Clinical Profile of Neoplastic and Non-Neoplastic Lesions of Ovary: A Prospective Observational Study from Central Indian population

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Abstract
Background: Most Indian population-based cancer registries have reported a gradual rise in the ovarian cancer incidence over the years. These neoplasms exhibit a spectrum of genetic background, much more varied than any other gynecological condition and present a big challenge to a gynecological oncologist. Therefore, proper recognition and classification of such pelvic masses is important for appropriate therapy and better prognosis.
Objectives This study aimed to look at the demographics and clinical profile of various ovarian lesions in the local population of the central India.
Patients and Methods: A prospective observational study was carried out on the surgically resected ovarian samples that were referred to the Pathology department over two and half year. A total of 100 ovarian cases were included. Relevant clinical information regarding age, bleeding, pain in abdomen, menstrual history, histopathological examination reports were recorded.
Results: Out of 100 cases of ovarian lesions, majority were neoplastic lesions. Most of the cases of non-neoplastic ovarian lesions belonged to 31-40 years' age group, whereas most cases of neoplastic ovarian lesions belonged to 41-50 years' age group. Most common presenting symptom was abnormal uterine bleeding in non-neoplastic cases. But neoplastic cases presented mainly with abdominal pain.
Conclusion: Majority of the ovarian lesions in central India population present after second parity, are benign in nature and present with abnormal uterine bleeding, whereas malignant ovarian lesions mainly present with abdominal pain and after 40 years of age.
Keywords: Ovarian Neoplasms; India; Abdomen; Parity; Oncologists.

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Introduction

Ovary is an important female reproductive organ. It consists of totipotent gametocytes and multipotent mesenchymal tissue. So almost any type of tumor can arise from ovary (**Sikdar et al.,1981**). Ovarian carcinoma stands out as the third most prevalent cancer in Indian women and eighth in the world, contributing to 3.44% of all cancer cases (**GLOBOCAN, 2008**). It is also an important cause of cancer deaths in Indian women, constituting about 3.34% of all cancer deaths in India. If diagnosed early in Stage I, the five-year survival from ovarian cancer is good (about 94%) but unfortunately only 15% of cases are diagnosed in this Stage I. While most (about 62%) of cases are diagnosed in Stages III and IV, when five-year survival is merely 28% (**Misra et al., 1991**). Ovarian cancers in advanced stage have worst prognosis, having the highest case mortality ratio amongst all gynecological cancers globally (**ICMR, 2019**).

. Most Indian population-based cancer registries have reported a gradual rise in the ovarian cancer incidence over the years. They have reported that age-adjusted incidence of ovarian cancer varies from 0.9 – 8.4 per 100,000 women (**Murthy et al.,2009).** There is age related increase in the incidence of ovarian cancer. The ASIR (age specific incidence rate) starts increasing from 35 years of age and peaks between 55-64 years of age. However, many western countries have documented a decreasing trend of incidence and mortality. This could be due to wider increase in preventive measures like use of oral contraceptives, reduction in post-menopausal HRT (hormone replacement therapy) and increased application of risk-reduction surgeries (**ICMR, 2019**).

It is a well-known fact that neoplastic conditions of ovaries are a complicated and interesting subject in the history of oncology. These neoplasms inherit a spectrum of genetic background, much more varied than any other gynecological condition (**Misra et al., 1991**), and present a big challenge to a gynecological oncologist. Even, certain non-neoplastic ovarian lesions frequently present with a pelvic mass and mimic an ovarian tumor. Therefore, proper recognition and classification of such pelvic masses is important for appropriate therapy and better prognosis. This study aimed to look at the demographics and clinical profile of various ovarian lesions in the local population of the central India.

Patients and methods

This research study was conducted after getting approval from the institutional ethics committee of L.N. Medical College & Research Centre, Kolar Road, Bhopal, Madhya Pradesh. A prospective observational study was carried out on the surgically resected ovarian samples that were referred to the Pathology department of L.N. Medical College & Research Centre over two and half year starting from May 2019.

All resected samples with diagnosis of ovarian lesion of all age groups were included, while autolyzed specimens were excluded from study. A non-probability convenient sampling technique was used and a total of 100 ovarian cases were included. Relevant clinical information regarding age, bleeding, pain in abdomen, menstrual history, histopathological examination reports were recorded.

Statistical analysis

Data analysis was performed with the help of Microsoft Excel 20087 and SPSS version 20 software. Frequency distribution and cross tabulation were used to make tables. All the qualitative data were expressed as number and percentage.

p value < 0.05 was taken to be statistically significant.

Results

Out of 100 cases of ovarian lesions studied, majority (n=64) were neoplastic lesions. Amongst the neoplastic lesions majority (n=58) were found to be benign in nature (**Table. 1**).

Table 1.Distribution of ovarian cases

Lesion Type		Number of cases	%
Non-Neoplastic		36	36
Neoplastic	Benign	58	58
	Malignant	6	6
Total		**100**	**100**

Most (44%) of the cases of non-neoplastic ovarian lesions belonged to 31-40 years' age group (**Table. 2**), whereas

most (36%) of the cases of neoplastic ovarian lesions belonged to 41-50 years' age group (**Table. 3**).

