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Research Article

Epidemiology of ovarian malignancies

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ABSTRACT

Background: The location of the ovaries makes it difficult to diagnose ovarian cancer at an earlier more curable stage. This study was done with intend of developing insight into risk factors, clinical presentation and prognostic factors for the same.

Methods: An observational prospective study was undertaken over a period of 2 years of 77 cases in a tertiary care hospital with cancer unit. Case records of cases during study period were evaluated and epidemiology studied.

Results: Most of the malignant tumors i.e. 35.1% were in the age group of 40- 50 yrs and 42 % of tumors seen in the age group of 41-60 years. 9.1% were post hysterectomy, 46.8% were premenopausal and 44.2% were postmenstrual. Majority cases were parous women and none had used oral contraceptive pills. In the present study, blood group A was found more commonly associated with ovarian tumors in comparison to the general population. the most common complaint of the patient was pain in abdomen (70.1%) followed by distension of abdomen (45.5%) and menstrual irregularities (16.9 %).

Conclusions: The epidemiology and presentation of ovarian tumours has remained unchanged since last 3 decades. Nulliparity is not as significant a factor in the aetiology of ovarian malignancy however contraception leading to anovulatory cycles (OC pills) may have a protective role. Infertility can be suggested as a risk factor but the treatment for infertility & its role in oncogenesis remains controversial.

Keywords: Ovarian Malignancies, Ovarian tumours, Epidemiology

INTRODUCTION

Howard Taylor once said "Ovarian malignancy is a group of disease and not a single one". The tremendous diversity of malignancies associated with the ovary makes it a difficult subject to study. Because of the location of the ovaries, it is difficult to diagnose ovarian cancer at an earlier more curable stage. Ovarian cancer does not cause any specific signs or symptoms until late, when it metastasises. Symptoms suggestive of ovarian cancer include bloating, pelvic/ abdominal pain, difficulty

in eating or feeling full quickly and urinary symptoms (urgency/frequency).Till date no screening strategy has been found to be effective in the early diagnosis of the disease with resultant reduction of mortality. This study was done with intend of developing insight into risk factors, clinical presentation and prognostic factors for the same.

The objective of the study was

- 1 To study the the epidemiological factors of Ca ovary.

- 2 To study various clinical presentations / stage of presentation of Ca ovary.
- 3 To study the contributory factors and identify prognostic factors (if any)
 - a. Age.
 - b. Parity.
 - c. Ethnicity.
 - d. Use of oral contraceptive pills, e.t.c.

METHODS

The present study of ovarian tumors was undertaken in Cama Albless Hospital, Mumbai, a tertiary hospital with cancer unit for a period of 2 years. This was an observational prospective study of 77 cases after ethical committee clearance and consent from each patient who participated in the study.

Inclusion criteria

Patients with proven histopathological diagnosis or cytological diagnosis of ovarian cancer of all age group were included in this study. Cases of adnexal mass with doubtful diagnosis were excluded.

A detailed history was elicited, thorough clinical (general, systemic and pelvic) examination done and clinical diagnosis was put forward. The clinical diagnosis was corroborated with the diagnosis put forth by USG (transabdominal/transvaginal), CT/MRI, serological markers and impression of FNAC (USG guided), fluid cytology. Histopathological diagnosis was taken as the "gold standard" for final diagnosis.

Case records of cases during study period were evaluated and epidemiology studied.

RESULTS

The present study is an observational prospective study of 77 cases of ovarian malignancy over a period of 2 years. The following results were obtained.

Table 1: Age distribution of ovarian tumors (N=77).

AGE (years)	No. of cases	%
10 to 20	4	5.2
20 to 30	12	15.6
30 to 40	12	15.6
40 to 50	27	35.1
50 to 60	13	16.9
> 60	9	11.7
Total	77	

Mean age: 45.18 years

Malignancy is more commonly seen with increasing age. Most of the malignant tumors i.e. 35.1% (27 cases) were in the age group of 40- 50 yrs and 42 % of tumors(40 cases) seen in the age group of 41-60 years.

Youngest patient with malignant ovarian tumor was at age of 13 years. i.e. dysgerminoma. Oldest patient with malignant ovarian tumor was 75 years of age with adenocarcinoma.

