42%
Endometrioid Carcinoma	3	4.84%
Transitional cell Carcinoma	0	
GERM CELL TUMOUR	2	3.22%
Dysgerminoma	0	
Yolk sac tumour	0	
Immature Teratoma	1	1.61%
Mixed germ cell tumour	1	1.61%
SEX CORD STROMAL TUMOURS	5	8.06%
Granulosa cell tumour	4	6.45%
Sertoli cell tumour	0	
Sclerosing stromal tumour	1	1.61%
METASTATIC TUMOURS	1	1.61%
Metastasis from adenocarcinoma colon	0	
Krukenbergtumour	1	1.61%
Metastasis from squamous cell carcinoma- cervix	0	
Total	62	100%

Figure 1: Relationship of Parity with malignant ovarian tumours. **Figure 2:** Menstrual History of the cases

Figure 3: Associated Co-Morbidities

Figure 4: Treatment Modalities used

Figure 5: Comparison of Histopathological classification between various studies Number of cases (%).