Table 2. Age wise distribution of Non-Neoplastic ovarian cases

Age	Number of cases	%
< 30	3	8.33
31-40	16	44.44
41-50	13	36.11
51-60	3	8.33
> 60	1	2.77
Total	**36**	**100**

Table 3. Age wise distribution of Neoplastic ovarian cases

Age	Benign		Malignant		Total	
	N	%	N	%	N	%
< 20	2	3.45	1	16.67	3	4.69
21-30	13	22.41	2	33.33	15	23.44
31-40	17	29.31	1	16.67	18	28.13
41-50	22	37.93	1	16.67	23	35.94
51-60	3	5.17	0	0	3	4.69
> 60	1	1.72	1	16.67	2	3.13
Total	**58**	**100**	**6**	**100**	**64**	**100**

Majority of the non-neoplastic as well as neoplastic cases presented with second parity (**Table. 4** and **Table.5**).

Table 4. Parity distribution of Non-Neoplastic ovarian cases

Parity	N	%
Nulliparous	0	0
P1L1	3	8.33
P2L2	20	55.56
P3L3	12	33.33
P4L4	1	2.78
Total	**36**	**100**

Table 5. Parity distribution of Neoplastic ovarian cases

Parity	Benign		Malignant		Total	
	N	%	N	%	N	%
Nulliparous	7	12.07	2	33.33	9	14.06
P1L1	6	10.34	1	16.67	7	10.94
P2L2	26	44.83	2	33.33	28	43.75
P3L3	10	17.24	1	16.67	11	17.19
P4L4	6	10.34	0	0	6	9.38
Unmarried	3	5.17	0	0	3	4.69
Total	**58**	**100**	**6**	**100**	**64**	**100**

Most common presenting symptom was abnormal uterine bleeding (42%) in non-neoplastic cases followed by abdominal pain (22%). But neoplastic cases presented mainly with abdominal pain (36%), and lump in abdomen being the second most common (27%) presenting symptom (**Table. 6 and Table. 7**).

Table 6. Clinical presentation of Non-Neoplastic ovarian cases

Clinical presentation	N	%
Asymptomatic	7	19.44
Abdominal mass	3	8.33
Abdominal pain	8	22.22
Abnormal Uterine Bleeding	15	41.67
Abdominal mass with adenomyosis	2	5.56
Abdominal mass with fibroid	1	2.78
Total	**36**	**100**

Table 7. Clinical presentation of Neoplastic ovarian cases

Clinical presentation	Benign		Malignant		Total	
	N	%	N	%	N	%
Abdominal mass (LA)	13	22.41	4	66.67	17	26.56
Abdominal pain (AP)	22	37.93	1	16.67	23	35.94
Abnormal Uterine Bleeding	15	25.86	0	0	15	23.44
Ascites	4	6.90	0	0	4	6.25
Asymptomatic	1	1.72	0	0	1	1.56
LA, PA & Urinary complaints	0	0	1	16.67	1	1.56
LA, PA with Ascites	3	5.17	0	0	3	4.69
Total	**58**	**100**	**6**	**100**	**64**	**100**

Discussion

Ovarian neoplasms are a challenging problem in recent days' gynecology, mainly due to variable, and many a times undifferentiated, pathologic subtypes. Its mortality rate exceeds the combined mortality of both endometrium and cervical malignancy. We studied the clinical spectrum and associated findings that is of huge clinical significance for pathologists, radiologists, and gynecologists for a good knowledge and better prognosis of the disease and

planning   proper   management   **(Gadducci et al.,2019).**

Name of Authors	Non-neoplastic	Neoplastic	
		Benign	**Malignant**
Kanthikar (2014)	51.72% (n=75)	42.75% (n=62)	5.51% (n=8)
Tejani et al. (2020)	32.1% (n=122)	60% (n=240)	7.9% (n=18)
Priya et al. (2017).	--	78% (n=97)	21% (n=16)
Prakash et al. (2017)	44% (n=110)	45.8% (n=100)	9.2% (n=19)
Laul et al. (2020)	27% (n=27)	60.8% (n=59)	11.2% (n=11)
Gaikwad et al. (2020)	54.6% (n=101)	45.4 % (n = 84)	
Present study	36% (n=36)	58% (n=58)	6% (n=6)

The above table shows the different types of the study performed all over India different parts and expresses the incidence of ovarian neoplasm in all the areas. In our study, we found out, in a total of 100 cases the non-neoplastic cases (36%) are less than the total of neoplastic cases 64 (64%) including both benign and malignant cases. Similar, the finding was seen with **Laul et al. (2020)** with 27% of non-neoplastic cases and a total of 73% cases were of neoplastic origin. similar distribution was seen in the study of **Prakash et al. (2017)** and **Kanthikar (2014)**

Ovarian tumors are common in all age groups and no age is excluded. The age range in the present study was 9 to 65 years. The maximum number of cases included in our study were in the age group of 41-50 years.