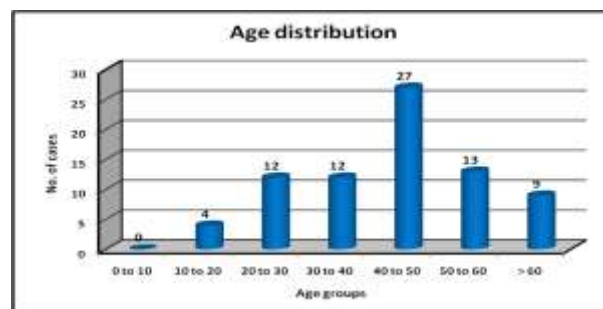


Figure 1(a): Age distribution of ovarian tumors (N=77).

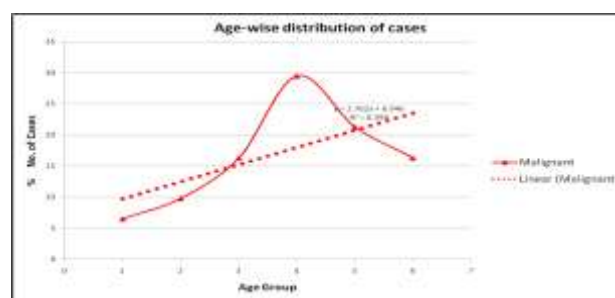


Figure 1(b): Age distribution of ovarian tumors (N=77).

Table 2: Religion distribution (N=77).

Religion	No. of cases	%
Hindu	59	76.6
Muslim	16	20.8
Christian	2	2.6
Total	77	

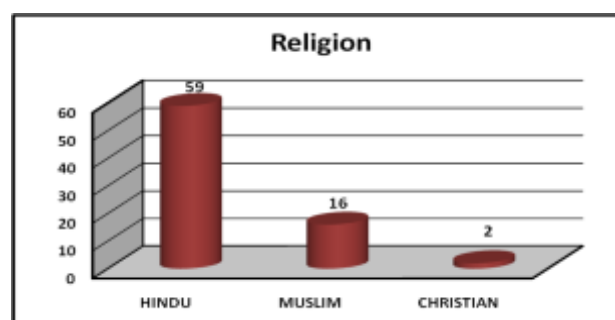


Figure 2: Religion distribution (N=77).

In the present study, 76.62% (59 cases) were Hindus.

Table 3: Occupation distribution (N=77).

Occupation	No. of cases	%
Housewife	69	89.6
Student	4	5.2
Govt. Servant	2	2.6
Daily wages	2	2.6
Total	77	

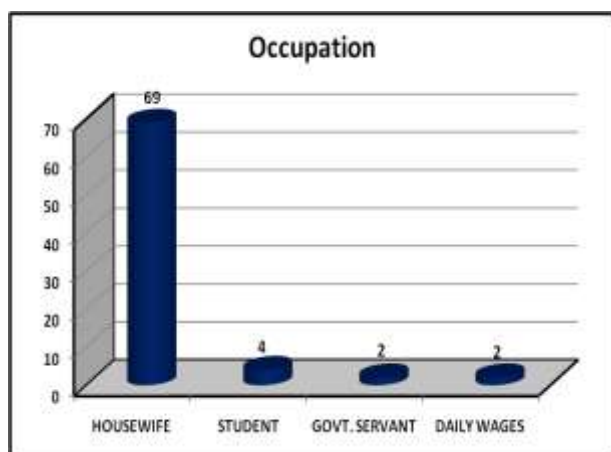


Figure 3: Occupation distribution (N=77).

Most of the cases (89.6%; 69 cases) were unemployed/housewives.

Table 4: Menstrual status (N=77).

Menstrual status	No. of cases	%
Premenopausal	36	46.8
Postmenopausal	34	44.2
Post hysterectomy (Surgical menopause)	7	9.1
Total	77	

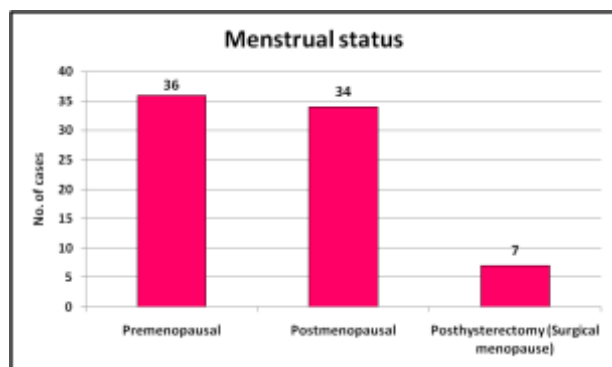


Figure 4: Menstrual status (N=77).

