e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(1); 1378-1384

Original Research Article

# Study of Clinicopathological Correlation of Ovarian Tumours in P.M.C.H, Patna

**Shiksha[1], Ankita[2], Krishna Murari Prasad[3]**

[1]Junior Resident, Department of Pathology, Patna Medical College and Hospital, Patna, Bihar
[2]Junior Resident, Department of Pathology, Patna Medical College and Hospital, Patna, Bihar
[3]Professor, Department of Pathology, Patna Medical College and Hospital, Patna, Bihar

**Received: 25-10-2023 / Revised: 23-11-2023 / Accepted: 26-12-2023**
**Corresponding Author: Dr. Ankita**
**Conflict of interest: Nil**

**Abstract:**

**Background:** Ovarian tumours are a common form of neoplasm in women. The complex anatomy of ovary and its peculiar physiology and the constant cyclical changes from puberty to menopause gives rise to a number of cell types each of which is capable of giving rise to tumours. Ovarian cancer is the 5th leading cause of death among women in the world and accounts for 3% of all cancers in female. Despite the new techniques in imaging and genetics, the diagnosis of ovarian tumours is primarily dependent upon histopathological examination.

**Methods:** All surgically removed ovarian specimens from oophorectomy, laparotomy, or total abdominal hysterectomy with adnexa that were sent to the PMCH, Patna, and Department of Pathology for histopathological investigation were included in the current study. A thorough history was kept, together with microscopic and gross features.

**Results:** Age distribution of ovarian tumors was found to be somewhat variable, with 51.72% of cases occurring in the 21–40 year age range. Of the 82 occurrences (74.54%) of parity with more than one, there were 28 (25.45%) with parity one or less than one. After noting the menstrual status of the study participants, it was discovered that 70.90% of them were in the premenopausal age group, which was more prevalent than the postmenopausal age group. The specimens collected were from two procedures: (1) ovarian cystectomy (26 cases, 23.6%), which was followed by (1) total abdominal hysterectomy with unilateral or bilateral adnexa combined (64 cases, 58.18%).Additionally, three specimens for oophorectomy and salpingo-oophorectomy, representing eight (7.2%) and four (12.9%) instances, respectively, were received. Of the 110 ovarian tumor patients, 14 had appendicitis connected with them, 8 had uterine vaginal prolapse linked with them, and 5 had calculus cholecystitis associated with them.

**Conclusion:** Treatment, follow-up, and prognosis for ovarian tumors can all benefit from the current study findings. To deploy preventative measures in communities with higher risk, it also analyses risk factors.

**Keywords:** Ovarian Tumors, Clinico-Pathological Correlation, Ovary, World Health Organization classification.



## Introduction

Ovarian tumours are the common form of neoplasia in women. About 80% are benign lesions and occur in young women between the age group of 20-45 yrs and malignant tumours are more in 45-65 yrs [1].The complex anatomy of ovary and its peculiar physiology and the constant cyclical changes from puberty to menopause gives rise to a number of cell types each of which is capable of giving rise to tumours. [2] This morphological diversity of ovarian tumours poses many challenges in diagnosis for both gynaecologists and pathologists.

The ovary is a striking exception to the Virchow's dictum that organs which are frequently the site of primary cancer are rarely involved in secondary malignancy, and vice versa. Both primary and secondary carcinomas of the ovary are relatively frequent and show an astounding variety of pathologic patterns. [3]

Among cancers of the female, ovary is the third most common site of primary malignancy after cervix and breast in Indian females. Ovarian cancer is the 5th leading cause of death among the women in the world and accounts for 3% of all cancer in female. [4] The age adjusted rates of ovarian cancer vary from 5.4 to 8 per 100000 populations in different parts of the country. [5] Most of ovarian cancers have spread beyond the ovary by the time of diagnosis and they account for a disproportionate number of deaths from cancer of the female genital tract.6The overall survival rate is

approximately 35% at 5 years, 28% at 10 years and 15% at 25 years. [7]

Ovarian neoplasms should be separated from the wide spectrum of non-neoplastic lesions which frequently form a pelvic mass and are often associated with abnormal hormonal manifestations, thus potentially mimicking ovarian neoplasms.

