Research Article

Trends of Ovarian Masses in a Tertiary Centre of Armed Forces of India

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Abstract

Background: In the recent years, there has been a surge in incidence of cancers globally. Not only is the incidence of cancer, even the case fatality rate due to malignancies on the rise in last few years. Gynecological malignancies are one among the commonest malignancies affecting the life of women worldwide. Ovarian cancer is the seventh most common cancer of the world with a lot of bearing on life of a female patient. Most of the patients present with advanced disease due to non-specific symptoms & no definitive screening method available. Keeping in view these rising trends of ovarian masses in recent past, this study was undertaken to see the patterns of ovarian masses in a tertiary centre of armed forces of India.

Materials and methods: This is a retrospective study of patients with ovarian masses who visited the gynec-oncology OPD of a tertiary care hospital of armed forces of India from Jan 2018 to Jan 2020 for treatment at our centre. In all cases with ovarian masses, a detailed history taking followed by clinical examination was done. Further evaluation with special investigations like USG/CT/MRI, Tumor markers including ROMA score/RMI scoring and tissue biopsy if need be, to establish malignancy was done on case to case basis. Depending upon the provisional diagnosis of mass & extent of disease, patients underwent either primary surgery for pseudo tumor/benign mass/malignant mass with early stage or were treated with NACT followed by surgery in cases of advanced malignant ovarian masses.

Results: During the entire duration of study, 109 patients presented with various types of ovarian masses at our centre. Pseudo-tumors of the ovary were the most common ovarian masses reported at our centre followed by benign & malignant ovarian masses. Out of total 109 patients with ovarian masses at our centre 40 patients had pseudo-tumors of ovary, 35 had benign ovarian masses & 34 had malignant ovarian masses. Out of 40 cases of pseudo-tumors of ovary, 22 patients had endometriomas of variable sizes ranging from 4 cms to 20 cms, 4 patients had peritoneal inclusion cyst post hysterectomy, 4 patients had infective masses (Tubercular) 3 patients had para-ovarian cysts, 2 had broad ligament fibroid mimicking ovarian mass, 3 patients had torsion of ovary including a premenarchal girl of 9 years & 2 cases of chronic ectopic. Thirty five patients presented with benign tumors of ovary including 18 patients with serous cyst adenoma of ovary, 7 mucinous cyst adenoma of ovary & 10 patients with dermoid cyst of the ovary. Out of 34 patients with malignancy, 22 patients had serous cyst adenocarcinoma, 5 had mucinous cyst adenocarcinoma, 1 patient had borderline serous papillary carcinoma of ovary, 2 patients had Germ cell tumor of the ovary & 5 had sex cord stromal tumors predominantly granulosa cell tumor of the ovary. Three patients had advanced epithelial cancer of the ovary at a very young age less than 25 years. Most of the malignant masses were present in the postmenopausal age group barring 2 cases of germ cell tumors & one patient with borderline ovarian tumor. One patient had term pregnancy with ovarian mass which turned out to be fibroma on frozen section intra-op.

Conclusion: To conclude 109 patients reported with ovarian masses at our Centre in last 2 years. Pseudo-tumors of the ovary were the most common followed by benign & malignant ovarian masses tumor at our Centre. Incidence of advanced epithelial cancer is on the rise in younger population.

