ISSN Print: 2664-7591
ISSN Online: 2664-7605
Impact Factor: RJIF 5.2
IJAN 2024; 6(1): 108-113
www.pharmaceuticaljournal.in
Received: 18-02-2024
Accepted: 25-03-2024

Hiral Pankajkumar Shah
Assistant Professor,
Department of Pathology,
Banas Medical College and
Research Institute, Palanpur,
Gujarat, India

Varshaben K Dhuliya
Assistant Professor,
Department of Pathology,
Banas Medical College and
Research Institute, Palanpur,
Gujarat, India

Jitendra Kumar S Parmar
Assistant Professor,
Department of Pathology,
NAMO MERI, Silvassa, DNH,
Dharpur, Gujarat, India

Corresponding Author:
Hiral Pankajkumar Shah
Assistant Professor,
Department of Pathology,
Banas Medical College and
Research Institute, Palanpur,
Gujarat, India

A histopathological study of ovarian lesions

Hiral Pankajkumar Shah, Varshaben K Dhuliya and Jitendra Kumar S Parmar

DOI: https://doi.org/10.33545/26647591.2024.v6.i1b.86

Abstract
Background: Tumors of the ovary, which are the third most common tumors of the female genital tract after carcinoma cervix and endometrial, can occur at any age. Patients typically present at an advanced stage, posing challenges to clinicians due to the restricted role of lab work up. A histological examination is required for a definitive diagnosis. Present study was conducted to determine the frequency of non-neoplastic and neoplastic lesions and to evaluate prognosis according to microscopic characteristics.
Materials and Methods: Present cross-sectional study conducted in 148 surgically resected ovarian specimens received at the Department of Histopathology, Banas Medical College & Research Institute, Palanpur from April 1, 2021 to December 31, 2022. The specimens were received in formalin-filled containers by the histopathology department, where they were grossed, processed, evaluated, and classified as non-neoplastic or neoplastic lesions. Relevant variables such as OCP history and lesion laterality were documented.
Results: Ovarian lesions were found to be more prevalent among women aged 31 to 50 years. In the study of 148 ovarian lesions, 98 were non-neoplastic and 50 were neoplastic. Follicular cysts were prevalent among non-neoplastic lesions, and luteal cysts were reduced. Benign lesions were prevalent among malignant lesions. Five of the six malignant tumors were grade 1 and one was grade 3.
Conclusion: Ovarian tumors were common among women using oral contraceptive pills (OCPs) or had undergone tubectomy procedures. Timely detection and surgical intervention are crucial to halt disease progression. Malignant lesions can manifest at any age and may affect one or both ovaries. Grading plays a vital role in guiding patient management and predicting survival outcomes.

Keywords: Histopathology, non-neoplastic, ovarian lesions

Introduction
The ovaries are internal reproductive organs situated adjacent to the uterus near the lateral pelvic wall. A typical ovary measures up to 5x3x3cm in size. Variations in size are attributed to endogenous hormonal fluctuations, which change with age and each menstrual cycle [1]. While ovaries are notably resilient to disease, ovarian tumors are prevalent, constituting around two-thirds of ovarian tumors diagnosed during the reproductive years. Among women aged 20 to 44, approximately 80-85% of these tumors are benign [2, 3]. The exact cause of ovarian cancers remains unclear. However, risk factors include nulliparity, heredity, and certain genetic conditions like Lynch syndrome and Peutz-Jeghers syndrome [4].
In the majority of cases, tumors do not exhibit symptoms and are only detected when they result in abdominal pain and distension. Menstrual irregularities may also occur [5]. Benign lesions can develop at any age but are more common among women of reproductive age. Conversely, malignant lesions tend to arise in women aged 50-60 during menopause and decrease thereafter [6]. In the modern age of advanced diagnostic tools, laboratory investigations have limited utility before surgery. While ultrasound (USG) can aid in delineating morphological characteristics, it cannot reliably differentiate between hydrosol [7]. Even with diagnostic laparoscopy, there is a possibility of missing an intraovarian cancer [8]. The definitive diagnosis of all ovarian cysts is achieved through histological examination [9]. Benign cysts generally carry a more favorable prognosis compared to malignant ovarian cancer. In cases of germ cell cancers, early detection often leads to a fair prognosis [10].