Finally clinical data, operative findings and gross features of the lesions may provide important diagnostic clues. Despite the new techniques in imaging and genetics, the diagnosis of ovarian tumours is primarily dependent upon histopathological examination. [8]

The present study is undertaken to study the incidence, epidemiology, age distribution and classify objectives according to clinicopathologic correlation of ovarian tumours in our institution and thus offering a specific diagnosis which is of paramount clinical significance.

**Aims and Objective**

- To study the distribution of ovarian tumours with respect to various parameters like age, clinical presentation, parity, menstrual status, laterality, size, gross features and consistency of the tumours.
- To correlate clinical findings with histopathological diagnosis.
- To study the incidence of different histopathological subtypes of ovarian tumours.
- To study the incidence of malignancy, both primary and secondary.
- To study the gross morphological patterns of the various Histopathological tumours types.

**Materials and Methods**

**Source of Data:** All the patients who attended the OPD and IPD of Patna Medical College and Hospital, Patna from Nov 2017 to Nov 2019 were considered for the study.

**Method of Collection of Data:** The present study included all surgically resected ovarian specimen of oophorectomy or laparotomy or total abdominal hysterectomy specimen with adnexa, sent for Histopathological examination to the Department of Pathology, PMCH, and Patna. A detailed history, gross and microscopic feature were recorded according to following Proforma:

**Demographic Details:**

- Name
- Age

**Identification Details:**

- IP No
- HPE No.

**Mode of Presentation:**

- Abdominal pain
- Mass per abdomen
- Menstrual complaints
- Ascites
- Infertility
- Others

**Past History**

**Family History**

**Menstrual History**

**Parity**

**Gross Details:**

- Laterality- Unilateral/Bilateral
- Size in centimetres
- External surface
- Cut surface- Cystic / solid / Complex
- Contents of the cyst- Serous / Mucinous / Pultaceous
- Other relevant details

**Microscopic Details**:

**Histopathological Diagnosis:**

The gross specimens received were fixed overnight in 10 percent formalin. The gross examination was carried out and adequate representative sections were taken according to the guidelines by Rosai and Ackerman Surgical Pathology with special emphasis on solid foci, areas adjacent to the ovarian surface and from papillary projections. Sections were processed for one day and later embedded in paraffin which were cut at five micron thickness. Sections were stained with conventional Haematoxylin and Eosin (H&E) stain. W.H.O. classification of ovarian tumours was used for classifying ovarian tumours.

**Type of Study:** Descriptive study

**Inclusion Criteria:**

- All the Ovarian tumours, irrespective of their clinical features, stage of disease or type of surgical procedure implemented were included.
- Hysterectomy specimens with incidental ovarian tumours were also included.

**Exclusion Criteria:**

Non-neoplastic ovarian lesions like simple ovarian cyst, tubo-ovarian mass and polycystic ovaries were excluded.

**Observation and Results**

The present study on ovarian tumours was done from Nov 2017 to Nov 2019 in the Department of Pathology, Patna medical college and Hospital, Patna. A total number of 110 cases of ovarian tumours were studied. Clinical features, gross and microscopic features were recorded in a structured

Proforma. The details were transcribed into a master chart and were analysed.

A wide variation of age was noted among ovarian tumours, majority of the cases were seen in age group of 21-40 years i.e., 51.72%.

There were 28 (25.45%) cases of parity one or less than one and 82 (74.54%) cases of parity with more than one. Menstrual status of the patients in the study were noted and found that Premenopausal age group was more common than postmenopausal, contributing to 70.90%. Specimens received were of (1) Total abdominal hysterectomy with unilateral or bilateral adnexa together (64 cases, 58.18%) followed by (2) ovarian cystectomy (26cases: 23.6%). Also received were (3) oophorectomy and salpingo-oophorectomy specimens with 8(7.2%) and (4) 12(10.9%) cases respectively. Out of 110 cases of ovarian tumours, 14 were associated with appendicitis, 08 were associated with utero vaginal prolapse and 05 cases were associated with calculus cholecystitis.

