A Study of Incidence of Ovarian Tumors in Oophorectomy Cases with Special Emphasis on Tribal Population of Jharkhand

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Abstract: _Background_: _Tumors of the ovary are common form of neoplasia seen in females. Ovarian tumors comprise 6% of all cancers in female. It ranks fifth among female tumors. Among female genital tract cancers it ranks third after cervical cancer and endometrial cancer. Though the incidence of ovarian cancer is less, it account for almost half of deaths from cancer of female genital tract. Almost half of ovarian tumors are benign and occurs between age 20-45 years. Malignant tumors are more common in older women between 45 and 60 years. Early diagnosis of ovarian tumor is difficult since it presents with pelvic heaviness, abdominal swelling, abdominal pain, abnormal uterine bleeding in advanced stages, early diagnosis rests on suspicion and accidental radiological findings. Hence more work is required the highlight the problems with early diagnosis of ovarian tumors, particularly in low socio-economic groups. Events of reproductive life, high parity, early age of mother at birth of the baby, use of oral contraceptives and breast feeding are known to reduce the incidence of ovarian malignancy. Family history of ovarian or breast cancer, use of fertility drugs such as Clomiphene citrate, use of talcum powder on genital areas and poor genital area hygiene are high risk factors. All such cases need to get proper attention so early diagnosis should be tried to reduce mortality._ _Objectives_: _To know the incidence of ovarian tumors especially in reference to tribal population of Jharkhand. 2) To observe various risk factors associated with ovarian tumors. 3) To study the various histopathological forms of ovarian tumors._ _Material and methods_: _Biopsy specimen for the present study were comprised of specimen of different patients received in the Department of Pathology from Department of Obstetrics & Gynaecology, Department of Surgery of Rajendra Institute of Medical Sciences, Ranchi, Jharkhand during 2018-2019. Each specimen was studied following taking proper history, age, parity, marital status, socioeconomic status and presenting symptoms. The specimen were examined grossly followed by microscopic examination after proper processing and staining. Statistical analysis was done by using Pearson Chi-square test and the p-value was found to be less than 0.05 which was statistically significant._ _Results_: _Based on the 2500 Gynecological admissions in departments of Obstetrics & Gynecology and Surgery, and total 150 oophorectomy samples received during November 2017 to October 2019, incidence of ovarian tumors was 1.2% of all gynecological admissions. Majority of cases had follicular cysts, hence it was regarded as normal physiological finding in the Ovary. The incidence of malignant tumor was 4% of all oophorectomy cases. Benign ovarian tumor was 16%.The incidence of Dermoid cyst was 30% with almost 1/3rd (10%), showing malignant changes. The incidence of sex-cord tumor was 10% while germ cell tumor was 40%. 60% cases of ovarian tumors occurred in tribal population of Jharkhand which was almost similar to those found in non-tribal population._ _Conclusion_: _In tribal population of Jharkhand, the most common tumor are surface epithelial cell tumor followed by dermoid cyst. The tumor is more common in nullipara and women with low fertility. The most common age group was 20-40 years. The overall propensity for ovarian tumors in tribal population of Jharkhand are similar to that of general population._

Keywords: Ovarian tumor, Oophorectomy, Tribal population, Dermoid cyst, Surface epithelial tumor

1. Introduction

Tumors of ovary are common form of neoplasia in women. Ovarian tumors comprises 6% of all cancers in females ranking 5th among all tumors. Among female genital tract tumors it ranks third after cervical and endometrial cancers.

Though the incidence of ovarian cancer is less, it accounts for almost half of deaths resulting from cancer of female genital tract. Almost 80% of ovarian tumors are benign and occurs between age 45 and 65 years.

A simplified classification of ovarian tumor proposed by WHO is accepted with minor modifications. Five major groups are described:
1) Tumors of surface epithelium
2) Germ cell tumors
3) Sex-cord stromal tumors
4) Miscellaneous tumors
5) Metastatic

Germ cell tumor has one group known as teratomas in which mature cystic teratomas are known as dermoid cyst.

Teratomas are tumors comprising of more than single cell type derived from more than one germ layer.

Dermoid cyst are tumors containing practically any type of tissue arranged orderly with well-differentiated ectodermal and mesodermal tissue surrounding an ectodermal component. Dermoid cyst constitute most common ovarian tumor of childhood and adolescence. They are unilateral in 88% of cases and usually provoke only symptoms related to mass. Occasionally they are accompanied with hemolytic anemia or virilization.

