An Analysis of the Clinicopathologic Characteristics of Ovarian Tumours in Ile-Ife, Nigeria

[1]D Sabageh, [2]OO Olaofe and [3]AO Sabageh

[1]Department of Anatomical Pathology and Histopathology, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.

[2]Department of Morbid Anatomy and Forensic Medicine, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria.

[3]Department of Community Medicine, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.

Abstract

Background: *Ovarian tumours are a diverse and complex group of neoplasms. They occur in women of all ages and are notorious for their infrequently large sizes. Determination of the various histological patterns is important for treatment and prognostication. This study attempts to analyze the various clinicopathological characteristics of benign and malignant ovarian tumours and compare these with what is known in other parts of the world.*

Methods: *The surgical specimens of patients with ovarian tumours sent to the Histopathology Department of the Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria within a 5-year period constituted the materials for the study.*

Results: *The overall mean age at presentation for the 69 ovarian tumours was 34.8 years (SD±15.3) while the age range was from 1 to 80 years. The highest frequency of cases was seen in the 21-30 year age-group. Majority of tumours (75.3%) occurred between 21 and 50 years. Benign tumours accounted for majority of cases (69.6%). Majority of the tumours (78.3%) showed a predominantly cystic appearance. Surface epithelial (43.4%) and germ cell tumours (40.6%) were the most frequent tumours encountered. Malignant surface epithelial tumours were most prevalent within the 41-50 year age group. The mean age at presentation was higher for malignant than benign serous tumours ($p<0.05$) while the mean age at presentation was lower for benign than for malignant mucinous tumours ($p>0.05$). There was no significant difference between the mean diameters for benign and malignant epithelial tumours. Malignant germ cell tumours occurred only in young girls.*

Conclusion: *Overall the age distribution and histological patterns of the ovarian tumours seen were similar to what has been reported in other parts of the world although malignant epithelial tumours in our series tended to occur at a slightly younger age.*

Keywords: Clinicopathologic characteristics, Ovarian tumours, Ile-Ife, Nigeria

Correspondence to: Dr Donatus Sabageh Department of Morbid Anatomy and Histopathology, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria. Phone: +234 803 326 3448
E-mail: dsabageh@yahoo.com

No conflicts of interest have been declared by the authors

Introduction

Ovarian tumours are diverse and represent a large, heterogeneous and complex group of neoplasms that are relatively uncommon in women especially in Asia, Africa and Latin America[1,2]. Nevertheless, most tumours of the ovary can be grouped into one of three major categories which include surface epithelial – stromal tumours, sex cord-stromal tumours and germ cell tumours according to the anatomic structures from which they presumably originate[3]. Ovarian tumours are known to affect women of all ages. Most are, however, functional in nature and resolve with minimal treatment although they can also herald an underlying malignant process[4]. They are also notorious for their infrequently large sizes and association with relatively mild or vague clinical signs and symptoms in the early stages even when malignant[5].

Differentiation between non-neoplastic, benign and malignant neoplastic ovarian disorders can be difficult but clinically relevant as proper treatment depends on knowing the exact histological abnormality[4,6,77]. Furthermore, determination of the various histological patterns is important for prognostication as ovarian malignancy, the second most common cancer of the female genital tract, has very poor long-term prognosis. Moreover, it is the leading cause of death from gynaecologic malignancy with no reliable means for early detection except genetic screening for high risk individuals[4]. Therefore, detailed analysis of the characteristics of ovarian tumours is important. The understanding of the molecular pathogenesis of ovarian neoplasms has been hindered by the lack of a sufficient number of specimens at early-stage disease making it difficult to identify precursor lesions that ultimately develop into cancer[4]. The aetiology of ovarian tumours is still poorly understood as previous studies have focused mainly on epithelial tumours[4]. Many published clinicopathologic studies have paid little attention to benign ovarian tumours despite the fact that they are more common[8].

This article, therefore, attempts to analyze the various clinicopathological characteristics of benign and malignant ovarian tumours seen at a tertiary health institution in South-Western Nigeria over a period of 5 years and compare these with what is known in other parts of the world.