**Table 1: Histomorphological Classification of Ovarian Tumours According to the Cell of Origin as Per Whom Classification:**

| Cell Of Origin | No. Of Cases | Percentage |
|---|---|---|
| Surface Epithelial Tumour | 74 | 67.27% |
| Germ Cell Tumour | 29 | 26.36% |
| Sex Cord Stromal Tumour | 6 | 05.45% |
| Metastatic Tumour | 1 | 0.9% |
| Total | 110 | 100% |

Most common tumour of the ovary encountered in this study was benign serous cystadenoma of ovary 28 cases (25.45%)followed by mature cystic teratoma 25 cases(22.72%) as shown in table 2.

**Table 2: Histological Types Of Ovarian Tumours Individual Category Wise**

| Ovarian Tumours | No. Of Cases | Percentage |
|---|---|---|
| Serous Cystadenoma | 28 | 25.45% |
| Serous Cystadenofibroma | 15 | 13.63% |
| Borderline Serous Cystadenoma | 4 | 03.63% |
| Serous Cystadenocarcinoma | 6 | 05.45% |
| Mucinous Cystadenoma | 15 | 13.63% |
| Mucinous Cystadenocarcinoma | 2 | 01.81% |
| Mixed Seromucinous Cystadenoma | 4 | 03.63% |
| Mct Without Struma Ovarii | 24 | 21.81% |
| Mct With Struma Ovarii | 1 | 0.90% |
| Dysgerminoma | 2 | 1.81% |
| Yolk Sac Tumour | 2 | 1.81% |
| Fibroma | 2 | 1.81% |
| Granulosa Cell Tumour | 4 | 03.63% |
| Metastatic Tumour | 1 | 0.90% |
| Total | 110 | 100 |

Among Ovarian tumours, almost half the cases presented with a combination of clinical symptoms consisting of abdominal pain, mass per abdomen, ascites and menstrual irregularities. The commonest presenting symptoms in ovarian tumour were pain abdomen and mass per abdomen 68 (61.81%) cases and 47 (42.72%) cases respectively. Among the Ovarian tumours studied, 94 cases had unilateral involvement. The right sided tumours (55 cases; 50.00%) were relatively more common than the left sided tumours (39cases; 35.45%) as shown in table 9 and graph 9. There were 16 cases (14.54%) which were having bilateral involvement which included serous cystadenoma, serouscystadenocarcinoma, mucinous cystadenoma and mature cystic teratoma.

**Table 3: Variation in Size of Ovarian Tumour**

| Size In Cms | Number Of Cases | Percentage |
|---|---|---|
| <=10 | 72 | 65.45% |
| 11-20 | 35 | 31.81% |
| 21-30 | 3 | 2.72% |
| Total | 110 | 100.00% |

**Table 4: Gross Features of Ovarian Tumours**

| Consistency | No. Of Cases | Percentage | Malignant Tumours | Percentage |
|---|---|---|---|---|
| Cystic | 80 | 72.72% | 6 | 7.50% |
| Solid | 4 | 3.63% | 3 | 75.00% |
| Solid & Cystic | 26 | 23.63% | 10 | 38.46% |

| | | | | |
|---|---|---|---|---|
| Total | 110 | 100% | 19 | 17.27% |

**Table 5: Distribution of Benign, Borderline And Malignant Tumours of Ovary**

| S.No | Tumours | No. Of Cases | Percentage |
|---|---|---|---|
| 1 | Benign | 87 | 79.09% |
| 2 | Borderline | 4 | 03.63% |
| 3 | Malignant | 19 | 17.27% |
| Total | | 110 | 100% |

Most benign tumours of ovary were between the age group of 21 to 40 years while the borderline tumours of ovary were between the age group 41 to 50 years and malignant tumours were between age group 51-70. Majority of benign tumours (75 out of 87 cases; 86.20%) were unilateral tumours. Out of 16 cases of bilateral tumours only 4 (21.05%) cases were malignant tumours while 12 cases were benign tumours of ovary.

