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Original Article

Retrospective histopathological study of germ cell tumors of ovary at a tertiary care centre of western Rajasthan

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Abstract:

Introduction: Ovarian tumors are second most common tumors of female genital tract. OGCT (Ovarian Germ Cell Tumors) are a type of ovarian neoplasm principally affecting young women. Ovarian germ cell neoplasms constitute the second largest group accounting for 15 to 20 percent of all ovarian neoplasms. In children and adolescents, more than 60% of ovarian neoplasms are of germ cell origin and one-third is malignant. Diverse histopathology is seen in ovarian tumors which reflect the different cell of origin of these tumors. Determining the various histologic patterns in ovarian tumors is important not only for diagnosis but also for the prognosis. Present study was planned with the aim of finding out the incidence of different types of germ cell tumors.

Objectives: (1) To study frequency and distribution of different histological types of ovarian germ cell tumors (2) To analyze age distribution of these tumors and to find out frequency of benign and malignant germ cell neoplasms of ovary (3) To analyze associated clinical symptoms in different types of germ cell tumors.

Material and Methods: The present study was a hospital based record review and was carried out for the duration of seven years from Jan 2010 to 2018 in the department of Pathology, S.P. Medical College and associated group of Hospitals, Bikaner. A semi-structured pre-tested questionnaire was used for collection of information. Data were analysed using Epi info software and T-Test and ANOVA (Analysis of Variance) was used to compare the mean age of presentation of different histopathological types of germ cell tumors of the ovary.

Results: A total of 124 cases were analyzed and the Mean age for study population was 31.61 years with 13.09 of standard deviation. Abdominal swelling was the predominant symptom and present among all the patients of ovarian germ cell tumors. Teratoma was commonest histopathological variant of ovarian germ cell tumor. Immature teratoma was the commonest histopathological variant of malignant ovarian germ cell tumor. There was a difference in the mean age of presentation of different histopathological types of ovarian germ cell tumors. Strauma ovarii tend to present in later age while Yolk Sac Tumor, Dysgerminoma, Teratoma tend to present at an early age.

Conclusion: Teratoma was the most common histopathological variant of ovarian germ cell tumor and main symptoms of ovarian germ cell tumors were abdominal swelling and pain.

Keywords: OGCT, Histopathology, Teratoma

Introduction:

Ovarian tumors are the second most common tumors of female genital tract[1] comprising 30% of cancers of female genital tract and 6% of all cancers in female.[2] Ovarian cancer is 6th most common cancer among women worldwide[3] and 3rd leading cancer site in Indian population.[4] In India, the ovarian cancer incidence (age-adjusted rate per 100,000) in different population based cancer registries is reported to range from 1.7 to 15.2 for the year 2012 to 2014.[5] Ovarian germ cell tumors (OGCT) are a type of ovarian neoplasm principally affecting young women. They are derived from primitive germ cells of the embryonic gonads and may undergo germinomatous or embryonic differentiation. They differ in clinical presentation, histology and biology and include both benign (predominantly) and malignant subtypes. Ovarian germ cell neoplasms constitute the second largest group accounting for 15-20% of all ovarian neoplasms.[6] 95% of germ cell tumors are dermoid cysts and most of the reminder are malignant.[7] In children and adolescents, more than 60% of ovarian neoplasms are of germ cell origin and one third are malignant.[8] The incidence of malignant ovarian germ cell tumors range from 1 to 6 percent as reported in the West[9,10] and from 8 to 19% in Asia.[11] The poor survival is due to the fact that they do not clinically manifest early and approximately 60-70% of the neoplasm present as either stage III or stage IV.[12] Diverse histopathology is seen in ovarian tumors which reflects the different cell of origin of these tumors. Determining the various histologic patterns in ovarian tumors is important not only for diagnosis but also for the prognosis. The prognosis can be predicted from the degree of differentiation of these tumors.[13] Present study was planned to find out the incidence of different histologic types of Ovarian germ cell tumors. .