Early diagnosis of ovarian tumors is difficult. The early diagnosis rest highly on suspicion. Hence more work is required to highlight the problems with early diagnosis of ovarian tumors.

Events of reproductive life, high parity, early age of mother at birth of the baby, use of oral contraceptives and breast-feeding are known to reduce the incidence of ovarian malignancy.

Family history of ovarian cancer, use of fertility drugs, use of talcum powder in genital areas or napkins and also women who have breast cancer are all at higher risk.

Period of study: 24 months

Study area: Department of Pathology of a tertiary care center where samples were processed, along with departments of

Surgery and Obstetrics & Gynecology of the same center for obtaining various data and clinical history.

Sample size:- study was carried out on 150 samples of oophorectomy specimen obtained in department of pathology for histological examination among 2500 patients admitted in departments of Surgery and Obstetrics & Gynecology presenting with gynecological complaints.

2. Observation

Table 1: Showing incidence of ovarian tumors

Total number of gynecological admission	Total number of ovarian tumors	Percentage
2500	30	1.2

The incidence of ovarian tumors is 1.2% of total cases admitted with gynecological complaints.

**Table 2:** Incidence of all lesions in oophorectomy cases

Lesion	Number of cases	Percentage
Normal	24	16
Follicular cyst	63	42
Luteal cyst	9	6
Endometriosis	6	4
Simple cyst	18	12
Tumors	30	20
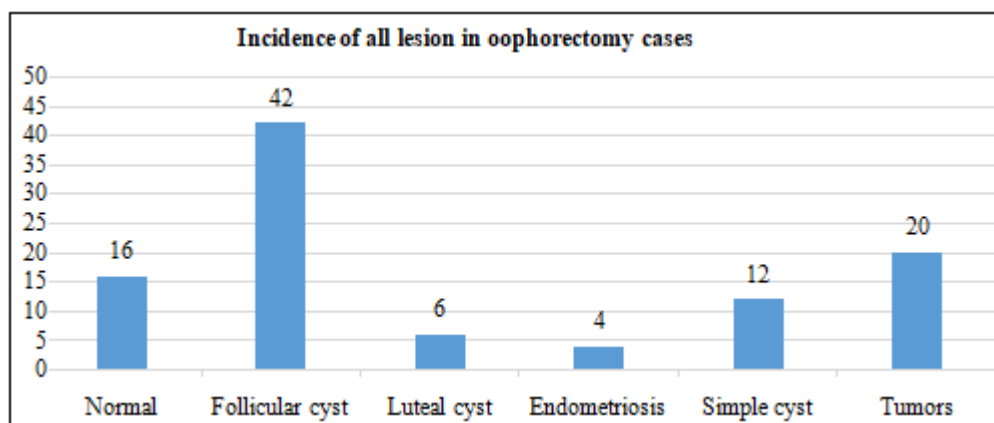
20% of all oophorectomy cases were ovarian tumor. The most common lesion was follicular cyst comprising 42% of ovarian lesions.

**Table 3:** Ratio of benign versus malignant ovarian tumors

Tumor	Number of cases	Percentage
Malignant	6	20
Benign	24	80
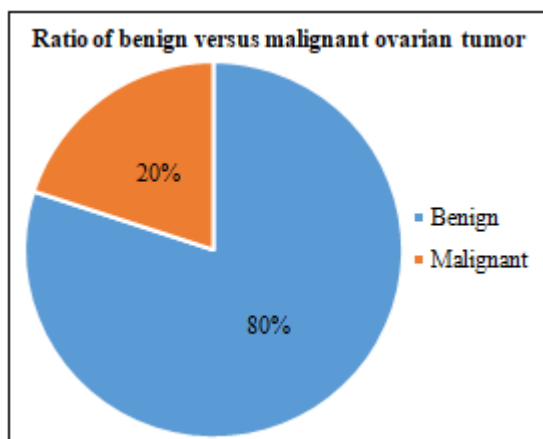
20% of ovarian tumors were malignant while 80% were benign.