**Table 6: Distribution of Benign Ovarian Tumours**

| Benign Ovarian Tumour | No. of Cases | Percentage |
|---|---|---|
| Serous Cystadenoma | 28 | 32.18% |
| Serous Cystadenofibroma | 15 | 17.24% |
| Mucinous Cystadenoma | 15 | 17.24% |
| Mixed Seromucinous Cystadenoma | 4 | 4.59% |
| Mature Cystic Teratoma With Or Without Struma Ovarii | 25 | 28.73% |
| Total | 87 | 100% |

**Table 7: Distribution of Malignant Tumours of Ovary**

| Malignant Ovarian Tumour | No. Of Cases | Percentage |
|---|---|---|
| Serous Cystadenocarcinoma | 6 | 31.57% |
| Mucinous Cystadenocarcinoma | 2 | 10.52% |
| Granulosa Cell Tumour | 4 | 21.05% |
| Dysgerminoma | 2 | 10.52% |
| Fibroma | 2 | 10.52% |
| Yolk Sac Tumour | 2 | 10.52% |
| Metastatic Tumour | 1 | 5.26% |
| Total | 19 | 100% |

**Table 8: Age Distribution of the Major Tumour Categories**

| Age In Years | Surface Epithelial Tumours | Germ Cell Tumours | Sex cord Stromal Tumours | Metastatic Tumours | Total |
|---|---|---|---|---|---|
| 11-20 | 3 | 4 | - | - | 7 |
| 21-30 | 18 | 12 | - | - | 30 |
| 31-40 | 18 | 10 | - | - | 28 |
| 41-50 | 18 | 3 | 1 | - | 22 |
| 51-60 | 9 | - | 5 | 1 | 15 |
| 61-70 | 8 | - | - | - | 8 |
| Total | 74 | 29 | 6 | 1 | 110 |

## Discussion

Because of the anatomical location, ovarian tumours may remain unnoticed for a long period of time. These tumours can cause abdominal pain and mass per abdomen. Based on histological patterns, these tumours are divided into benign, borderline and malignant. The common variants are surface epithelial tumour, germ cell tumour and sex cord stromal tumours. The ovary is one of the common sites to get metastatic deposits from other abdominal malignancies [23].

The tumours of the ovary can occur at any age even in children and in old age. In the present study maximum number of cases (52.72%) was in 2nd to 4th decade of life. Comparative analysis of age incidence is done with the studies done by Ramachandra.G et al [24]; K.verma et al [25]; Pilli.et al9which also showed a higher incidence of ovarian lesions in the 2nd to 4th decade.

Most commonly encountered tumours of ovary were the surface epithelial tumours (67.27%) followed by germ cell tumour (26.36%).the studies done by Pilli et al (2001) [9]; Gupta et al (2007) 10 and other co works also showed a higher occurrence of surface epithelial tumours followed by germ cell tumours.

Least commonly group of tumours seen in all the studies were metastatic tumours of ovary.

**Table 9: Relative Percentage of Histological Types of Ovarian Tumours Individual Category Wise Compared to Other Studies**