Objectives: (1) To study frequency and distribution of different histological types of ovarian germ cell tumors (2) To analyze age distribution of these tumors and to find out frequency of benign and malignant germ cell neoplasms of ovary (3) To analyze associated clinical symptoms in different types of germ cell tumors.

Materials and Method:

The present study was a hospital based record review and was carried out for the duration of seven years from Jan 2010 to 2018 in the department of Pathology, S.P. Medical College and associated group of Hospitals, Bikaner. All the specimens of ovary received in the department of Pathology during the study period were included in the study and Germ cell tumors other than ovary**,** ovarian tumors other than Germ cell Tumors and autolysed and necrotic specimens were excluded from the study. A semi-structured pre-tested questionnaire was used for collection of information. Questionnaire consisted of socio-demographic profiles like age, registration number, address and religion, history about menstruation and reproductive life, clinical findings and gross and microscopic finding of the tumor. Information including age, clinical presentation, related history, involvement (whether unilateral or bilateral) was obtained from the histopathological requisition forms of the patients. Histopathological reports of all the cases were recorded from the data base. Data were analysed using Epi info software and T- Test and ANOVA (Analysis of Variance) was used to compare the mean age of presentation of different histopathological types of germ cell tumors of the ovary.

Results:

Table 1 shows the distribution of epidemiological characteristics of study population. Mean age for study population was 31.61 years with 13.09 of standard deviation.

Table 1: Epidemiological distribution of study population:

Age groups (Years)(n=124)	**Frequency**	**Percentage**
≤18	13	10.48%
19-30	57	45.97%
31-40	29	23.39%
41-50	17	13.71%
≥51	8	6.45%
Religion (n=124)		
Hindu	112	90.32%
Muslim	10	8.06%
Sikh	2	1.61%
Residential area (n=124)		
Rural	63	50.81%
Urban	61	49.19%
Family History (n=124)		
Yes	0	0.0%
No	124	100%
Consistency (n=124)		
Cystic	2	1.61%
Solid	2	1.61%
Both (Cystic + Solid)	120	96.77%
Benign/Malignant (n=124)		
Benign	105	84.68%
Malignant	19	15.32%
Metastasis (n=19)		
Yes	11	57.89%
No	8	42.11%

Table 2 shows the distribution of study population according to symptoms of germ cell tumors of ovary. Abdominal swelling was the predominant symptom and present among all the patients of ovarian germ cell tumors.

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Table 2: Distribution of study population according to Symptoms of Germ Cell Tumors

Symptoms	Frequency	Percentage
Abdominal pain	118	95.16%
Abdominal swelling	124	100%
Menstrual Irregularities	45	36.29%
Urinary Urgency	54	43.55%

Table 3 shows the distribution Histopathological types of germ cell tumors of ovary. Teratoma was commonest histopathological variant of ovarian germ cell tumor.

Table 3: Distribution of different Histopathological types of Germ Cell tumors among study population

Types of Germ Cell Tumors	Frequency	Percentage
Teratoma		
Immature	8	6.45%
Mature	103	83.06%
Dysgerminoma	6	4.84%
Strauma Ovarii	2	1.61%
Yolk Sac Tumor	4	3.23%
Mixed germ cell tumors	1	0.81%
Total	124	100%

Table 4 shows the histopathological variant of malignant ovarian germ cell tumor. Immature teratoma was the commonest histopathological variant of malignant ovarian germ cell tumor.