Keywords: Gynecological cancer; Pseudo-tumor; Ovarian mass

Introduction

Cancers form a major burden of morbidity and mortality worldwide. Case fatality rate due to this entity is on the rise in the present scenario. Even the incidence of gynecological cancers is on the rise since the last decade. Ovarian cancer ranks seventh in the incidence of cancers worldwide. However there is a rising trend in the incidence of ovarian masses in the yester years & it is even bypassing the cervical cancer as the most common cancer in certain parts of India. Incidence of ovarian cancer in USA is 2.5% of all cancers but causes 5% of cancer deaths. India ranks third in the list of countries with highest incidence of female cancers after China & USA & is second to China in the incidence of ovarian cancer in the world. Ovarian tumors contributes 30% of all female genital tract cancers [1]. In the year 2000 the total number of ovarian cancer cases worldwide were 1, 92,000 [2]. Major factor contributing to rising incidence of ovarian masses is the longevity of age and postmenopausal ladies are contributing 80% of this rise. In 2005 the incidence of ovarian cancer varied from 1.7% to 8.7% in various urban and rural populations based registries [3]. Five year survival is to the tune of 25% in advanced ovarian malignancies [4]. Survival rates are better in younger population with early disease. The origin of ovarian cancer is still debatable. Anatomical location of the ovary is responsible for its late presentation and associated management difficulties. Depending upon the age related risk, a high index of suspicion is required and appropriate tumor markers and imaging should always be implemented for earlier diagnosis to reduce the burden of morbidity and mortality from this dreadful disease. More so all ovarian masses are not malignant & there is a wide variation in patterns of ovarian masses seen in routine OPD settings, so understanding the origin of ovarian cancer and the specific histological types is of prime importance in diagnosing as well as offering the specific treatment.

Due to wide variations in the distribution & frequency of ovarian masses, this study aimed to highlight the patterns of ovarian

masses at our centre. More so a composite data is easily available for western world countries but no such organized data exists for Indian population & that too for armed forces.

Material and Methods

This is a retrospective observational study conducted in the department of obstetrics and gynecology in a tertiary hospital of armed forces of India from Jan 2018 to Jan 2020.

Sample population

All cases with ovarian masses who visited the gynec-oncology out-patient department of our centre were enrolled. A detailed history taking followed by examination and a particular set of investigations were done as per the tumor types.

Method of study

The patients with ovarian masses attending the out-patient department of gynec-oncology clinic at our hospital were examined clinically after detailed history taking including age, residential address, marital status, and parity & sterilization status. Based on clinical examination & investigations including imaging & tumor markers, treatment plan in the form of surgery or chemotherapy was formulated. Information related to the disease like symptoms, site, size & stage of tumor if malignant & treatment given was noted as per the standard proforma. Data collected was analyzed to see the trends of ovarian masses in our study. Microsoft excel was used to analyze the data & descriptive statistics were expressed as percentage.

Observations and results

In the present study, during the span of 2 years from Jan 2018 to Jan 2020 total 109 patients were admitted with ovarian masses at our institute against total admissions of 2000 in gynecology ward. Incidence of ovarian masses was 5.45% in our study. Incidence of ovarian neoplasm (both benign & malignant) was 3.45%. Pseudo-tumors of the ovary were seen in 40 cases, 35 patients had benign ovarian tumors & 34 patients had malignant ovarian masses. The incidence of various types of ovarian masses at our centre is shown in Table 1. Eighty nine patients with ovarian masses in our study underwent primary surgery (Laparoscopy/Laparotomy) in view of pseudo-tumor/benign/early ovarian cancer. Twenty patients had malignant ovarian masses with advanced disease at the time of presentation & underwent NACT followed by surgery.

Pseudo-tumors of the ovary were the most common presentation of ovarian masses at our centre with endometriomas being the most common pseudo-tumor. Besides endometriomas, 3 patients had para-ovarian cysts, 2 patients presented with broad ligament fibroid mimicking ovarian mass. Three patients had torsion of one of the ovaries and presented with acute abdomen with ovarian mass including a pre-menarchal girl of 9 years of age. Most of the patients with endometriomas were young patients between 25 years to 35 years of age & were picked up with endometriomas on imaging as part of infertility work up be it primary or secondary. Majority patients were treated with laparoscopy & underwent unilateral or bilateral ovarian cystectomy depending on the presentation. Only 4 patients with grade IV Endometriosis underwent total abdominal hysterectomy & bilateral salpingo-oophorectomy. Remaining 18 cases were treated with minimally invasive surgery & underwent conservative surgeries in the form of laparoscopic cystectomy in view of future fertility requirement as shown in Table 2. Three cases of ovarian torsion were managed conservatively with laparoscopic detorsion & fixation of

the ovary. Two cases of broad ligament fibroid were managed with TLH+B/L salpingectomy. There were 4 cases of infective ovarian masses (Tubercular) managed with ATT.