Current study was conducted for determining the prevalence of non-neoplastic and neoplastic ovarian lesions in relation to patient age, reproductive duration, use of OCP and laterality, further making histological diagnosis of the nature of the non-neoplastic lesion, as well as the genesis and benign or malignant nature of neoplastic lesions and determining prognosis of malignant lesions based on microscopic grading.

Materials and Methods

All ovarian specimens surgically resected and received at the Department of Histopathology, Banas Medical College & Research Institute, Palanpur, between April 1st, 2021, and December 31st, 2022, were included in the study. Pertinent clinical information was obtained from the patients' case files in the Medical Records Division.

Histopathological analysis was conducted on 148 ovarian mass samples. The masses were measured, and their external surfaces were observed. Afterward, they were opened, and the content of cystic masses was documented. Subsequently, the specimens were fixed in 10% formalin overnight. The next day, gross examination was performed, and three sections of the cyst wall were obtained, focusing on areas with thickening or papillary excrescences. For solid tumors, one section per centimeter of tumor was taken. Additionally, a portion of non-neoplastic ovarian tissue was extracted. These sections were processed, and slides with a tissue thickness of 5 micrometers were produced and stained with hematoxylin and eosin. Microscopic characteristics were then examined, and patients were diagnosed and categorized according to the WHO classification.

Results

Among the 148 patients, 98 (66.22%) were diagnosed with non-neoplastic lesions, while 50 (33.78%) had neoplastic lesions. Within the neoplastic category, 42 (84%) were benign, 2 (4%) were borderline, and 6 (12%) were malignant. The ovarian lesions were highest among individuals aged 31 to 50 and lowest among those aged 61 to 70 {Chart 1 & 2, Table 1}.

Table 1: Distribution of ovarian lesions with respect to age of patients

Age group (years)	Number	Percentage
21 -30	15	10.1
31-40	56	37.8
41-50	57	38.5
51-60	11	7.4
61-70	9	6.1
Total	148	100.0%

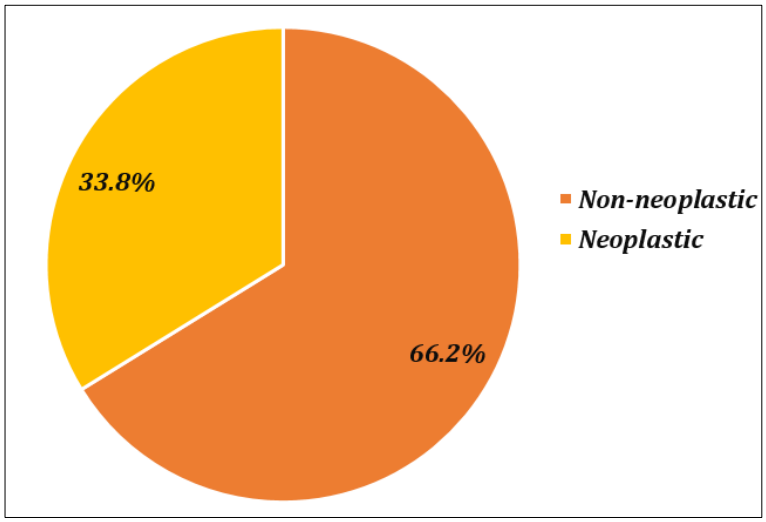

Chart 1: Distribution of ovarian lesion based on neoplasia (n=148)