Table 4: Histopathological variants of malignant ovarian germ cell tumors (n=19)

Histopathological type	Frequency	Percentage
Immature Teratoma	8	42.10%
Dysgerminoma	6	31.58%
Yolk Sac Tumor	4	21.06%
Mixed germ cell tumors	1	5.26%
Total	19	100%

Table 5: Age distribution of different Histopathological types of germ cell tumors

Types of Germ cell tumors	Mean Age of Presentation±SD	ANOVA & p value
Teratoma (n=111)	31.9±12.74	F=3.24, p=0.025*
Dysgerminoma (n=6)	25.8±11.39	
Strauma Ovarii (n=2)	54.0±19.79	
Yolk Sac Tumor (n=4)	22.0±12.80	
Mixed germ cell tumors (n=1)	22	

Table 5 shows the comparison of mean age of presentation of different histopathological types of germ cell tumors of the ovary. The mean age of presentation of mixed germ cell tumor was not included because only one case was available. ANOVA (Analysis of Variance) test was used to compare the mean age of presentation of different types of ovarian germ cell tumors. The F value was 3.24 and p value was 0.025. This p value was statistically significant; which means there was a difference in the mean age of presentation of different histopathological types of ovarian germ cell tumors. Strauma ovarii tend to present in later age while Yolk Sac Tumor, Dysgerminoma, Teratoma tend to present at an early age.

Table 6: Age distribution of Teratoma

Types of Teratoma	Mean Age of Presentation±SD	t-test value & p value
Mature Teratoma (n=103)	31.8±12.70	t=0.319, p=0.750 (NS)
Immature Teratoma (n=8)	33.3±14.16	

NS- Not significant

Table 6 shows the comparison of mean age of presentation of different histopathological types of teratoma of the ovary. The t-test was used to compare the mean age of presentation of mature and immature teratoma. The t value was 0.319 and p value was 0.750. The p value was statistically not significant; which means there was no difference in the mean age of presentation of different types of teratoma.

Figure 1 shows that abdominal swelling was predominant symptom and was present among all the histopathological types of germ cell tumors. Followed by abdominal pain which was present among all the cases of Dysgerminoma, Strauma Ovarii, Yolk Sac tumor and Mixed germ cell tumor.

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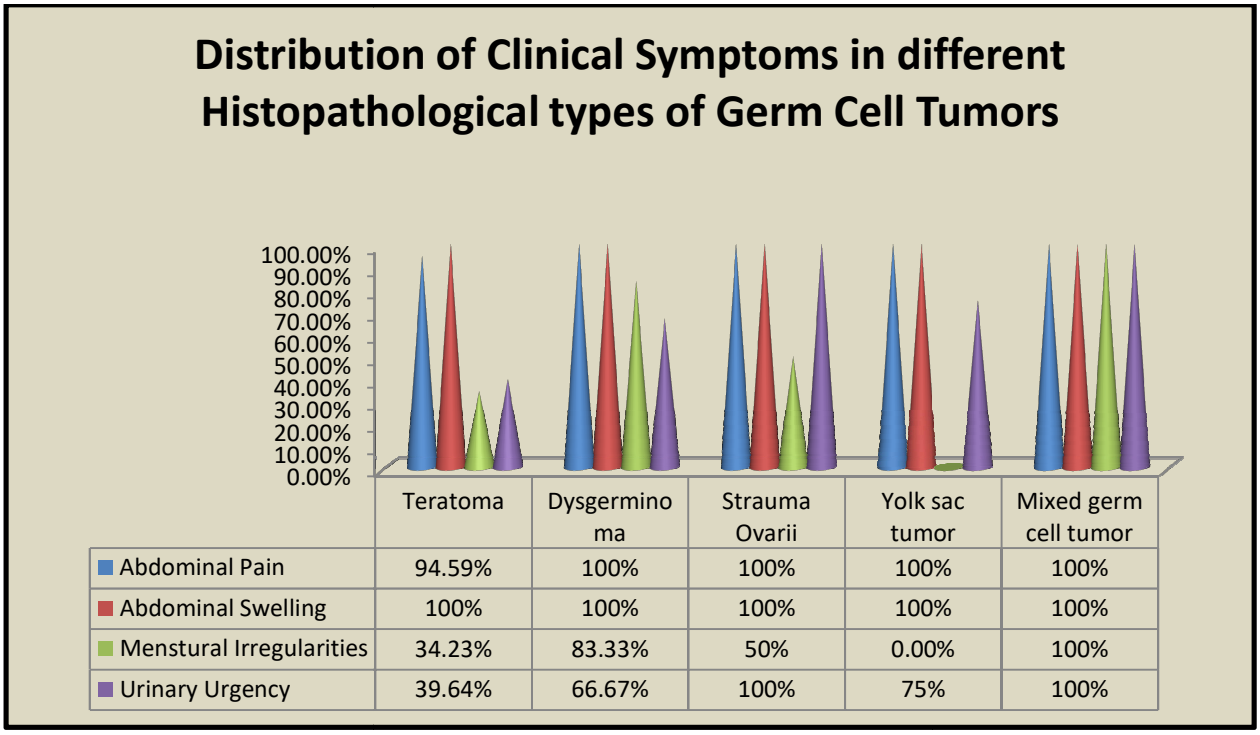
Fig.1: Distribution of Clinical Symptoms in different Histopathological types of Germ Cell Tumors