Two patients had chronic ectopic which were managed with laparoscopy.

Thirty five patients were found to have benign ovarian tumors in our study. Most of these benign masses were of epithelial origin. Serous cyst adenoma was the most common benign tumor seen in 18 patients. There were 7 cases of mucinous cyst adenoma in our study. Ten patients had mature cystic teratoma in our study as shown in Table 3. Majority of these patients were managed by minimally invasive surgery barring few cases treated with laparotomy in view of large size & doubtful status of the mass. All these cases underwent intra-op frozen section & surgery was done accordingly.

Thirty four patients had malignant ovarian masses in our study as shown in Table 4. Most of these malignant masses were of epithelial origin. Most common epithelial tumor was serous cyst adenocarcinoma present in 22 patients. Five patients had mucinous cyst adenocarcinoma of ovary. Five patients had sex cord stromal tumor in our study. Three patients had fibroma, 2 had granulosa cell tumor & 1 patient had the coma. Two young patients had germ cell tumor of the ovary. One patient had dysgerminoma & one patient had immature teratoma. Eighteen patients with epithelial tumors had advanced disease at the time of admission. Out of these 18 cases with advanced disease, 16 had serous cyst adenocarcinoma & 2 had mucinous cyst adenocarcinoma. All cases with advanced epithelial carcinoma underwent NACT followed by surgery except 2 cases of mucinous adenocarcinoma which underwent primary surgery as these are not very chemo-sensitive tumors. Two patients with advanced epithelial ovarian tumor were very young less than 30 years of age but genetic screening in these patients was negative. Nine cases of epithelial ovarian tumors were early disease at the time of admission & underwent staging laparotomy. All five cases of sex cord stromal tumors were treated primarily with surgery. One patient with sex cord tumor was diagnosed to have ovarian mass during cesarean delivery when intra-op frozen section revealed fibroma of one ovary & other ovary was healthy.

Majority of the patients with advanced ovarian malignancy were disease free after interval cyto-reduction. However, 3 patients with epithelial ovarian cancer underwent secondary cyto-reduction at our centre in view of recurrence post interval cyto-reductive surgery. One young patient with unilateral large ovarian mass with marginally raised CA125 & other tumor markers within normal limits underwent staging Laparotomy & frozen section intra-op revealed borderline serous papillary adenocarcinoma of ovary. Fertility preserving surgery in view of future fertility was done in this patient. One patient had a synchronous tumor with granulosa cell tumor in one ovary & carcinoma endometrium. Staging laparotomy done revealed both to be early disease & no adjuvant treatment was given.

Most of the pseudo-tumors were present in the reproductive age group & most of them were diagnosed to be endometriomas picked up as part of infertility work-up. However there were few cases of para-ovarian cysts & peritoneal inclusion cysts which were present in the elderly population. There was 1 case of torsion ovary present in a pre-menarchal girl of 9 years. Sixty five percent of benign tumors affected the reproductive age group with serous cyst adenoma as the most common diagnosis. However there were few cases of dermoid

Table 1: Patterns of Ovarian Masses at our centre from Jan 2018 to Jan 2020.

Type of tumor	Number	Percentage
Pseudo-tumor	40	36.6%
Benign	35	32.3%
Malignant	34	31.1%

Table 2: Patterns of Pseudo tumor of ovary & their management.

Type of Pseudo-tumor	Number	Management
Endometriomas	22	Laparoscopic cystectomy - 18 TAH+BSO - 4
Peritoneal inclusion cysts	4	Laparoscopic excision
Para-ovarian cysts	3	Laparoscopic excision
Torsion ovary	3	Laparoscopic detorsion & fixation
Broad ligament Fibroid	2	TLH+ B/L salpingectomy
Infective(Tubercular)	4	ATT
Chronic ectopic	2	Laparoscopic excision

Table 3: Patterns of Benign Tumors of ovary & their management.