| Ovarian tumours (%) | K.verma et al(1979) [28] (n=262) | Tyagi.s.p et al(1967) [29] (n=120) | Ashraf et al(2012) [26] n=127 | Present study (n=110) |
|---|---|---|---|---|
| Serous cystadenoma | 23.5% | 33.34% | 15.74% | 25.45% |
| Serous cystadenofibroma | 2.5% | - | - | 13.63% |
| Borderline serous cystadenoma | - | - | - | 03.63% |
| Serous cystadenocarcinoma | 5.2% | 2.5% | 8.66% | 05.45% |
| Mucinous cystadenoma | 18.6% | 23.34% | 10.23% | 13.63% |
| Mucinous cystadenocarcinoma | 6.5% | 2.5% | 7.0% | 01.81% |
| Mixed seromucinous cystadenoma | - | - | - | 03.63% |
| MCT without strumaovarii | 17.3% | 11.67% | 24.4% | 21.81% |
| MCT with strumaovarii | | 0.83% | - | 0.90% |
| Dysgerminoma | 21.1% | - | 1.57% | 01.81% |
| Yolk sac tumour | - | - | 2.36% | 01.81% |
| Fibroma | - | - | | 01.81% |
| Granulosa cell tumour | 7.2% | 3.33% | 2.36% | 03.63% |
| Metastatic tumour | 6.5% | 0.83% | 0.78% | 0.90% |

**Table 10: Mode of Presentation of Benign and Malignan Tumours of Ovary in Various Studies In Comparison With Present Study.**

| Clinical presentation | Benign (%) | | | | Malignant (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Bhattacharya et al. (1980)[30] n=173 | Maheshwari et al (1994)[31] | Phukan et al. (2013)[32] n=28 | Present study n=87 | Bhattacharya et al. (1980)[30] n=77 | Maheshwari et al. (1994)[31] n=60 | Phukan et al (2013)[32] n=22 | Present study n=19 |
| Mass per abdomen | 57.23% | 71.4% | 42.8% | **36.63%** | 84.42% | 73.2% | 40.9% | **68.18%** |
| Pain in abdomen | 65.90% | 47.3% | 85.7% | **58.41%** | 72.73% | 47.8% | 45.4% | **72.7%** |
| Menstrual irregularities | 26.56% | 4.0% | 46.3% | **21.78%** | 6.48% | 30.9% | 59.1% | **31.81%** |
| Ascites | - | - | - | 1.14% | - | - | - | **36.84%** |
| Infertility | 13.30% | - | - | **13.86%** | - | - | - | **-** |
| Others | 10.4% | 16.18% | 14.2% | **3.96%** | 18.3% | 10.38% | 27.3% | **9.0%** |

In our study 85.45% tumours were unilateral and 14.54% were bilateral. The incidence of laterality was in concordance with the studies done by Prabhakar et al (1989) 2; Mishra. R.K et al (1990) [20]; Couto.F et al (1993) [33]; Kanthikar et al (2014) [11] which also showed a higher occurrence of unilateral tumours than bilateral tumours of ovary.

Amongst the unilateral tumours, in the present study right side (50.00%) was more commonly involved. This finding was in concordance with the study done by Tyagi. S.P et al [29] which showed a higher occurrence (42.1%) of right sided tumours, also the study done by Ramachandra et al [24] showed an almost equal occurrence of both right and left side tumours (40.06% and 38.5%respectievely). Grossly it was found in our study that most of the benign tumours of ovary were cystic (72.72%) followed by tumours which had both cystic and solid component (23.63%).

This finding was in concordance with the studies done by Mishra. R.K et al (1990) [20]; Couto.F et al (1993) [33]; Maharjan et al [35]; Panchal et al(2015) [34] which also showed a higher occurrence of purely cystic tumours followed by both cystic and solid tumours. 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 to borderline tumours. [38] Nulliparity and low parity were associated with increased relative risk of ovarian tumors in the present study. In this study, tumors in nullipara and women with low parity (upto two children) contributed to 56.35 % of all tumors which was consistent with findings of study done by Kayasthaet al. [37] in their study tumors in nullipara and women with low parity contributed to 58.93 %. Similar results were obtained in study by Adamiet al. [3]

## Conclusion

Our study of 110 ovarian tumours in PMCH, Patna, aimed to correlate clinical findings with histopathological examination and classify the ovarian tumour according to WHO classification. Surface epithelial ovarian tumours was the most common category of ovarian tumours followed by germ cell tumours, sex cord stromal tumours and metastatic tumours in decreasing order of frequency. Incidence of benign tumours was much higher than malignant

tumours with benign serous cystadenoma being the most common benign tumour and serous cystadenocarcinoma being the most common malignant tumour.