Material and Methods

The surgical specimens of patients with ovarian tumours sent to the Histopathology Department of the Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria within the 5 year period from January 2004 to December 2008 formed the basis of the study. The hospital is the main tertiary referral centre serving a population of about 1,333,603 people (1991 census) in the Ife-Ijesa zone of South-Western Nigeria.

All specimens were routinely fixed in 10% buffered formal saline, embedded in liquid paraffin wax and stained routinely with haematoxylin and eosin. The original request cards and surgical pathology reports were scrutinized and necessary data including patient's age, presenting symptoms, largest tumour diameter, tumour location (right, left or bilateral) extracted. The morphological appearances of the tumours were recorded as either solid or cystic depending on which pattern predominated. The tumours were histologically classified according to the World Health Organization Histological Classification of Ovarian Tumours[9].

Statistical analysis was done using SPSS version 15. The mean and standard deviation were calculated where necessary. Appropriate bivariate analyses such as chi-square, t-test were carried out where necessary to assess statistical association depending on the type and nature of the variables. The significance level was set at $p<0.05$.

Results

The overall mean age at presentation for the 69 ovarian tumours reviewed ovarian tumours was 34.8 years (SD±15.3) while the age range was from 1 to 80 years. The overall median age at presentation was 32 years. The highest frequency of cases was seen in the 21-30 year age-group with 25 cases (36.2%) although majority of ovarian tumours (75.3%) occurred in women between 21 and 50 years of age (Table 1). The lowest frequencies of cases were seen in the 61-70 and 71-80 year age-groups with 2 cases (2.9%) each. Only 8 cases (11.5%) were seen in females younger than 20 years old. Table 1 also shows that benign tumours accounted for 48 cases (69.6%) while malignant tumours accounted for only 21 cases (30.4%). Malignant ovarian tumours constituted on 2.3% of all malignant tumours and 12.3% of all malignant female genital tract tumors seen within the period under review.

Overall, majority of the tumours (78.3%) showed a predominantly cystic appearance while 15.0% had a predominant solid cut surface (Table 2). Most tumours (76.8%) were less than 20.0cm in their widest diameter. Of these 27 (39.1%) were less than 10.0cm in diameter. The smallest and largest diameters recorded were 3.0cm and 36cm respectively. Overall 37 tumours (53.6%) were located in the right ovary while 26 cases (37.7%) were located in the right ovary and 6 cases (8.7%) were bilateral.

Surface epithelial and germ cell tumours were the most frequent tumours encountered with 30 cases (43.5%) and 28 cases (40.6%) respectively (Table 1). They were most frequently found in the 21-30 year age group. There were only 8 cases (11.6%) of sex cord-stromal tumours and 3 (4.3%) metastatic tumours. Benign tumours formed the vast majority of both surface epithelial (66.7%) and germ cell tumours (89.3%). Malignant surface epithelial tumours were not seen below the age of 30 years being most prevalent within the 41-50 year age group. On the other hand, 62.5% of sex cord-stromal tumours were malignant and these were seen in virtually all age groups. Teratomas were the most common tumours encountered with 26 cases representing 37.7% of all tumours (Table 2). Serous cystadenomas accounted for 23.2% of cases while mucinous tumours accounted for 7.2% of cases. On the other hand, malignant serous and mucinous tumours accounted for 8.7% and 2.9% of cases respectively. There were 5 cases (7.2%) of granulosa cell tumours.

According to Table 2, the mean age of presentation for benign serous tumours of the ovary was 34.8 years while that for malignant serous tumours was 47.5 years. This difference in mean age was found to be statistically significant ($t=4.06$, $p<0.05$). The mean age at presentation for benign mucinous tumours was 41.8 years while that for malignant mucinous tumours was 49.7 years (median 37.0 years). This difference was, however, not statistically significant ($t=0.46$, $p>0.05$). The mean age for teratomas was found to be 27.1 years. The mean age for malignant germ cell tumours was lower than for other tumour groups.

There was no significant difference between the mean diameters for benign and malignant serous tumours which were 14.8cm and 14.4 cm respectively ($t=0.08$, $p>0.05$). The mean diameters for benign and malignant mucinous tumours were 25.4cm and 16.8 cm respectively. This difference in mean diameters for mucinous tumours was also not statistically significant ($t=1.27$, $p>0.05$).

