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Histomorphometric Pattern of Ovarian Cyst in a Sub-Urban Tertiary Health Institution in Nigeria

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Abstract: In clinical settings, diagnostic ultimate goals are to identify a cyst and determine the risk of malignancy. The aim of this study was to assess the morphological and morphometric pattern of ovarian cysts among women attending Irrua Specialist Teaching Hospital (ISTH), Irrua. The histomorphometric pattern of ovarian cysts among one hundred and eighty-one (181) women attending the Gynecology Clinic at ISTH was evaluated over a period of 4 years using structured questionnaires and clinical reports from ultrasound scans and Pathology slides from the Departments of Radiology and Anatomic Pathology respectively. Results from the clinical studies revealed that the occurrence of ovarian cysts is significant ($p < 0.05$) in premenopausal women in the sampled population with the highest prevalence being follicular cysts (35.9 %). Other types of cysts found in the respondent populations were cystadenomas (25.4%), corpus luteal cysts (17.7%), endometriotic cysts (12.2%) and dermoid cysts (8.8%). However, pathologic cysts were found to be more significantly prevalent ($p < 0.05$) in women within the postmenopausal age group with highest occurrence being cystadenomas (54.92%) of all pathologic cysts in the respondent population. The dimension of the cysts ranged from 2cm to 20cm with 53.7% being greater than 8 cm in diameter. In conclusion, the highest incidence of ovarian cysts among women attending Irrua Specialist Teaching Hospital, Irrua is the follicular cyst while the least is the dermoid cyst. Also, the majority of patients with ovarian cysts who present at the Gynecology clinic have ovarian cysts which are greater than 8 cm in diameter.

Keywords: Ovarian cyst, follicular cyst, premenopausal, postmenopausal

INTRODUCTION

Ovarian cysts (OC) are occurrences in most women which are customarily said to occur most often within the period of a female's reproductive years. However, they are also found in women of any age; infants, prepubertal, premenopausal or postmenopausal women.[1,2] In most cases, ovarian cysts undergo spontaneous resolution which prevents hospital presentation by the affected women.[3] Ovarian cysts could also be incidental findings in some patients with uterine fibroids, infertility, or during routine obstetrics and gynaecological ultrasound scans. The ovarian cyst's epidemiology is ambiguous as a result of lack of frequent reporting as well as a high possibility of unprompted resolution. However, Mishra (2013) reported that hormonal imbalance, pelvic infections, diseases of the ovary, use of ovulation inducing drugs and many more factors could result in ovarian cysts formation.

The aim of this study is to assess the morphological and morphometric (radiologic) pattern of ovarian cysts among women attending Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria.

METHODOLOGY

This study sample was sourced from human subjects (patients) who attended Irrua Specialist Teaching Hospital (ISTH), Irrua. Irrua Specialist Teaching Hospital (ISTH), Irrua, is a tertiary health institution located in Irrua Local Government area of Edo State, Nigeria. The Departments of Obstetrics and Gynecology, Radiology and Anatomic Pathology were the specific units of reference in this study; where patient's history, management options, data and required materials for laboratory investigations and sonography were obtained. Female patients who attended Obstetrics and Gynecology clinic for routine investigations and treatment were the main subjects. Specifically, the history and radiographs of such patients with diagnosed or incidental ovarian cysts were sourced. These involved females within the premenopausal and postmenopausal age range between 18 and 80 years attending this Hospital for investigations and treatment. Data collection was done within the period of 60 months (January 2019 - January 2024). This was carried out using ultrasonography/Radiographs, Tissue biopsies/cytology techniques, laboratory results and administration of questionnaires to the targeted population. The details of age, dimension and type of ovarian cyst diagnosed were recorded.

The dimension and morphological characteristics of the cysts as obtained from radiological and cytological assessments were compared with the potential risks (e.g. infertility, disability, malignancy, e.t.c.) that the cysts might pose to the patient. Also, the proposed treatment and complications/ consequences of the treatment were noted as well as the clinical outcomes.

Ethical Considerations

Approval for the study was obtained from the Research Ethics Committee of the Irrua Specialist Teaching Hospital. The Research Ethics Committee Approval number given was ISTH/HREC/20180924/125. All participants in this study were briefed on the aim and objectives of the study. Individual informed consent was sought and the unwilling subjects were exempted from the study. Questionnaires were administered to those who gave their consent while assuring them of strict confidentiality.