Table 4: Showing histopathological diagnosis cases and their incidence

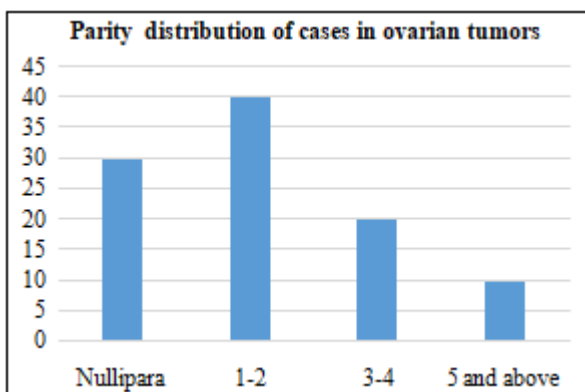| Tumor type	No. of cases	Percentage
Serous cystadenoma	9	30
Mucinous cystadenoma	6	20
Dermoid cyst	6	20
Dermoid cyst with malignant change	3	10
Dysgerminoma (malignant)	3	10
Granulosa cell tumor	3	10
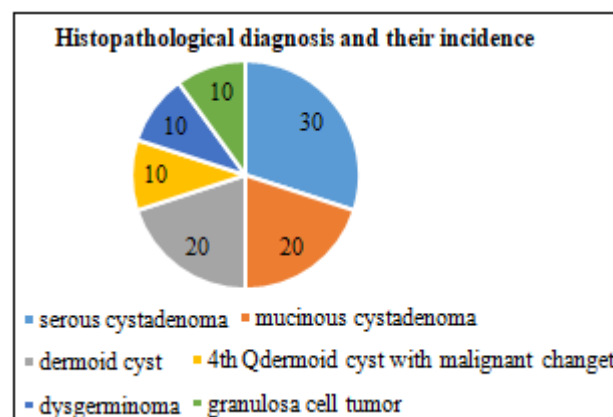
The above table shows incidence of surface epithelial tumors to be 50% (30% serous Cystadenoma and 20% Mucinous cysadenoma). the incidence of germ cell tumors were 40% (20% Dermoid cyst, 10% Dermoid cyst with malignant changes and 10% Dysgerminoma) among all ovarian tumors.

Incidence of Sex cord tumors were 10%. It comprised of Granulosa cell tumor.

**Table 5:** Showing parity distribution of cases in ovarian tumors

Parity	No. of cases	Percentage
Nullipara	9	30
1-2	12	40
3-4	6	20
5 and above	3	10

Parity distribution of cases in ovarian tumors

30% cases were nullipara and all were having germ cell tumor. 40% cases were para 1 to 2.

Table 6: Parity distribution in dermoid cyst

Parity	No. of cases	Percentage
Nullipara	6	66
1-2	3	34

Parity distribution in dermoid cyst
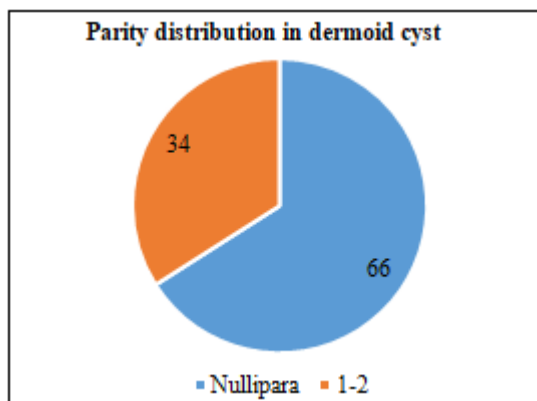
66% cases were nullipara.

Table 7: Age distribution of ovarian tumor

Age (years)	No. of cases	Percentage
10-20	6	20
21-40	15	50
41 and above	9	30

Age distribution of ovarian tumors
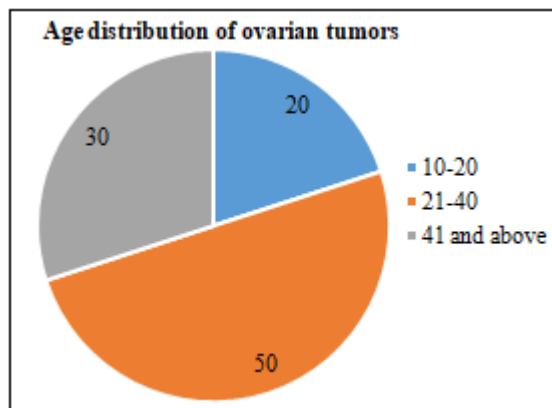
Table 8: Age distribution of dermoid cyst

Age (years)	No. of cases	Percentage
10-20	3	34
21-40	6	66

Ovarian tumors were more common in 20-40 years of age. In dermoid cyst, benign variety had 50% incidence below 20 years, 25% in 21-40 years which had malignant changes.