9.1% (7 cases) were post hysterectomy, 46.8% (36 cases)

were premenopausal and 44.2% (34 cases) were postmenstrual.

Table 5: Parity distribution of ovarian tumors (N=77).

Parity	No. of cases	%
Nullipara	14	18.2
Para 1	6	7.8
Para 2	21	27.3
Para 3	17	22.1
Para 4	8	10.4
Para 5 & above	11	14.3
Total	77	

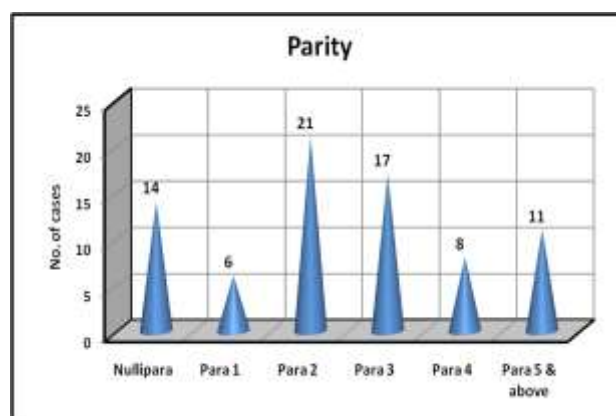


Figure 5(a): Parity distribution of ovarian tumors (N=77).

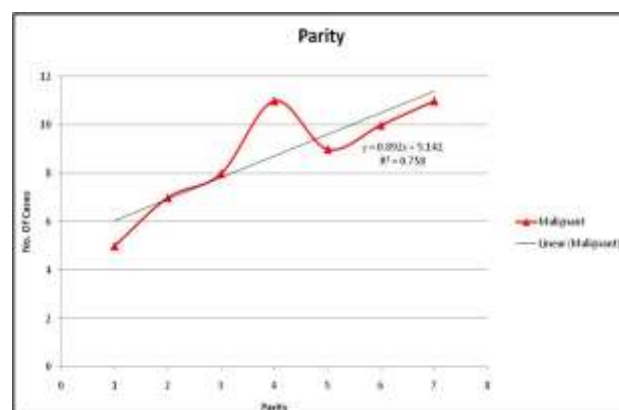


Figure 5(b): Parity distribution of ovarian tumors (N=77).

In present study 18.2% (14 cases) were nulliparous and 7.8% (6 cases) were para 1.

Table 6: Contraception (N=77).

Contraception	No. of cases	%
Tubal ligation	19	25
No contraception	58	75
Total	77	

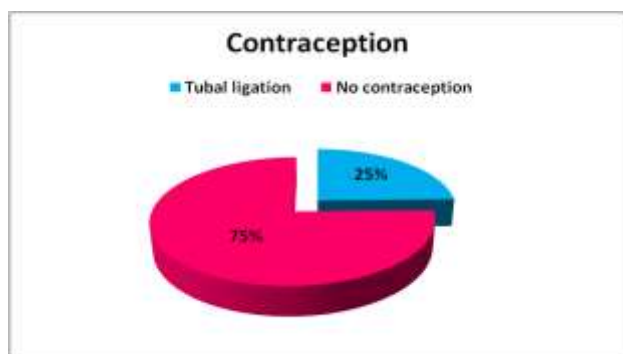


Figure 6 (a): Contraception (N=77).

25 % (19 cases) had undergone tubal ligation, 75% (58 cases) had not used any form of contraception in their life. None of the cases had taken oral contraceptive pills.

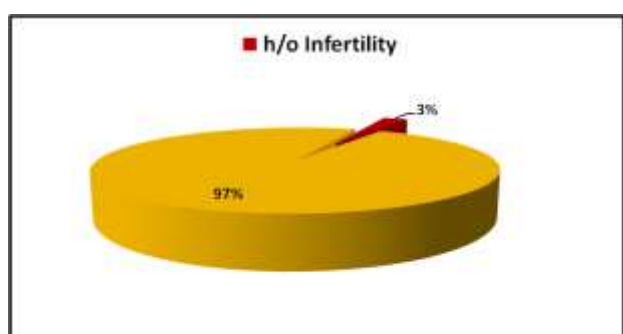


Figure 6 (b): Infertility (N=77).

3% of cases in the study had history of infertility.

Table 7(a): Blood group distribution (N=77).

Blood Group	No. of cases	%
A Positive	27	35.1
B Positive	17	22.1
AB Positive	6	7.8
O Positive	26	33.8
A Negative	0	0
B Negative	1	1.3
AB Negative	0	0
O Negative	0	0
Total	77	

Table 7(b): Blood group distribution (N=77).