RESULTS

Table 4.1.1: Age Distribution of Respondents

Variable	Number N = 181	Percent %
AGE (YEARS)		
< 20	9	4.97
20 – 29	69	38.12
30 – 39	48	26.52
40 – 49	20	11.05

50 - 59	16	8.84
60 - 69	11	6.08
70 - 79	7	3.87
80 - 89	1	0.55

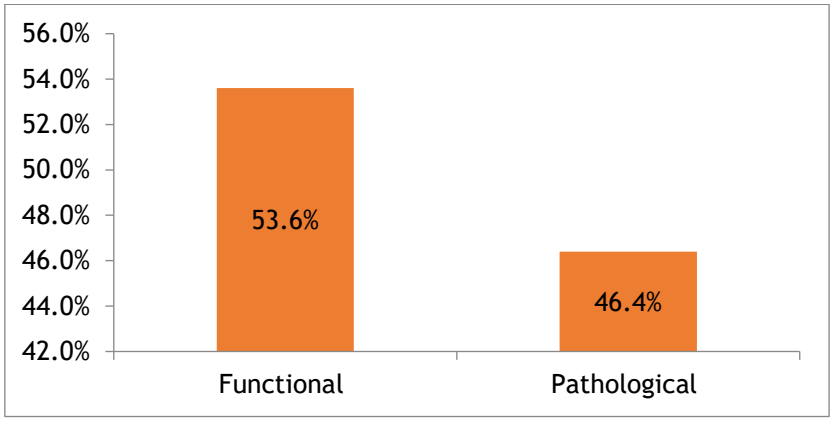


Figure 1: Classification of respondents' ovarian cysts; Functional cysts 97 (53.6%), Pathologic cysts 84 (46.4%)

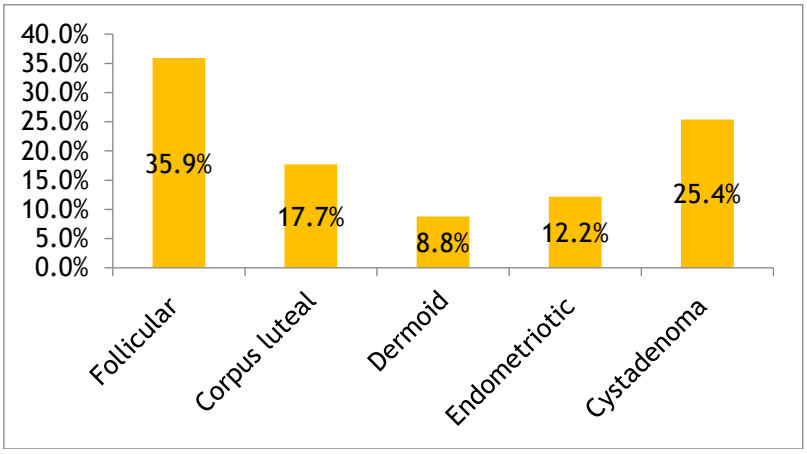


Figure 2: classification of ovarian cysts in respondents bases on sonographic appearance/pathology report. Follicular cysts 65 (35.9%), Luteal cysts 32 (17.7%), Dermoid cysts 16 (8.8%), Endometriotic cysts 22 (12.2%) Cystadenomas 46 (25.4%)