Age in years	Tejani et al. (2020)	Prakash et al. (2017)	Pradhan et al. (2018)	Mondal et al. (2011)	Present study (n=100)
<20	3.16%	5.7.%	8.3%	6.8%	4.69%
21-30	21.84%	6.2%	18.3%	30.04%	23.44%
31-40	30.26%	47.2%	25%	27.6%	28.13%
41-50	33.95%	20.12%	29.1%	22.6%	35.39%
51-60	8.42%	15.88%	15%	10.1%	4.69%
>60	2.37%	4%	4.1%	2.1%	3.13%

The above table shows comparison of various ovarian tumors according to age with other studies. The most common age group in the present study was 41-50 (35.39%) followed by 31-40 years (30.26%) with the mean age in our study being 36.43 years. This highlights that ovarian neoplasms were more prevalent in those living in the second to fifth decade of their life. Similar study done by **Tejani et al. (2020), Pradhan et al. (2018)** reveal that the maximum age group of presentation was 41-50 year. However, discordant results were reported by **Prakash et al. (2017)**, which revealed ovarian neoplasms in 31-40 years (47.2%) of age because maximum cases of germ cell tumor reported commonly in middle age group.

Increasing parity is associated with a reduction in the risk of ovarian cancer, but it is not clear whether this association applies to all the histopathological types and borderline tumors. nulliparity and unmarried females were associated with the increased relative risk of ovarian tumors (**Priya et al.,2017).**

Parity	Kanthikar (2014), (n=70)	Pradhan et al. (2018), (n=230)	Present Study (n=100)
Nulliparous	20% (n=14)	14.16% (n=34)	14.06% (n=9)
P1L1	8.57% (n=6)	17.50% (n=42)	13.94% (n=7)
P2L2	27.14% (n=19)	27.50 % (n=66)	43.75% (n=28)
P3L3	17.14% (n=12)	20 % (n=48)	17.19% (n=11)
P4L4	20% (n=14)	13.6 % (n=32)	9.38 % (n=6)
Unmarried	7.14% (n=5)	3.46 % (n=8)	8.69 % (n=3)

The above table shows comparison of various studies showing parity status in various neoplastic tumor. In our study it is found that ovarian neoplastic lesion are more in number with women having two issues or parity status two 43.75%, followed by cases of women having gravida three 17.09% (n=11). However, while considering the malignant lesion, status of parity is not very clear because of paucity of cases. The status of parity in our study for malignancy cases were maximum in women having gravida two which include two cases 33.3%, one case was presented who as nulliparus. Similar results were seen in study of **Kanthikar (2014)** and **Pradhan et al. (2018)** that women having issue two and three are minimally having the risk of development of ovarian neoplasm.

Some of the ovarian tumors may be incidentally diagnosed on ultrasound whereas others may be symptomatic. The present study reveals that the presentation of ovarian tumors is variable. If a patient presented with more than one complaint, then the predominant symptom was considered as the presenting symptom. In the present study, the most common clinical presentation among the patients with benign lesions was abdominal pain 22(37.93%) followed by abnormal uterine bleeding 15(25.86%) and abdominal mass 13(22.41%). There were 4 (6.90%) patients presented with benign lesions who had ascites and two case 5.17% had a abdominal mass with pain in the abdomen with ascites. Only one patient was asymptomatic. Out of 6 patients with malignant lesions, mostly patient present with abdominal mass (66.67%) followed by 16.67% abdominal pain and lump, rest presented with pain with urinary complaints.

Symptoms	Kanthikar (2014)	Tejani et al. (2020)	Priya et al. (2017)	Present Study
Asymptomatic	10.67%	6%	12%	1.56%
Abdominal mass	10.67%	13%	11%	26.56%
Abdominal pain	29.33%	27%	57%	35.94%

Abnormal Uterine Bleeding	36%	18%	22%	23.44%
Ascites	8%	3%	3%	6.25%
Abdominal mass with other complaints	16.6%	9%	8%	6.25%

The above table shows comparison of mode of presentation of Neoplastic lesions of ovary with other studies. However, **Kanthikar (2014)** study report of 70 cases of neoplastic neoplasm, the most common presentation was abnormal uterine bleeding or vaginal bleeding with 36% cases followed by pain in the abdomen 29.33% of cases the total of 7.1 % of malignant cases are presented with a lump in the abdomen this discordance seen because majority of patient presented with complex feature of cyst. **Tejani et al. (2020)** stated that out of 301 cases maximum number of women presented with Pain in the abdomen around 27% of cases followed by 18% of women presented with abnormal uterine bleeding with asymptomatic women were 18 cases in number (6%) (**Tejani et al. ,2020).** Margaret H Priya et al80 in this study most of the patients with ovarian mass, almost 57% presented with abdominal pain and 12% were asymptomatic. Abdomen pain, bleeding per vaginum on and off were also the most common symptoms **Priya et al. (2017).**

Conclusions

Clinical presentation of ovarian lesions varies in central India population with majority presenting after second parity. They are benign in nature and present with abnormal uterine bleeding, whereas malignant ovarian lesions mainly present with abdominal pain and after 40 years of age.

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