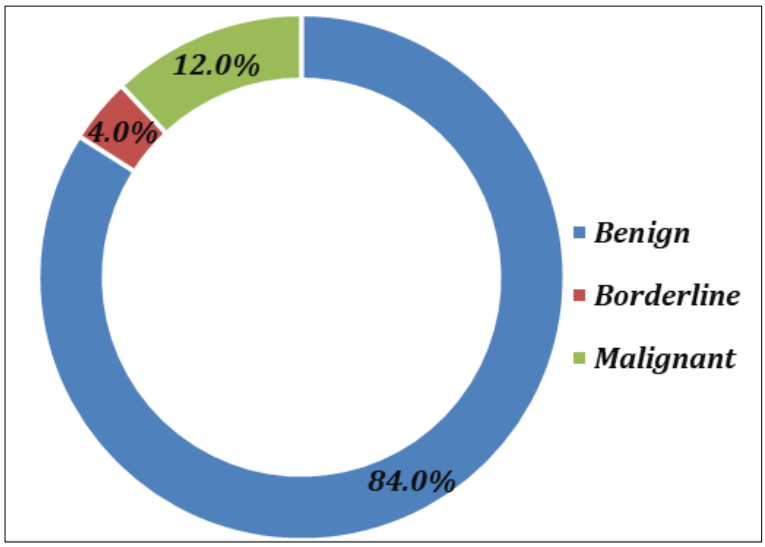

Chart 2: Distribution of neo-plastic ovarian lesions based on malignancy (n=50)

In the current study, non-neoplastic lesions were more prevalent among individuals aged 31 to 50 years. Among the 42 benign lesions, the majority were observed in the 31-50 years age group. Borderline lesions were predominantly found in individuals aged 51-60 years, while malignant lesions were distributed across all age groups except for 51-60 years. One case, operated during pregnancy, presented with a serous cyst in the ovary, while the remaining 97 cases occurred in women of reproductive age, before menopause. The majority of lesions were non-neoplastic (71%), with neoplastic lesions accounting for 29%, of which three were malignant. Further, over 90% of patients were either using oral contraceptive pills or had undergone tubectomy at the time of admission. Specifically, 95.9% of the 98 non-neoplastic lesions had a history of oral contraceptive use, and 94.9% had undergone tubectomy. Among the 42 benign lesions, 85.7% reported using oral contraceptives, and 83.3% had undergone tubectomy. One case of borderline malignancy had no history of family planning measures, while the other had undergone tubectomy. All six malignant lesions were associated with oral contraceptive use, and 83.33% had undergone tubectomy. With the exception of three cases of benign serous cystadenoma, all neoplastic tumors were unilateral.

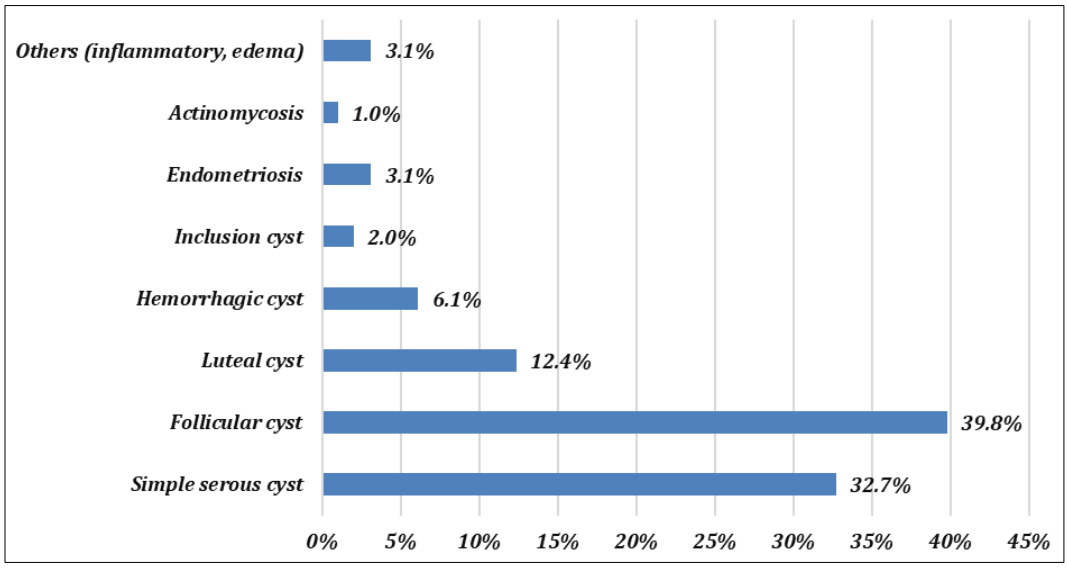

Chart 3: Categorization of non-neoplastic lesions based on predominant cell/etiology (n=98)