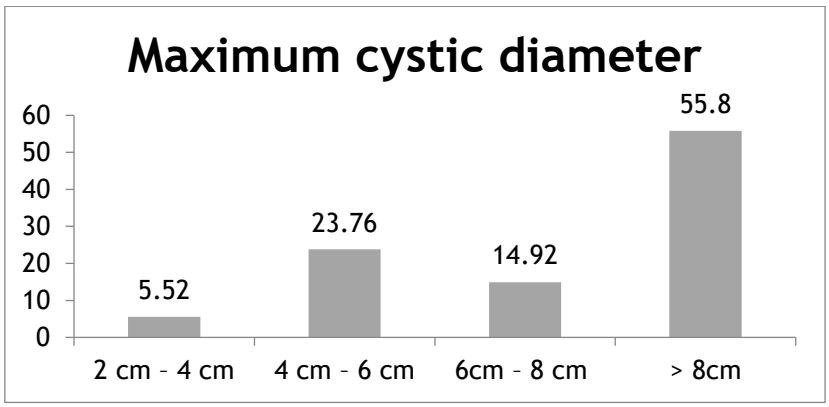
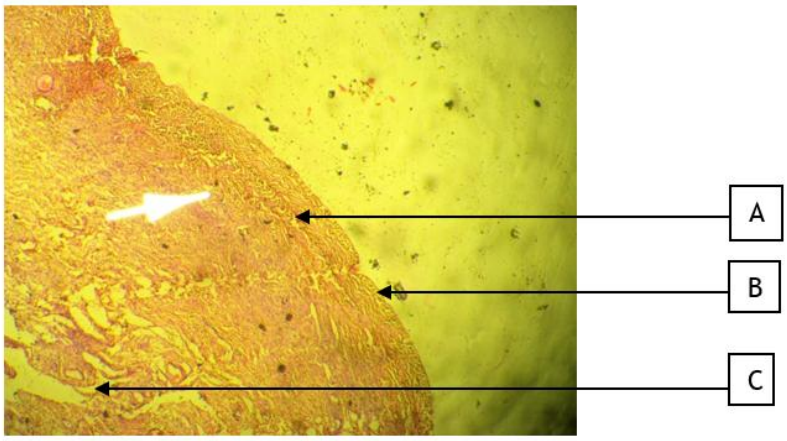
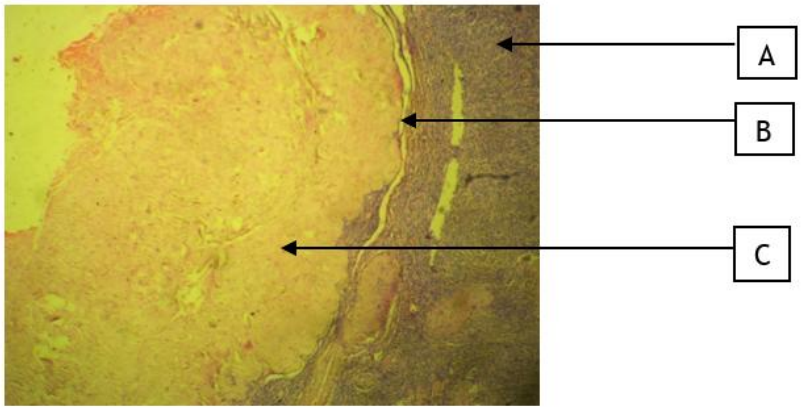


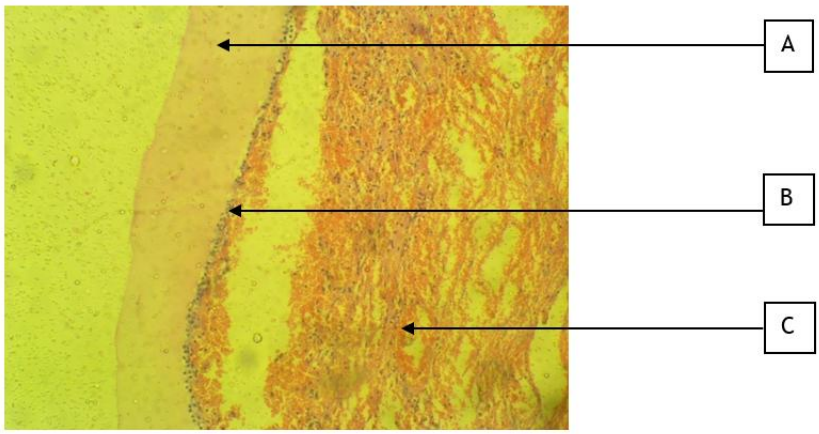
Figure 3: Classification of respondents' cysts based on diameter. 2cm-4cm (10), >4cm-6cm (43), >6cm-8cm (27) and >8cm (101).



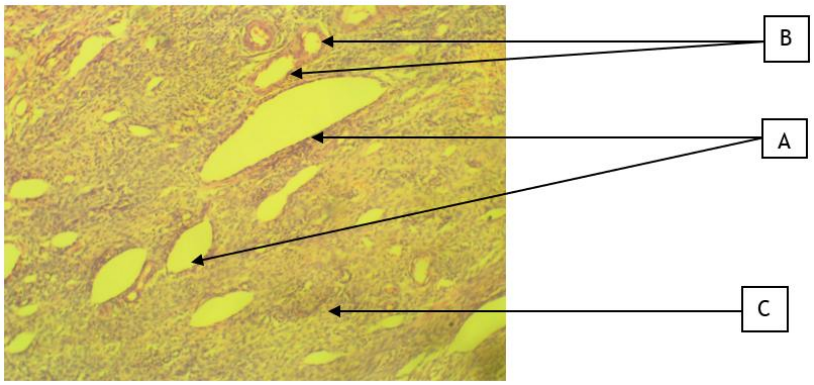
Photomicrograph of a follicular cyst showing Theca interna, (A), Theca externa (B) and Fluid filled Follicular cavity (C). (H&E x40).