	Teratoma	Dysgerminoma	Strauma Ovarii	Yolk sac tumor	Mixed germ cell tumor
Abdominal Pain	94.59%	100%	100%	100%	100%
Abdominal Swelling	100%	100%	100%	100%	100%
Menstural Irregularities	34.23%	83.33%	50%	0.00%	100%
Urinary Urgency	39.64%	66.67%	100%	75%	100%

Discussion:

In present study the maximum patients of ovarian germ cell tumors were between 19 to 30 years of age group. Similar results were found by Norris HJ and Jensen RD as well as by Jha R and Karki S in their studies.[8,14] This finding shows that ovarian germ cell tumors presents at younger age. So the clinicians must keep in mind the ovarian germ cell tumor in case of pain abdomen in young age female. In present study no variation in occurrence of ovarian germ cell tumors were found regarding residential area. One study by Annalisa Trama and Franco Berrino shows that germ cell cancer incidence varies considerably in different geographical areas.[15] More studies need to be planned in India to look for any geographical variation in occurrence of ovarian germ cell tumors. In present study no positive family history for germ cell tumors of ovary was found. This finding suggests that ovarian germ cell tumors don't run in families. A study by Stettner et al found that Familial ovarian germ cell tumors are rare.[16]

The findings of present study and the references cited[17,18,19,20] regarding clinical symptoms showed that the main symptoms of ovarian germ cell tumors were abdominal swelling, and pain and the cause was mass effect due to large size of tumors.

In present study the commonest histopathological variant was mature teratoma followed by that was immature teratoma and dysgerminoma. Yolk sac tumors, Strauma ovarii and mixed germ cell tumors were of rare types. Similarly findings were obtained by many authors.[14,21,22,23,24]. Contrary to that Nnadi D et al found dysgerminoma as the commonest ovarian germ cell tumors.[25]This contrary finding may be due to small sample size used in that study. In present study the mean age of presentation of different types of ovarian germ cell tumors was compared

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and found that teratomas, dysgerminomas and yolk sac tumors presened at an early age and while Strauma Ovarii presented at a later age. Similarly A.H. Walker et al. found that the rates for teratomas have an earlier age peak by about 10 years than do the rates for dysgerminomas.[26]

The present study showed that the metastasis was present among more than half of the malignant cases. This high rate of metastasis at the time of diagnosis indicates that the malignant ovarian germ cell tumors are silently spreading and clinicians must keep this in mind while dealing a patient of germ cell tumors of ovary.

Conclusion:

Teratoma was the most common histopathological variant of ovarian germ cell tumor and main symptoms of ovarian germ cell tumors were abdominal swelling and pain. Ovarian germ cell tumors presents at younger age. High rate of metastasis at the time of diagnosis indicates that the malignant ovarian germ cell tumors are silently spreading and clinicians must keep this in mind while dealing a patient of germ cell tumors of ovary.

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