Blood Group	Present study (%)	Normal population (%)	'P'
A	35.1	22	<0.01
B	23.4	33	0.55 (NS)
AB	7.8	7	0.48 (NS)
O	33.8	37	0.52 (NS)

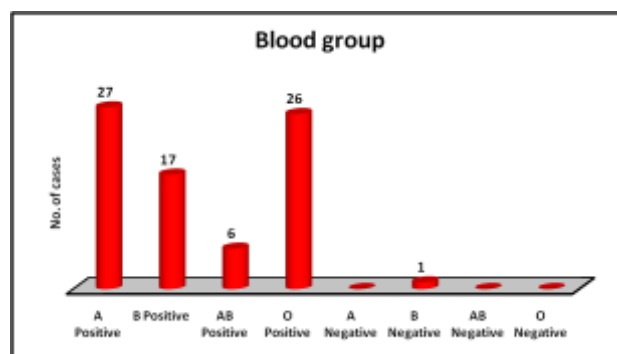


Figure 7: Blood group distribution (N=77).

Table 8: Presenting symptom (N=77).

Symptom	No. of cases	%
Pain in abdomen	54	70.1
Distension of abdomen	35	45.5
Lump abdomen	6	7.8
Menstrual irregularities	13	16.9
Urinary complaints	4	5.2
Bowel complaints	3	3.9
PV Discharge	3	3.9
Weight loss	3	3.9
Lump in breast	1	1.3
Inguinal swelling	1	1.3
Post menopausal bleeding	1	1.3

Table 9: Duration of symptoms (N=77).

Duration of symptoms	No. of cases	%
< 1 month	4	5.2
1 month	13	16.9
2 months	18	23.4
3 - 6 months	15	19.5
6 - 12 months	12	15.6
> 12 months	8	10.4
Total	77	

Table 10: Stage at presentation (N=77).

Clinical Staging	No. of cases	%
Stage 1	26	33.8
Stage 2	7	9.1
Stage 3	25	32.5
Stage 4	19	24.7
Total	77	

In present study, maximum ovarian tumors cases 35.1% (27 cases) had blood group A positive (Table 7(a)).

In the present study, blood group A was found more commonly more commonly associated with ovarian tumors in comparison to the general population.

In present study, the most common complaint of the patient was pain in abdomen 70.1% (54 cases) followed by distension of abdomen 45.5% (35 cases) and menstrual irregularities 16.9% (13 cases) (Table 8, Figure 8).

In our study, 45.5% (35 cases) had vague complaints for > 3 months and 10.8% (8 cases) had complaints > 12 months which were not recognized (Table 9, Figure 9).

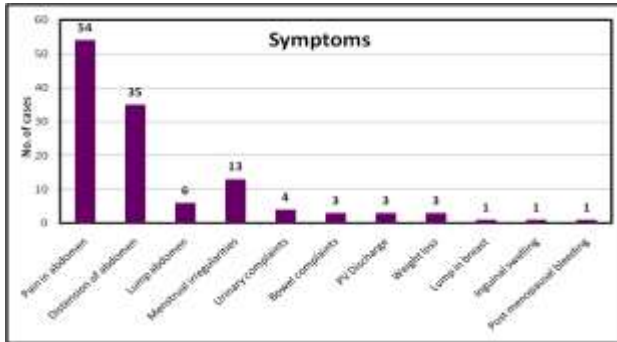


Figure 8: Presenting symptoms (N=77).

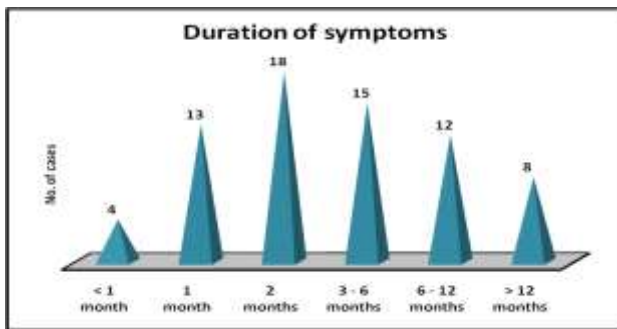


Figure 9: Duration of symptoms (N=77).