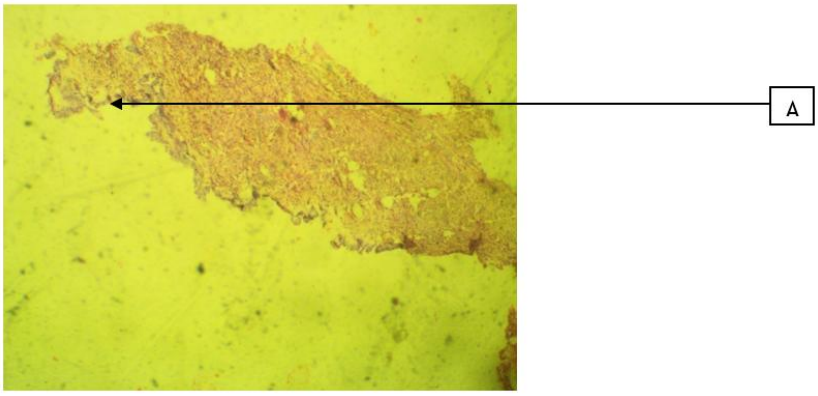
Photomicrograph of a corpus luteal cyst showing Luteinized theca folliculi (A), Membrane granulosa(B) and Fluid filled follicular cavity(C). (H&E X40).



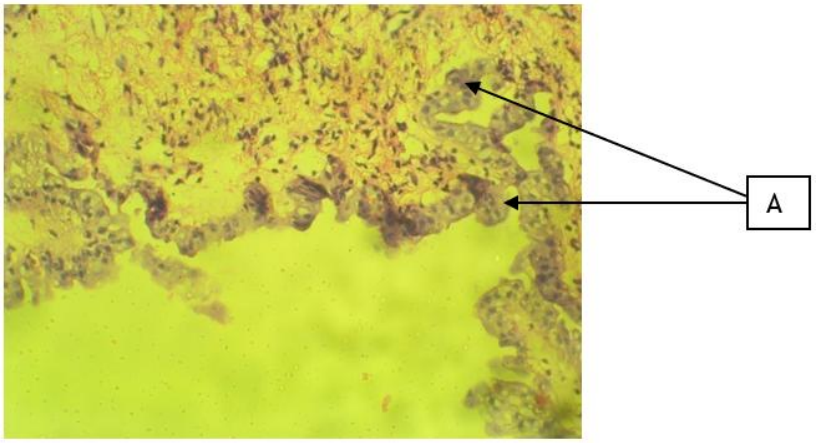
Photomicrograph of a corpus luteum hemorrhagicum showing Theca externa and interna (A), Granulosa cells(B) and Blood filled follicular cavity (C). (H&E X40).



Photomicrograph of an endometrotic cyst showing Uterine/ endometrial glands(A), Blood vessels (B) and Connective tissue (stroma) (C). (H&E X40).



Photomicrograph of a mucinous cystadenoma showing Surface epithelium(A). (H&E X40).



Photomicrograph of a mucinous cystadenoma showing A: Stratification with cellular Budding and presence of Paneth cells. (H&E X400).

DISCUSSION

An assessment was made of the clinical presentations, ultrasound scan and histopathologic findings of the diagnosed ovarian cysts. The age range for the sampled population was

between 18 to 80 years. The mean age ± standard deviation was 37 ± 14 years. This is not far-fetched from the mean age (34 ± 9 years) of women with ovarian and paraovarian cysts across forty-one nationalities from around the world, as documented by Zahra and Rizvi (2016). [4] The age range of those with the highest incidence of ovarian cyst among the sampled population was between 20-29 years which constituted 38 % of the sampled population. This finding is consistent with a study by Azhar *et al.,* [(5)] who found the highest incidence of ovarian cysts in the same age range (21-30 years), and the finding of 27 % of the sampled population between 30-39 years is also consistent with previous findings [(5,6,7)]. It is obvious from this study that ovarian cyst is commoner in women of reproductive age group as also reported in previous studies [(8,7,21,22)]. Hence, there exist statistically significant association ($p<0.05$) between the mean age of the sampled population and the nature of cyst (functional or pathologic) present. This suggests that the presence of either functional or pathologic cysts is dependent on age group which has been previously noted in related studies [(9,10)].