Table 9: Incidence of presenting symptoms

| Presenting symptom	No. of cases	Percentage
Abdominal mass	18	60
Vaginal bleeding	9	30
Ascites	3	10

60% cases of ovarian tumors presented with abdominal mass.

**Table 10:** Incidence of ovarian tumors in tribal population to others

Type of population	No. of cases	Percentage
Tribal	18	60
Non-tribal	12	40

Table 11: Incidence of various ovarian tumors in tribal population

| Type of tumor	No. of cases	Percentage
Surface epithelial tumor	12	66
Dysgerminoma	3	17
Dermoid cyst	3	17

Incidence of ovarian tumor in tribal population
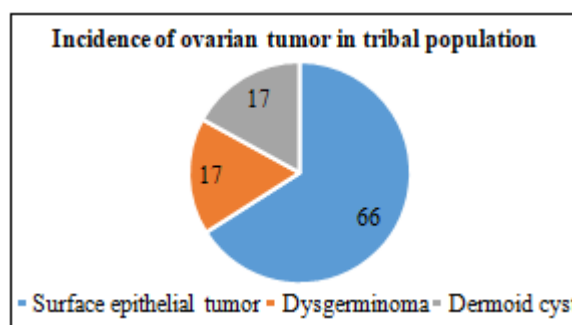
Surface epithelial tumors were common tumor in tribal populatioin constituting about 66%, while the incidence of dermoid cyst and dysgerminoma was found to be 17% each.
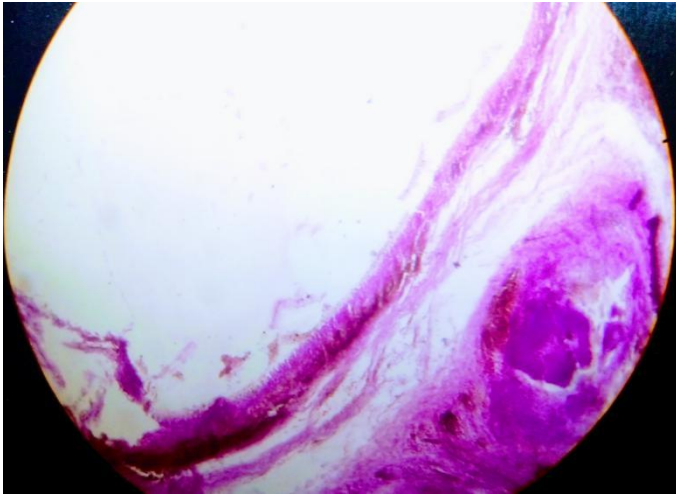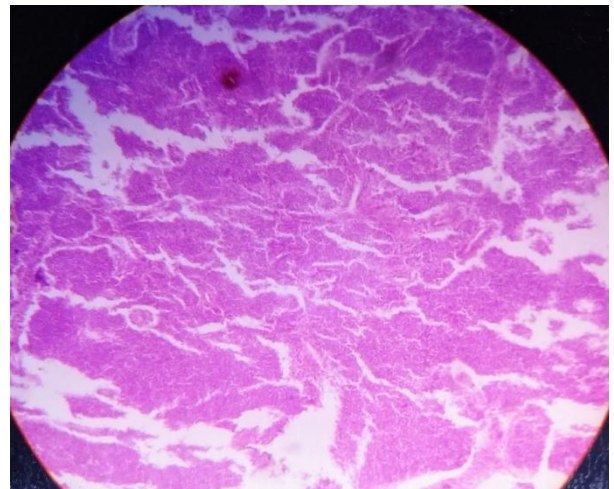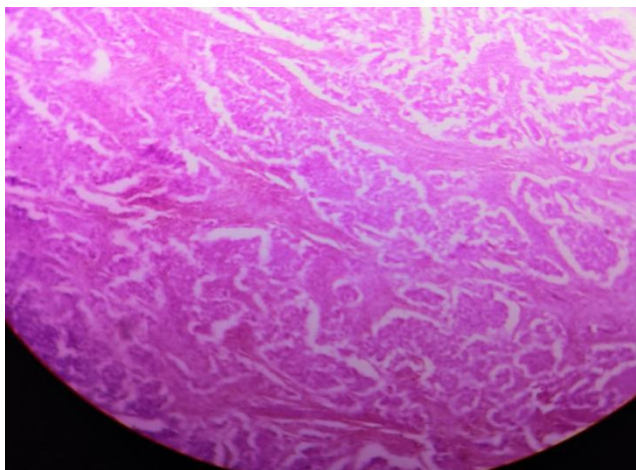
Follicular cyst 10x10, H&E
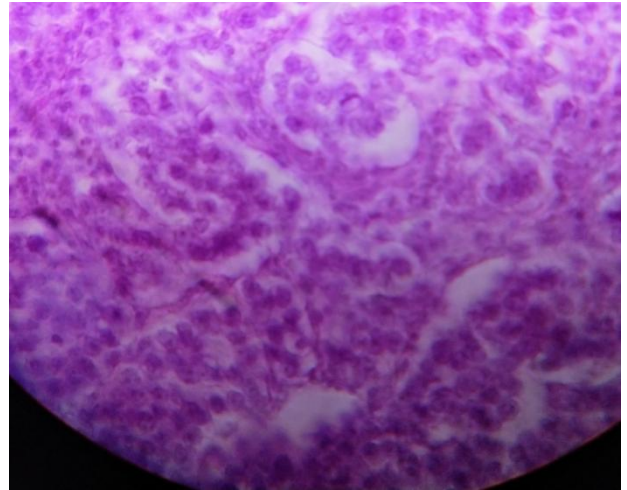
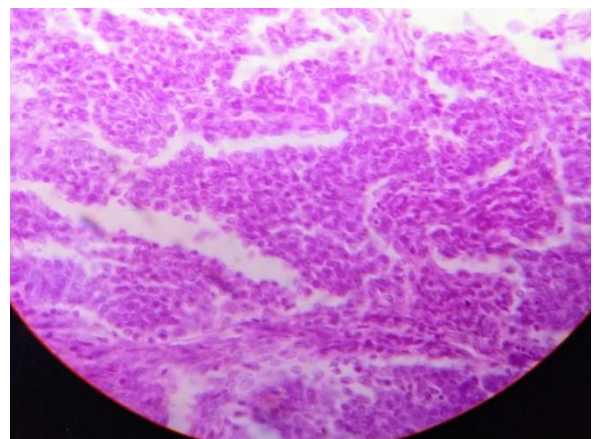