Type of Benign tumor	Number	Management
Serous cyst adenoma	18	Laparoscopy-12 Laparotomy-6
Mucinous cyst adenoma	7	Laparoscopy3 Laparotomy-4
Mature cystic teratoma	10	Laparoscopy-8 Laparotomy-2

Table 4: Patterns of Malignant Ovarian Masses at our centre.

Type of Tumor	Number of patients
Epithelial Tumors	27
Serous Cyst Adenocarcinoma	22
Mucinous Cyst Adenocarcinoma	5
Germ Cell Tumors	2
Dysgerminoma	1
Immature Teratoma	1
Sex Cord Stromal Tumor	5
Fibroma	2
Granulosa Cell Tumor	2
Thecoma	1

Table 5: Age-wise distribution of ovarian masses.

Age group of Patients	Pseudo-tumor	Benign Tumor	Malignant Tumor	Total
09-19 years	1	2	1	4
20-29years	17	11	3	31
30-39 years	13	13	4	30
40 -49 years	3	4	7	14
50-59 years	4	4	10	18
60-69years	2	1	9	12

cysts & mucinous cyst adenoma seen in elderly population. 80% of the patients with malignant masses were in the peri-menopausal to post-menopausal age group with serous cyst adenocarcinoma as the most common variety.

Nearly 30% cases of ovarian masses were in the postmenopausal age group. Fifty percent of patients with malignant ovarian masses had post-menopausal status. Majority of the patients with pseudo-tumors & benign tumors of ovary were in the younger pre-menopausal age group as shown in Table 6.

Majority of the patients with ovarian masses presented with abdominal pain and mass per abdomen. Abdominal distension was most common presentation of advanced malignant ovarian masses with disseminated disease. Infertility was one of the common presentations in young patients with endometriomas.

Discussion

Cancers are one of the most common dreadful diseases with significant morbidity and mortality affecting the life of women. Gynecological cancers have shown an upsurge in recent times &

are an important health issue now. Because of lack of awareness & screening facilities among the masses in our country, patients usually report at an advanced stages of disease. All this has a lot of bearing on the final outcome & prognosis of the disease. Ovarian cancer is emerging as the leader of gynecological cancers in India in the recent past. In the present study, there were 109 patients with ovarian masses. Out of total 109 ovarian masses, 36.7% were pseudo tumors & 63.3% were neoplastic masses. Out of total 63.3% neoplastic masses, 32.12% were benign neoplasm & 31.19% were malignant neoplasm. Ovarian neoplasm's (both benign & malignant) have almost twice the incidence of Pseudo tumors. Mean age of malignant tumors is 48 years in our study. These figures are in concurrence with the studies done by Mondal et al. [5] and Wasim et al. [6] who reported the mean age of malignancy as 48 years and 49.5 years respectively. The proximity of the mean age of malignancy with mean age of benign ovarian tumors (39 years) warrants thorough evaluation in all the age groups to rule out malignancy. The mean age for pseudo tumors in our study is 35 years. Most common age group affected with ovarian masses is 21 years to 40 years which is comparable with Ameena et al. [7] study. According to the European statistics the age-specific incidence rates starts rising from 40 years to 44 years of age & peaks around 70's among women. The number of cases is highest among women in their 50's and 60's, accounting for almost one third of the diagnosis [8]. Thus, the increasing trend of ovarian neoplasm in younger age group in our population is noted. There was no co relation between sterilization status and ovarian neoplasm in our study. Previously, tubal ligation was thought to be protective factor in ovarian malignancies but the latest hypothesis has brought out that tubal ligation is protective against clear cell and endometrioid ovarian cancers only as they originate from the endometrium whereas the origin of Serous tumors is from the fimbria end of the fallopian tube and mucinous and brenner tumors arise from walthard cell nests with no protection from tubal ligation [9,10]. Due to absence of clear cell and endometrioid cancers in our study, no correlation could be established between tubal ligation and specific histological type of ovarian cancer. Infertility is a significant risk factor for ovarian masses in young in our study but majority turned out to be pseudo tumors in the form of endometriomas. Patients treated with ovulation induction drugs for infertility usually presented with pseudo/benign ovarian tumors in this study. However, stronger correlation exists between fertility drugs usage and Borderline Ovarian Tumors (BCT) as per the meta-analysis [11]. Among the ovarian neoplasm, 68.81% were pseudo tumors& benign masses combined and 31.19% were malignant. These findings are comparable with Mondal et al. [5] and Ameen et al. [7] study. Abdominal discomfort was the most common