A greater percentage of cysts present in the sampled population (55.8 %) were greater than 8 cm in diameter. There is a statistical correlation between the size of cysts present and the nature of cyst in the present study. Similar finding was made by Katz *et al.*, [(11)] and Knudsen *et al.,* [(12)] who stated that the size of an ovarian cyst could go a long way in diagnosing its nature using radiological assessment. Also, Dutta [(13)] stated that the physiologic cysts can be differentiated from the neoplastic cysts as they are, typically 6-8 cm. In the present study, cysts which were 3 - 7 cm in diameter on radiological assessment were managed conservatively without surgery. However, some ovarian cysts with greater diameters were surgically excised for histological assessment. A similar report to the foregoing is that of Neelgund *et al.,* [(14)] in which indication for surgical removal were large mass >6 cm, masses which are symptomatic and presence of solid components, persistent ovarian cyst that is less than 6 cm even after three continuous months of oral contraceptive therapy and acute symptoms indicative of torsion.

A greater percentage of the benign cysts in this population of study were simple cysts (functional) which constituted 53.6 % while the complex cysts (pathological) constituted 46.4 % of the sampled population. This finding is also consistent with the reports on higher incidence of simple cysts as compared to complex cysts [(15,1)].

The histological findings on the ovary of the sampled population at Irrua Specialist Teaching Hospital, Irrua, revealed five types of cysts. These include; follicular cysts, corpus luteal cysts, corpus luteal hemorrhagicum, endometriotic cysts and cystadenomas (serous and mucinous). The most prevalent of ovarian cysts in the sampled population is the follicular cyst. Considering the age distribution of the sampled women, it could be deduced that women within the reproductive age are more prone to developing functional cysts which are related to the ovarian and menstrual cycles. However, from the current study, cystadenomas had the second highest incidence amongst the respondent population. It is worthy of note that majority of patients with cystadenomas were within the postmenopausal age group. This corroborates the findings of Seidman and Mehrotra [(16)] as well as Begum *et al.,* [(17)] that cystadenomas are commoner in women above 40 years with the peak being 45 to 50 years.

The micrographs of follicular cysts found in respondents in the sampled population at Irrua Specialist Teaching Hospital, Irrua, revealed fluid-filled follicular cavities bounded

by granulosa membranes and theca folliculi just as described by Katz *et al.*, [11]. Luteinized theca folliculi and fluid-filled follicular cavities bounded by membrane granulose were observed on photomicrographs of corpus luteal cysts found in women attending Irrua Specialist Teaching Hospital, Irrua. This is consistent with the findings of Katz *et al.*, [11] and Shwayder, [18]. Endometriosis is a disease that is characterized by ectopic growth of endometrial tissue outside the uterine cavity [19]. It was observed in this study that the histology of endometriotic cysts found in the sampled population is characterized with presence of endometrial/uterine glands, blood vessels and connective tissue. Also, this study revealed that micrographs of mucinous cystadenomas found in women attending Irrua Specialist Teaching Hospital, Irrua shows stratification of the surface epithelium with cellular budding and presence of Paneth cells. Mucinous cyst adenomas are one of the common tumors of ovary [20]. This is consistent with the findings on cystadenomas in this study where they account for the second most common ovarian cyst found in the respondents from Irrua Specialist Teaching Hospital, Irrua.

CONCLUSION

The histomorphometric pattern of ovarian cysts among women attending Irrua Specialist Teaching Hospital, Irrua was assessed via sociodemographic, radiological and histological parameters.There is significant association between the occurrence of ovarian cysts and age of respondent women attending Irrua Specialist Hospital, Irrua. The highest incidence of ovarian cysts was found in women within the reproductive age and these were mainly functional cysts while cystadenomas are the most prevalent type of ovarian cysts amongst the post-reproductive age women in the study population at ISTH. Most cystic formations that were presented at the Gynaecologic clinics were greater than 8cm and were managed via surgery.

Competing interest

No conflict of interest is associated with this work.

Authors' contribution

All authors of this article contributed to the successful completion of this research.

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