Dysgerminoma 10x40, H&E
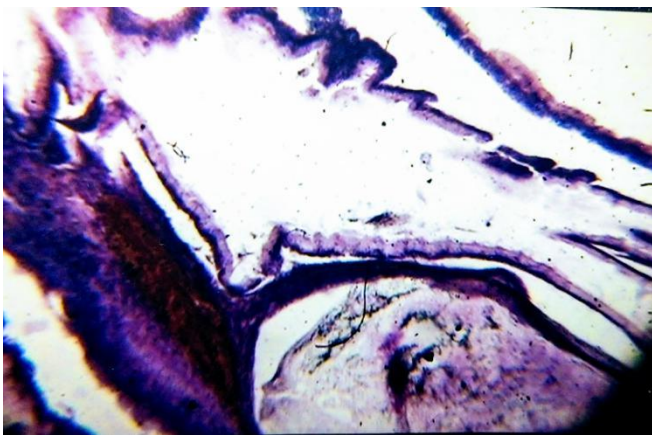
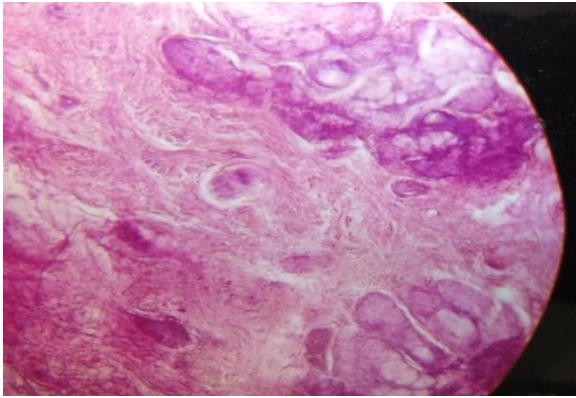Mucinous cystadenoma 10x10, H&E
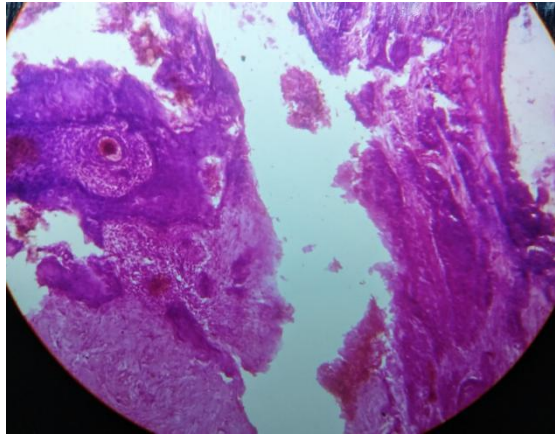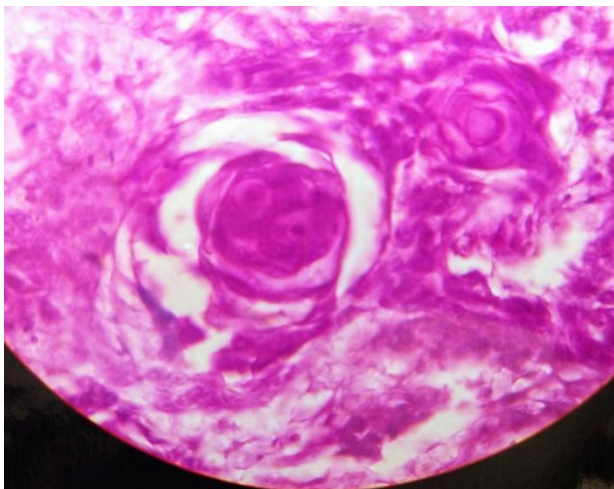