Table 6: Menopausal status of patients with ovarian masses.

Menopausal status	Pseudo Tumor	Benign Tumor	Malignant Tumor	Total
Pre-menopausal	34	30	15	79
Post-menopausal	06	05	19	30

Table 7: Clinical presentation of various ovarian masses.

Symptoms	Pseudo-Tumor	Benign Tumor	Malignant Tumor	Total
Pain abdomen	20	18	10	48
Mass abdomen	12	10	14	36
Infertility	12	2	0	14
Abdominal distension	0	7	19	26
Menorrhagia	8	8	3	19
Postmenopausal bleeding	0	0	2	2

presentation in pseudo/benign masses whereas most malignant lesions presented as abdominal distension & mass lesion. Among the benign tumors, serous cyst adenoma was the most common (51.4%) followed by mature cystic teratoma (28.57%) & mucinous cyst adenoma (20%) [5,12-14].

Ethnic variations do exist among ovarian tumors. Teratomas are the most common benign ovarian masses in Malays & Chinese as per the study done by Thanikasalam et al. [12].

Whereas Indian ranks first in the incidence of serous tumors. There is a rising trend in the incidence of mucinous cyst adenomas in our study. This is matching the results of South Indian study done by Manivasakan et al. [14]. This is a significant trend as histological evidences suggest sequential progression of mucinous epithelial ovarian cancers from benign through borderline tumor to invasive cancer. So the potential preventability of borderline and invasive mucinous ovarian cancer can be done by timely surgical excision of identifiable precursor lesions, of the malignant tumors, epithelial ovarian tumors were the most common in our study. Serous cyst adenocarcinoma was the most common epithelial ovarian tumor accounting for 64.7% of cases followed by 14.7% cases of mucinous cyst adenocarcinoma. These figures show a rising incidence of epithelial tumors in our study compared to the study done by Jha et al. [13]. Among these epithelial tumors there were 3 patients who were less than 25 years of age showing a new trend of younger age involvement in epithelial ovarian cancers. Asymptomatic nature & vague abdominal complaints are the main reason for the late presentation of epithelial ovarian cancers adding to their mortality and morbidity. Fifty three percent of epithelial tumors in our study presented with advanced stage of disease. Pseudo tumors of the ovary constituted a major bulk of ovarian masses in our study accounting for 36.6% of total ovarian masses. Among these pseudo tumors, endometriomas were the most common entity accounting for 55% of total pseudo tumors. Majority of these patients were picked up during work up for infertility. Besides these para-ovarian cysts, broad ligament fibroids & peritoneal inclusion cysts constituted the rest of the pseudo tumors.

Limitation of the study

The main limitation of this study is that it is a single-center retrospective study. Multi-centric studies with large numbers are needed to validate our results.

Conclusion

Most of the ovarian masses in our study were either pseudo-tumors/benign masses. So one has to be meticulous in history taking, clinical examination followed by appropriate tumor markers & imaging & calculating ROMA/RMI to have a fair idea about the nature of mass & plan treatment accordingly. Rising incidence of epithelial tumors in young is a worrisome concern. So all age groups should be thoroughly evaluated to rule out malignancy especially in younger age group. Rising incidence of mucinous cyst adenoma & its sequential progression to carcinoma should be borne in mind & dealt accordingly. Ovarian cancers are gradually becoming the leaders of female genital cancers even in India but one must keep in mind that all ovarian masses are not malignant. One needs to have a meticulous approach in dealing with these patients.

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