Present dataset, 98 cases were identified as non-neoplastic lesions, with the majority presenting as cystic formations. Among these, cysts characterized by a flat or cuboidal lining were categorized as simple serous cysts, believed to originate from follicular sources. The remaining non-neoplastic lesions were primarily follicular in nature. Additionally, we observed six cases of hemorrhagic cysts, three cases of endometriosis, and two cases of surface epithelial inclusion cysts. One case was attributed to actinomycotic infection. Analysis of neoplastic lesions based on their cell of origin revealed that 90% originated from the surface epithelium, 6% from germ cells, and 4% from sex cord stroma. Among the six malignant lesions identified in our study, grading was performed using the Shimshu-Silverberg criteria. Five of these lesions were classified as grade I, while one was classified as grade III. Grade I lesions typically exhibit a 90% 5-year survival rate, whereas grade III lesions demonstrate a significantly lower 40% 5-year survival rate.

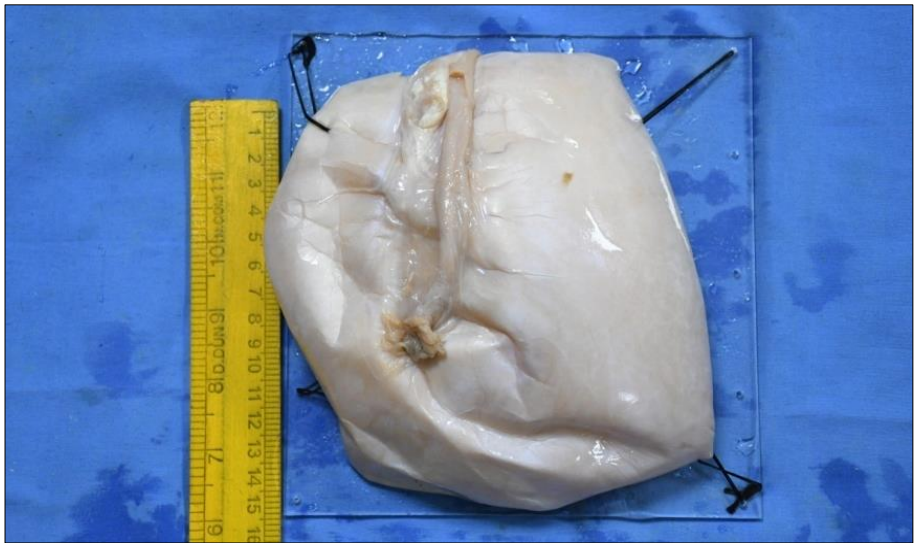

Fig 1: Serous cystadenoma of ovary

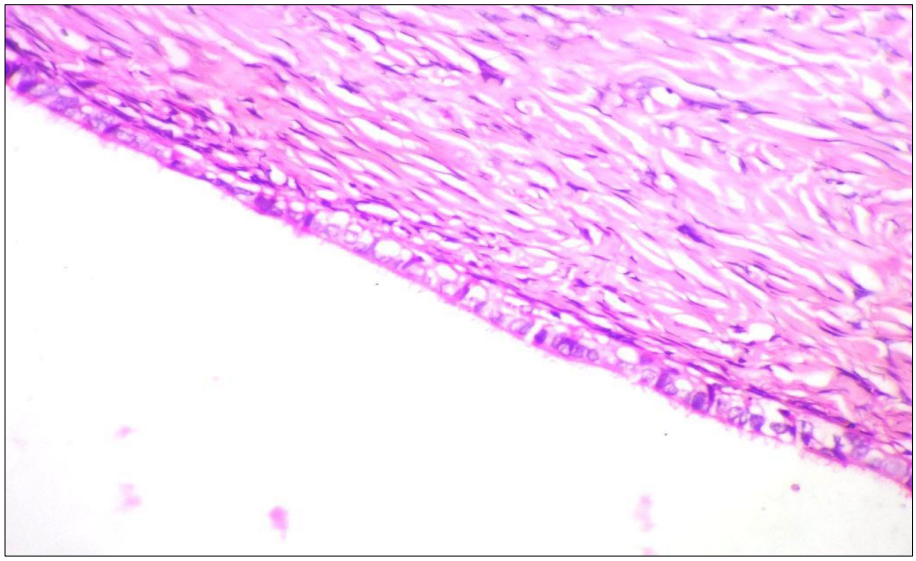

Fig 2: Micrograph of serous cystadenoma of ovary

In our investigation involving 148 lesions, non-neoplastic lesions were found to be more prevalent. These non-neoplastic lesions hold significance, as they can resemble neoplastic lesions, emphasizing the necessity for histopathological examination to confirm diagnosis. This process aids in distinguishing between functional enlargement and neoplasia, ensuring accurate treatment decisions [11]. Consistent with findings from previous studies, our research also revealed that the majority of ovarian lesions occurred within the reproductive age group.

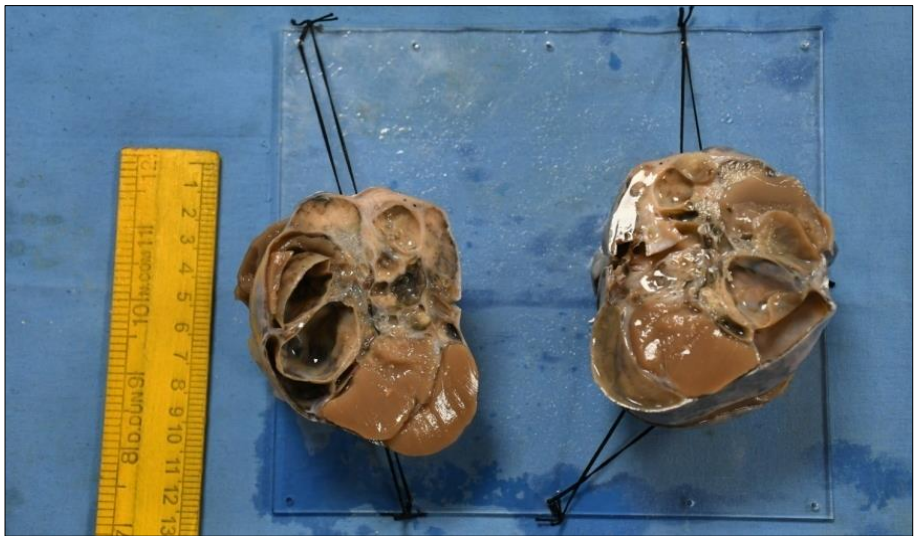

Fig 3: Mucinous cystadenoma of ovary

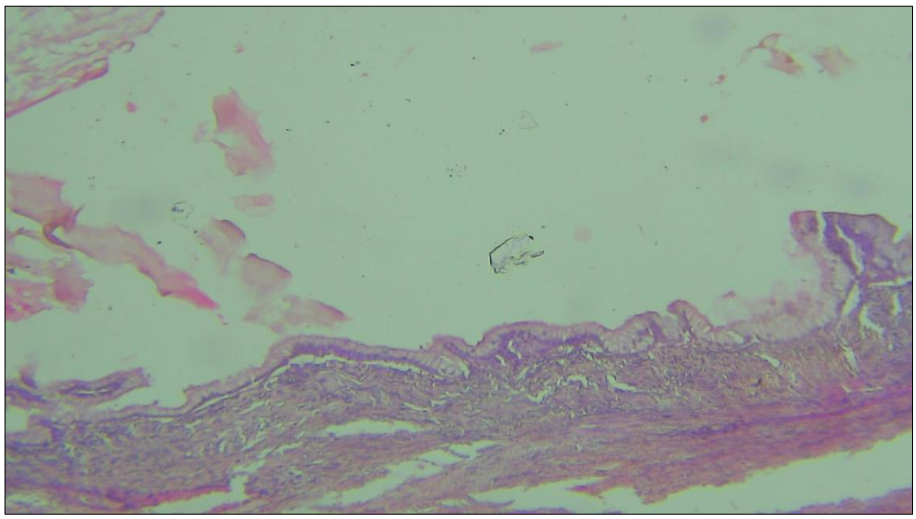

Fig 4: Micrograph of mucinous cystadenoma of ovary

Discussion

Table 2: Comparison of current study findings with other studies.