Granulosa cell tumor 10x10, H&E

Dysgerminoma 10x10, H&E

Granulosa cell tumor 10x40, H&E

Dermoid cyst 10x10 H&E

Dermoid cyst with squamous cell carcinoma
10x10, H&E

Dermoid cyst with squamous cell carcinoma
10x40, H&E

3. Discussion

Ovarian tumor is a major tumor of female genital tract. Incidence of uterine and cervical cancer is higher, but ovarian cancer account for 52% of all gynecological deaths. It is because 75% of ovarian cancer is not diagnosed until cancer is advanced to stage III or IV. Ovarian cancer is a silent killer, however recent improvement in identification of ovarian tumor increased likelihood of early detection.

In India, 13.91% of ovarian tumors occurred in girls below 20 years and 35.7% of them were malignant. 80% of malignant tumor was of germ cell variety. Among this age, 57% was of germ cell variety (Obstet Gynecol Ind Vol. 53, Kundu Sharmila et al). This study is nearly similar to our study, which shows 20% of cases occur below 20 years. Incidence of malignant tumor was 50% in it and that too was of Dysgerminoma.

Total number of cases admitted in hospital between November 2017 to October 2019 were 2500. among these cases, incidence of ovarian tumor was 1.2% (Table-1).

Purandare (1956) in his series of study found ovarian tumors in 1.3% cases of all gynecological admissions. This study correlates with the present study.

Among the oophorectomy cases, 20% constitute ovarian tumors of which 80% were benign and 20% were malignant (Table-2 and Table-3), which correlates with the studies made by Dicker R.C et al (1982), Vercellin P et al (1999), Vora et al (1969) who found the incidence of malignant cases in 16 to 20% of ovarian tumors.

Serous tumors account for 25% cases and mucinous tumor 10 to 20% of cases.

Germ cell tumor are the most common tumors in children and adolescent accounting for 60-70% of all ovarian tumors in this age group whereas mature cystic teratoma, dermoid cyst predominate the proportion of malignant germ cell tumor. Tumors of surface epithelium represent only 15-20% of ovarian tumor in this group.

Dysgerminoma constitute less than 1% of all ovarian tumors and 5% of all malignant one. Sex cord stromal tumors comprises 5% of all ovarian neoplasms (Rosai and Ackerman).