About 62.5% of benign and 66.7% of malignant serous surface epithelial tumours were located in the right ovary while 75.0% of benign and 66.7% of malignant mucinous surface epithelial tumours were located in the right ovary. Majority (69.2%) of teratomas were located in the right ovary.

According to Table 3, the most common presenting symptoms were abdominal pain (46.4%) and abdominal swelling (40.6%). Weight loss was the mode of presentation in 8.7% of cases. Nine cases (13.0%) were

Table 1: Distribution of the various classes of ovarian tumours in the different age groups

Age Group	CLASSES OF TUMOURS										
	Surface Epithelial Tumours			Germ Cell Tumours			Sex Cord Tumours			Metastatic Tumours	Grand Total (%)
	benign	malignant	Total	benign	malignant	Total	benign	malignant	Total	malignant	
0-10	0	0	0	2	1	3	0	0	0	0	3(4.3)
11-20	0	0	0	2	1	3	1	0	1	1	5(7.2)
21-30	10	0	10	11	1	12	0	1	1	2	25(36.2)
31-40	4	3	7	8	0	8	0	1	1	0	16(23.2)
41-50	5	4	9	2	0	2	0	0	0	0	11(15.9)
51-60	1	2	3	0	0	0	0	2	2	0	5(7.2)
61-70	0	0	0	0	0	0	1	1	2	0	2(2.9)
71-80	0	1	1	0	0	0	1	0	1	0	2(2.9)
Total (%)	20	10	30(43.5)	25	3	28(40.6)	3	5	8(11.6)	3(4.3)	69(100.0)

Table 2: Distribution of cases in relation to histology, age, size, bilaterality and tumour consistency

HISTOLOGY	Total No.	PATIENT AGE		TUMOUR SIZE		TUMOUR CONSISTENCY		TUMOUR LOCATION		
		Age range	Mean age (Median age)	Range(cm)	Mean(cm)	Solid	Cystic	Right	Left	Bilateral
Cystadenofibroma	1	23	23	5.5	5.5	0	1	0	1	0
Serous cystadenoma	16	24 -51	34.8 ± 9.5 (31.0)	4.0 – 28.0	14.8 ± 8.9	0	16	10	4	2
Mucinous cystadenoma	4	24 -58	41.8 ± 15.2 (42.5)	14.0 -36.0	25.4 ± 9.0	0	4	0	3	1
Serous cystadenocarcinoma	6	40 -54	47.5 ± 5.0 (48.5)	9.0 -19.0	14.4 ± 4.2	2	4	4	1	1
Mucinous cystadenocarcinoma	3	32 – 80	49.7 ± 26.4 (37.0)	11.0 – 27.0	16.8 ± 8.8	0	3	0	2	1
Teratoma	26	1 – 48	27.1 ± 10.9 (27.5)	6.0 - 30.0	11.2 ± 6.2	1	25	18	8	0
Dysgerminoma	1	18	18.0	18.0	18.0	0	1	0	1	0
Embryonal carcinoma	1	19	19.0	17.0	17.0	1	0	0	1	0
Fibrothecoma	3	18 – 80	53.0 ± 31.8 (61.0)	3.0 – 23.0	12.3 ± 10.1	3	0	1	2	0
Granulosa cell tumour	5	25 – 68	48.0 ± 13.4 (55.0)	11.0 – 30.0	17.7 ± 8.2	5	0	2	3	0
Metastatic carcinoma	3	19 – 30	24.7 ± 5.5 25.0)	8.0 -14.0	11.3 ± 3.0	3	0	2	0	1
TOTAL	**69**					**15**	**54**	**37**	**26**	**6**

asymptomatic and the tumours were detected whilst the patients were being investigated for other conditions.