	Present study	Parvatala *et al.* (2015) [12]	Forae *et al.* (2014) [13]	Makwana H *et al.* (2013) [14]	Zaman S *et al.* (2010) [15]
Age group	36-45	31 - 50	21-40	21-40	31-40
% of Non-neoplastic lesion	66.2%	89.7%	51.27%	58.46%	68.87%

In present analysis, 87.16% of lesions were unilateral, while 12.83% were bilateral. This distribution aligns with findings from studies conducted by Verma *et al*. [16] and Madan *et al*. [17] However, studies by Kanthikar *et al*. [18] and Bhuvanesh *et al*. [19] reported a higher incidence of bilateral lesions.

Table 3: Comparison of current study bilateral findings with other studies.

Bilateral lesions	Present study	Kanthikar *et al*. (2014) [18]	Bhuvanesh *et al*. (1978)[19]	Madan *et al*. (1978) [17]	Verma *et al*. (1994) [16]
Percentage	12.83%	21.82%	25.75%	11%	11.91%

Among the 19 cases of bilateral lesions observed, 16 were identified as non-neoplastic, while two were classified as benign and one as malignant neoplastic lesions. This distribution mirrors findings reported in the study by Parvatala *et al*. [12].

All non-neoplastic lesions originated from the Graafian follicle, with some originating from the corpus luteum. This observation aligns with the findings reported by Khan *et al*.[20], which suggest that functional ovarian cysts, although non-neoplastic, have the potential to progress into tumors or contribute to tumor formation.

In present study investigation, neoplastic lesions, classified according to the WHO classification, were predominantly of surface epithelial origin. Both malignant and borderline tumors originated from the surface epithelium. Additionally, tumors originating from sex cord stromal and germ cell origins identified in our study were benign.

Table 4: Comparative study of origin of malignant ovarian lesions

Origin	Present study	Bhagyalaxmi *et al*. (2014) [21]	Kanthikar *et al*. (2014) [18]
Surface epithelial	90%	80.2%	65.68%
Sex cord stromal	4%	4.1%	5.7%
Germ cell	6%	14.2%	22.84%

Conclusion

Unlike findings from other studies, malignant lesions in present study were observed to be unilateral and could manifest in any age group. The use of Oral Contraceptive Pills (OCPs) has been associated with a reduction in the occurrence of luteal cysts. However, it's important to note that although tiny, non-neoplastic lesions may resemble malignancies, careful grossing is essential to avoid overlooking lesions within thicker walls, which may indicate a collision tumor.

Present study predominantly identified non-neoplastic lesions, with benign lesions being common among neoplastic lesions. This suggests that early intervention and surgical management may prevent the progression of lesions to malignancy. Grading plays a crucial role, as it enables patients to explore various treatment options, particularly if they fall into grade I.

While histological examination remains the gold standard for diagnosing ovarian cancers, present study observations provide valuable baseline data. The prevalence and distribution of ovarian cancers identified in our study can serve as a reference for future investigations in this field.

Acknowledgments: None.