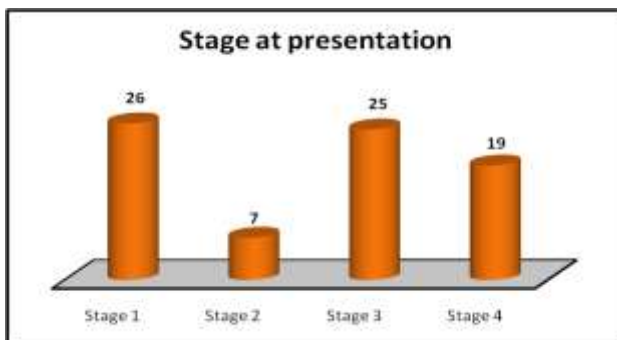


Figure 10: Stage at presentation (N=77).

The early symptoms of ovarian cancer are often overlooked as digestive problems of middle aged woman. The frequent initial presenting complaints are abdominal discomfort, bloating sensation, early satiety and dyspepsia. Distension of abdomen, feeling of heaviness/mass in abdomen and pain occurs relatively late, when the mass exceeds 15 cm in size/ascitis appears. Often there is visible weight loss due to loss of appetite.

At an advanced stage patient may present with constipation due to intestinal obstruction or dyspnea due to pleural effusion. Due to the fact that ovarian cancers more often than not become symptomatic only when the disease becomes extra ovarian, in our study 57.2% (44 cases) presented in advanced stage (stage 3/4) (Table 10, Figure 10).



Figure 11: Serous cystadenocarcinoma.

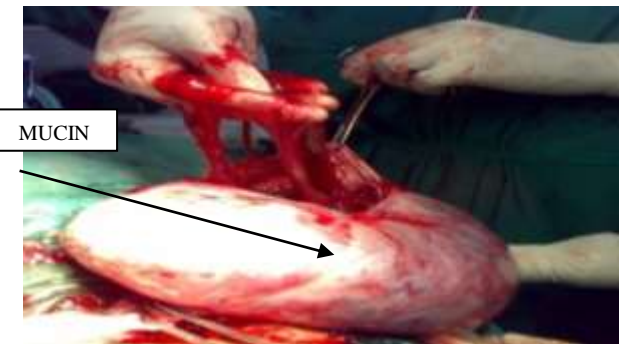


Figure 12: Mucinous cystadenocarcinoma.

DISCUSSION

Ovarian tumors are amongst the top five common tumors and second most common among gynecological malignancies among Indian women. It is a unrecognized threat to women's health. Its incidence is on the rise in countries like India. In Mumbai its incidence rate is 6.1 per 100,000 females with a truncated rate (age 35-64) of 14.2 per 100,000 females.

Ovarian carcinogenesis, as in most cancers involves multiple genetic alterations. A full understating of the earliest recognizable events in epithelial ovarian carcinogenesis is limited by the lack of a well-defined premalignant state common to all ovarian subtypes and by the paucity of data from early stage cancers.

Age incidence

Ovarian malignancies can occur at any age though the age range varies according to the histological types. Germ cell tumors are more common in < 20 years of age whereas epithelial tumors are seen in women older than

50 years. In our study the highest incidence was seen in age group 40-50 years. The mean age of the patients was 45.18 years (Table 1, Figure 1a).

Age per se, had no correlation to the development of an ovarian tumor. The youngest patient in our study was 13 years with dysgerminoma while oldest patient was 75 years with serous papillary adenocarcinoma. Our study correlated with most of the studies as compared in the table below:

Table 11: Age distribution in different studies.

Sr no	Study	Age (years)
1	Kurman RJ 1994 ¹	50
2	S Shah et al 2006 ²	>40
3	Rama Mani et al 2007 ³	>50
4	Basu P et al 2008 ⁴	48.8 +/- 11.2
5	Present study 2010	40-50

Parity

It has been shown that with each full ovulation year, a woman experiences 6% increase in risk of ovarian cancer. These findings are especially true in 20-29 years age group in which risk is highest, with 20% increase in risk with each ovulatory year a woman experiences.⁵

Out of the study 18.2% (14 cases) were nulliparous and 7.8 % (6 cases) were para 1 (Table 5, Figure 5a).