Reproductive age group showed higher incidence of ovarian tumours whereas there was increasing incidence of malignancy with increasing age group. Parity one or less than one showed higher risk of malignancy. Pain in abdomen was the most common symptom in benign as well as malignant tumours whereas ascites was more commonly seen with malignant tumors. Benign tumours showed cystic morphology and malignant tumours present with complete or solid morphology.

Thus age more than 50 years, post-menopausal age group, solid and complex tumour morphology, presence of ascites and parity one or less than one show significant increased incidence of malignancy and thus these parameters can be used to predict the risk of malignancy in ovarian tumours. The result of present study can be used in treatment, follow-up and prognosis of ovarian tumours. It also identifies risk factors so it can apply for preventive measure in community with increased risk.

## References


1. Kumar, Abbas and Aster, Robbins and cotran pathologic basis of disease, ninth edition, volume 2, chapter 22:1022-1023
2. Prabhakar BR, Kalyani M. Ovarian tumors-prevalence in Punjab. Indian J. Pathol. Microbiol 1989; 32(4): 276-281.
3. Neeraj Bathra. Anatomy. In: Arnold (eds). Jeffecots Principles of Gynaecology. London and New Delhi: 2001; 20-80.
4. Kumar, Abbas and Aster, Robbins and cotran pathologic basis of disease, ninth edition, volume 2, chapter 22:1023
5. Consolidated Report of Population Based Cancer Registries 2001-2004. National Cancer Registry Program Indian Council of Medical Research. Bangalore, 2006
6. Kumar, Abbas and Aster, Robbins and cotran pathologic basis of disease, ninth edition, volume 2, chapter 22:1023
7. Rosai J. Ovary. In: Ackerman's Surgical Pathology vol 2 (9th edition) .St Louis: Mosby; 2004:1649-1736.
8. Jagadeeshwari. N, Reddy R.S., Rao K.S. Incidence of ovarian tumors. J.Obstet. Gynec.India1971; 21: 727 -732.
9. Ganga S Pilli, K.P.Sunitha, A.V.Dhaded, V V.Yenni. Ovarian tumors a study of 282 cases. J Indian Med Associ 2002; 100(7): 420-424.
10. Gupta. N, Bisht. D. Retrospective and prospective study of ovarian tumors and tumor like lesions. Indian journal of Pathol Microbiol.2007; 50(30): 525- 527.
11. Kanthikar SN, Dravid NV, Deore PN et al. Clinicohistopathological analysis of neoplastic and non-neoplastic lesions of the ovary: A 3-year prospective study in Dhule, North Maharashtra, India. Journal of Clinical & Diagnostic Research. Vol 8, 2014 Aug: F C 04-F Co7.
12. Pachori G, Meena US, Sunaria RK, Pachori P, Jethani N, Bayla T. Histopathological study of ovarian tumors in Ajmer region. Int J Med Sci Public Health 2016;5: 1400-1403
13. Manoja V, Pramood M, Jyothi V, Chandrashekar KPA. Clinicopathological Study of Ovarian Tumors: A 2-year Study. Int J Sci Stud 2017; 5(3):300-305.
14. Narang S, Singh A, Nema S, Karode R. Spectrum of ovarian tumours- a five year study. J Pathol Nep 2017;7: 1180-3.doi: 10.3126/jpn.v7i2.18002
15. Amita S Patel, Jignasha M Patel, Kamlesh J Shah. Ovarian tumors - Incidence and histopathological spectrum in tertiary care center, Valsad. IAIM, 2018; 5(2): 84-93.
16. Standring S, Ellis H, Healy JC, Johnson D, Williams A, Collins P et al. Ovaries. In: Gray's anatomy. The anatomical basis of clinical practice, 39th edn. Edinburgh: Churchill Livingstone; 2005.p.131-26.
17. Scully RE, Young RH, Clement PB. Tumor-like lesions. In: Tumors of the ovary, maldeveloped Gonads, Fallopian tube, and Broad ligament (23 fascicle, 3rd series). Washington: AFIP; 1998.p.409-50..
18. Jaimes prat. Development, Anotomy and histology of the ovary, nonneoplastic disorders. In: Pathology of the ovary. Philadelphia: Saunders; 2004.p.1-34.
19. Young B, Female genital organs. In: Young B, Love JS, Stevens A, Heath JW, (eds). Wheater's Functional Histology. 5th ed. Churchill Livingstone: Elsevier; 2000; 263-87
20. Misra RK, Sharma SP, Gupta U, Gaur R, MisraSD . Pattern of ovarian neoplasm in eastern U.P. Journal of obstetrics and Gynaecology 1990; 41(2): 242-246.
21. Novak E.R. Gynaecological and obstetrical pathology. 6th ed. Philadelphia: Saunders; 1967.
22. Charles Zaloudek, Brenda W.N. The ovary and fallopian tube. In: Silverberg's principles and practice of surgical pathology. Steven G. Silverberg (Ed) Virginia: Churchill Livingstone; 2006; 1987-2063.
23. Wetchler SJ, Dunn LJ. Ovarian abscess. Report of a case and a review of the literature. Obset GynecolSurv 1985; 40(7):476-85.
24. Ramachandra G, Harilal KR, Chinnamma K, Thangavelu H. Ovarian neoplasms- A