Conflicts of interest: There are no conflicts of interest

References

1. Daru J, Zamora J, Fernández-Félix BM, Vogel J, Oladapo OT, Morisaki N, *et al*. Risk of maternal mortality in women with severe anaemia during pregnancy and postpartum: a multilevel analysis. The Lancet Global Health [Internet]. 2018 May 1;6(5):e548-54. Available from: https://doi.org/10.1016/S2214-109X(18)30078-0
2. Berek JS, Novak's Gynaecology C. Puberty. Berek & Novak's Gynecology, 15th ed. Philadelphia: Lippincott Williams & Wilkins; c2011. p. 991-1034.
3. Yeoh M. Investigation and management of an ovarian mass. Australian Family Physician. 2015;44(1/2):48-52.
4. Morgan D, Sylvester H, Lucas FL, Miesfeldt S. Cancer prevention and screening practices among women at risk for hereditary breast and ovarian cancer after genetic counseling in the community setting. Familial Cancer. 2009;8:277-87.
5. Goldstein CL. Awareness of symptoms and risk factors of ovarian cancer in a population of women and healthcare providers. Number 2/April 2015. Women's Health. 2015;19(2):206-12.
6. Cunningham FG, Nelson DB. Disseminated intravascular coagulation syndromes in obstetrics. Obstetrics & Gynecology. 2015;126(5):999-1011.
7. Zolton JR, Maseelall PB. Evaluation of ovarian cysts in adolescents. Open Journal of Obstetrics and Gynecology; c2013.
8. Beretta P, Franchi M, Ghezzi F, Busacca M, Zupi E, Bolis P. Randomized clinical trial of two laparoscopic treatments of endometriomas: cystectomy versus drainage and coagulation. Fertility and Sterility. 1998;70(6):1176-80.
9. Pal S, Chakrabarti S, Deuoghuria D, Phukan JP, Sinha A, Mondal PK. Evaluation of ultrasound-guided fine-needle aspiration cytology of ovarian masses with histopathological correlation. Acta Cytologica. 2015;59(2):149-55.
10. Crull JL, Mayer DK, Jessup AN. Early detection of ovarian cancer. Women's Healthcare: A Clinical Journal for NPs. 2014;2(1):8-13.
11. Prathima G, Shastry S. Histopathological analysis of neoplastic and non-neoplastic lesions of ovary: a study

of one hundred cases. Perspectives in Medical Research. 2014;2(3):13-7.
12. Parvatala A, Prasad JR, Rao NB, Ghanta S. Study of nonneoplastic lesions of the ovary. IOSR Journal of Dental and Medical Sciences. 2015;14(1):92-6.
13. Forae GD, Aligbe JU. A histopathological overview of ovarian lesions in Benin City, Nigeria: How common are the functional cysts? International Journal of Medicine and Public Health; c2014, 4(3).
14. Makwana H, Maru A, Lakum N, Agnihotri A, Trivedi N, Joshi J. The relative frequency and histopathological pattern of ovarian masses-11 year study at tertiary care centre; c2014.
15. Zaman S, Majid S, Hussain M, Chughtai O, Mahboob J, Chughtai S. A retrospective study of ovarian tumours and tumour-like lesions. Journal of Ayub Medical College Abbottabad. 2010;22(1):104-8.
16. Verma K, Bhatia A. Ovarian neoplasms-A study of 403 tumours. The Journal of Obstetrics and Gynecology of India. 1981;40:6-11.
17. Madan A, Tyagi SP, Mohsin S, Hameeda F, Rizvi R. Incidence of ovarian tumours at Aligarh with particular reference to histopathological typing. The Journal of Obstetrics and Gynecology of India. 1978;8:27-32.
18. Kanthikar SN, Dravid NV, Deore PN, Nikumbh DB, Suryawanshi KH. Clinico-Histopathological Analysis of Neoplastic and Non-Neoplastic Lesions of the Ovary: A 3-Year Prospective Study in Dhule, North Maharashtra, India. Journal of Clinical and Diagnostic Research; c2014.
19. Bhuvanesh U, Logambal A. Study of ovarian tumours. The Journal of Obstetrics and Gynecology of India. 1978;28:271-7.
20. Khan N, Afroz N, Aqil B, Khan T, Ahmad I. Neoplastic and nonneoplastic ovarian masses: Diagnosis on cytology. Journal of Cytology. 2009;26(4):129-33.
21. Bhagyalakshmi A, Sreelekha A, Sridevi S, Chandralekha J, Parvathi G, Venkatalakshmi A. Prospective study of histopathological patterns of ovarian tumours in a tertiary care centre; c2014.