In present study, the incidence of surface epithelial tumors is 50% (30% serous cystadenoma and 20% mucinous cystadenoma). the incidence of germ cell tumpor is 40% (20% dermoid cyst, 10% dermoid cyst with squamous cell carcinoma and 10% dysgerminoma). incidence of sex cord tumor was 10% (Table-4). This study correlates with Sternberg's Diagnostic Surgical Pathology, 5th edition, which shows surface epithelial tumors above 60% with serous tumor predominantly. 20% of surface epithelial tumors show malignant changes in the age group above 50 yrs. Germ cell tumor account for 30% of all ovarian tumors. 95% of germ cell tumors were dermoid cyst. In our study, we found 75% dermoid cyst. The frequency of malignant germ cell tumor is higher in blacks, which was found to be 50% in our study.

Dermoid cyst account for 25% of ovarian tumors. In our study, it is 30% and accounts for 2/3rd of all ovarian tumors younger than 20 years. Only 2% of dermoid cyst undergo malignant change, most common is squamous cell carcinoma.

The risk of ovarian cancer is increased in nulliparous women and women with low parity (Runnebaem and Stickeler, 2001). in our study, 30%cases occurred in nullipara and 40% in low parity i.e. 1-2 (Table-5).

In our study, incidence of tumors is more common in age group 20-40 years. Even in dermoid cyst 66% cases occurred in 20-40 years age group. Germ cell tumor is more common in younger age group with 50% cases younger than 20 years (Table-6). sex cord tumors seen in 20-40 years. This findings correlates with Lee Jones L (2003).

The principle symptoms of ovarian tumors are increased in abdominal girth, palpable intra-abdominal mass and menstrual irregularity. This finding correlates with other other observations shown in table 9.

In our study (Table-10), 60% cases of ovarian tumors occurred in tribal population. Among them 66% were surface epithelial tumors. Incidence of germ-cell tumors were 34% (17% dermoid cyst and 17% dysgerminoma).

Cystic teratoma makes up 15-25% of ovarian neoplasm. They occur in active reproductive period. Malignant transformation is seen in 2% of cases usually in older women and that is mostly squamous cell carcinoma. This also correlate with our findings.

One in 70 women will develop ovarian cancer. This respected 1.7% life time risk. The majority of ovarian cancer cases occur between the ages 55 and 74 years. Dermoid cyst has lowest malignant potential of 2%. 75% of patients present with increased abdominal girth and ascites.

4. Summary and Conclusion

Oophorectomy is a common operation done in perimenopousal and postmenopousal women. The present study is based on naked eye examination and histopathological examination of 150 specimen of ovary received in the Department of Pathology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India.

The following conclusions were drawn from the study:-
- Incidence of ovarian tumor was 1.2% of all gynecological admissions.
- Majority of cases had follicular cyst in ovaries, hence it should be regarded as normal physiological finding in the ovary.
- The incidence of malignant ovarian tumor was 4% of all oophorectomy cases. Benign ovarian tumor was 16%. The ratio of benign to malignant tumor in this study was 80:20.
- The incidence of dermoid cyst was 30% (20% dermoid cyst and 10% was dermoid cyst with malignant changes).
- The incidence of sex cord tumor was 10%.
- The incidence of germ cell tumor was 40%.
- Dermoid cyst was present in all ages but malignant change in dermoid cyst was seen in 40-60 years age group.
- Ovarian tumor incidence was maximum in 20-40 years age group.
- Majority of cases occurred in nulliparous and women with low parity of 1 to 2.
- Dysgerminoma was present in less than 20 years of age and is presented with metastasis.
- Predominat presentation in ovarian tumor and dermoid cyst was abdominal swelling followed by abnormal vaginal bleeding.

- Surface epithelial tumor being most common tumor with serous cystadenoma being the predominant form followed by germ cell tumor and sex cord tumor.
- In germ cell tumor, dermoid cyst was more common.
- 60% of cases of ovarian tumor occurred in tribal population of Jharkhand.
- In tribal population most common was surface epithelial tumor followed by dermoid cyst.
- In tribal population, tumor was more common in nullipara and women with low parity, and was more common in 20-40 years age group.
- Findings in tribal population were similar to findings in normal population except the incidence of surface epithelial tumors which was more compared to that found in normal population.

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