National Survey of Ovarian Cancer, USA (1992) showed only 8.2% patients were Nulliparous.⁶

Shah et al observed ovarian tumours were more common in multiparous patients'. Only 18.6% of patients were nulligravida and 4% patients had tumor associated with pregnancy. 54% among benign and 75% among malignant tumours were multiparous.²

Fatima Zahra et al observed that out of 62 cases 16 (26%) were Nulliparous and 46 (74%) were multiparous. Among multiparous there were 27 cases (44%) who had parity 1-4 and 19 cases (30%) who had parity >5. Fatima Zahra et al observed that in patients with ovarian carcinoma maximum patient parity 3 and above. Hence nulliparity is not a significant factor in aetiology of both benign and malignant tumors.⁷

Hence, null parity was not found as a significant factor in aetiology of malignant tumours in our study (Figure 5b). Other protective factors for ovarian malignancy are tubal ligation and hysterectomy. These surgical procedures decrease risk of ovarian cancer by 30-40%.⁸ The postulated mechanism is prevention of preventing potential carcinogens from ascending to the ovary or reduced blood flow to the ovary. 75% of our patients used no contraception while 25% had undergone tubal ligation. (Table 6, Figure 6a).

None of our patients were found to have ever taken oral contraceptive pills. 9% (7 cases) had undergone hysterectomy (Table 4, Figure 4).

Infertility also has been suggested as a risk factor for ovarian cancer but the treatment for infertility and its role in oncogenesis remains controversial.⁹ Numerous studies link endometriosis, a well-established cause of infertility, with an increased risk of ovarian cancer especially clear cell and Endometrioid subtype (39.2% and 21.2% respectively).¹⁰⁻¹³

The findings on ovarian cancer risk and its association with fertility drug treatment are not definitive and studies have not shown a direct correlation.¹⁴

In our study, 3% of patients had infertility (Table 6b). Out of these, one case had history of ovulation induction (6 cycles).

Our study is correlated with other studies in the table below:

Table 12: Comparison of symptomatology in different studies^{19,20,2}:(Percentage of cases).

Complaints	Goff-2004	Olsen 2001	S Shah 2006	Present study 2010
Distension abdomen	70	71	31	45.5
Lump abdomen	64		66	7.8
Pain abdomen	50	52	100	70.1
Menstrual Complaints	-	-	-	16.9
Bladder complaints	55	33	-	5.2
Bowel complaints	-	21	-	3.9
White Discharge	-	-	-	3.9
Weight Loss	-	-	-	3.9
Pelvic pain	41	-	-	-
Fatigue	-	43	-	-
Infertility	-	-	8.6	3

Blood group

In present study, maximum ovarian tumors cases 35.1% (27 cases) had blood group A positive (Table 7a, Figure 7).

In the present study, blood group A was found more commonly in comparison with general population (Table 7b).

Henderson J, et al found that ovarian cancer was more common in women of blood group A than in others, with a relative incidence of 1.17. In particular; adenocarcinomas were the most common type of tumor and were associated with blood group A. The association was more striking in married women than in single women probably reflecting differences associated with parity.

Björkholm E, Sweden also found that the disparity between the frequencies of blood groups A and O appeared to increase the risk of ovarian carcinoma by 19%.¹⁶

Occupation

89.6% (69 cases) in our study were unemployed/housewives (Table 3, Figure 3). No case had history of occupational exposure to talc, silica dust, aliphatic and aromatic hydrocarbons which have been suggested as risk factors in various studies.^{17,18}

Symptomatology

It is a well known fact that ovarian tumors more often than not present with vague symptoms and that is the reason for their being diagnosed late.

CONCLUSIONS

Ovarian tumors are known to be enigmatic in behaviour, unclear in pathogenesis and controversial in terms of management. Further in terms of management, there are options of fertility conserving surgery in relatively younger women harbouring borderline tumors. Unlike invasive adenocarcinomas that are candidates for radical surgery with options of chemotherapy. Proper understanding of pathogenesis, complete investigation and thorough surgical staging are the cornerstones of management.

- The epidemiology and presentation of ovarian tumors has remained unchanged since last 3 decades.
- Malignancy is commoner with increasing age. However in first 2 decades germs cell tumour are common.
- Nulliparity is not as significant a factor in the etiology of ovarian malignancy however contraception leading to anovulatory cycles (OC pills) may have a protective role. Even tubal ligation could be having a protective role.
- Infertility can be suggested as a risk factor but the treatment for infertility & its role in oncogenesis remains controversial
- Pain in abdomen is a common complaint in the varied and vague presentation of ovarian tumors Followed by distention of abdomen and menstrual irregularity.

- The early symptoms of ovarian tumors are often overlooked as “digestive problems” of a middle aged woman. Most women who complain of these symptoms will not have ovarian cancer. However, recognizing that the new onset or increased severity of these symptoms in collaboration with ultrasonography especially T.V.S. provides an important diagnostic opportunity.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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