study of 903 cases. J Obstet Gynecol India 1972; 22:309-315.
25. Verma K and Bhatia A. Ovarian neoplasms – A study of 403 cases. Journal of Obstet & Gynec India. 1981; 31: 110.
26. Ashraf A, ShaikhS. A, Ishfaq A,K et al.The relative frequency and histopathological pattern of ovarian masses. Biomedica: vol .28(jan-jun 2012).
27. Makwana H, Maru A, Lakum N et al. The relative frequency and histopathological patern of ovarian masses-11 year study at tertiary care centre, International journal of medical science and public health.2014;vol 3:issue 1
28. Verma K and Bhatia A. Ovarian neoplasms – A study of 403 cases. Journal of Obstet&Gynec India. 1981; 31: 110.
29. Tyagi SP, Tyagi GK, Logani KB. A pathological study of 120 cases of ovarian tumors. J ObstetGynec India. 1967; 17: 423-433.
30. Bhattacharya MM, Shinde SD, Purandare VN. A clinicopathological analysis of 270 ovarian tumors. J Postgrad Med. 1980; 26:103.
31. Maheshwari V, Tyagi SP, Saxena K, et al. Surface epithelial tumors of the ovary.Indian J Pathol Microbiol 1994; 37: 75-85.
32. Phukan. J.P, Sinha. A, Sardar. R, Guha.P. Clinicopathological analysis of ovarian tumors in perimenopausal women: A study in rural teaching hospital of eastern India. Bangladesh journal of medical science; vol 12:no.3,july 2013.
33. Couto F, Nadkarni NS, Rebello MJ .Ovarian Tumours in Goa: A clinicopathological study. Journal of Obstetrics and Gynaecology of India 1993;
34. Panchal N., Parikh U., Histopathologial pattern of ovarian tumors, International journal of scientific research. vol 4:issue 1;januar 2015.
35. Maharjan. S et al.Clinicomorphological study of ovarian lesions ,Journal of chitwan medical college.2013;3(6)
36. KarTushar, Kar Asanranthi Mohapatra PC. Intraoperative cytology of ovarian tumours, J Obstet Gynecol India 2005; 55(4): 345-349.
37. S Kayastha, Study of ovarian tumours in Nepal Medical College Teaching Hospital. Nepal Med Coll J 2009; 11(3): 200-202.