Table 3: Mode of presentation of cases

Presentation	Frequency (%)
Asymptomatic	9 (13.0)
Infertility	1 (1.4)
Menorrhagia	4 (5.8)
Weight loss	6 (8.7)
Abdominal pain	32 (46.4)
Abdominal mass	6 (8.7)
Abdominal swelling	28 (40.6)

Discussion

This study shows that the overall age distribution of our patients with ovarian tumours are similar to what obtains in other parts of the world[2,8,1,2]. The vast majority (75.3%) of our patients were clustered between the ages of 21 and 50 years while the overall mean and median ages at presentation were 34.8 years and 32 years respectively. The highest frequency of cases was seen in the 21-30 year age group. Benign tumours also constituted the majority (69.6%) of tumours. While ovarian tumours were seen in females of all ages, this study like others similar to it also shows that ovarian tumours are relatively uncommon in children[4,3,]. While this may suggest an important role for long exposure to internal and/or external environmental factors in the pathogenesis of these tumours[12], the low frequency of childhood cases may actually be due to under-diagnosis of such tumours at our centre.

The commonest category of tumours we encountered were epithelial tumours which accounted for 43.5% of cases. These epithelial tumours were not seen in children less than 20 years old. Serous and benign tumours respectively formed the bulk of these tumours, the commonest epithelial tumour being serous cystadenoma. This finding is similar to previous reports from other parts of the world[2,8,4,55,6].

Our study also shows that benign epithelial tumours (both serous and mucinous) occurred at a relatively younger age when compared with their malignant counterparts although this association was found to be statistically significant for only serous tumours. However, the mean age at presentation of malignant epithelial tumours in our study was ealier than most Western and Japanese series[11]. Serous cystadenomas and serous cystadenocarcinomas are known to constitute the majority of benign and malignant epithelial tumours respectively while primary mucinous carcinomas on the other hand are uncommon and usually require careful clinicopathological exclusion of a metastatic origin[7]. Nevertheless, malignant epithelial tumours are generally known to be more common in older women especially between the ages of 40 and 65 years[8].

Okugawa *et al*[8] were able to demonstrate that larger ovarian tumours were more likely to be malignant, our study seems to suggest that benign and malignant serous tumours did not differ much statistically in their mean diameters. On the contrary, we found that benign mucinous tumours had a larger mean diameter than their malignant counterparts although this association was not statistically significant. The larger sizes of the benign mucinous tumours may, however, be due to the fact that such cases presented to the hospital much later than their malignant counterparts. Interestingly, within each category, tumour diameters were largest for both benign serous and mucinous tumours. This notwithstanding, it is imperative that all ovarian tumours be properly evaluated irrespective of their sizes in order to ensure that malignant tumours are detected as early as possible.

Germ cell tumours, the second most common tumour group, constituted about 40.6% of all the tumours in this study with benign

teratomas accounting for the vast majority of cases. Indeed, teratomas were the most common single histological type of ovarian tumours accounting for 36.2% of all tumours seen. These teratomas occurred in relatively younger women and children (mean age of 27.1 years) and were not seen after the age of 48 years. All patients with malignant germ cell tumours were, however, younger than 20 years old. These findings are similar to those from other studies all over the world[2,4, 8,11,12, 13,9,10]. The early age of occurrence of malignant germ cell tumours calls for early intervention with prompt and effective treatment to reduce the associated morbidity and mortality[18].

Sex cord-stromal tumours represented about 11.6% of all cases from this study. Majority of these tumours (62.5%) were granulosa cell tumours and they occurred in women both within the reproductive age group as well the post-menopausal period. Adult granulosa cell tumours were, however, more common than the juvenile type. Similar observations were made women all around the world[4,5] . These tumours are of interest because of their hormonal effects which are rare in other ovarian neoplasms[4].

The mean age of 24.7 (±5.5) years for metastatic ovarian tumours from this study shows that patients with metastatic tumours were relatively younger that those with primary malignant epithelial tumours. Many similar studies have corroborated this fact[11]. While we could not ascertain the primary origins of our cases, it is generally known that the most common primary origins are the breast, colon, and stomach and that the prevalence of such metastatic tumors correlates closely with the incidence rates and spread patterns of the primary origins[4,12].

In this study, we noted that benign ovarian tumours were commoner than malignant tumours. Surface epithelial tumours were the commonest group followed closely by germ cell tumours. Benign epithelial tumours occurred at a younger age than their malignant counterparts. There appeared to be no significant difference in size between benign and malignant epithelial tumours. Germ cell and metastatic tumours occurred in much younger women while malignant germ cell tumours were not seen in women above 20 years. Sex cord-stromal tumours were relatively uncommon with granulosa cell tumours accounting for the majority. Overall the age distribution and histological patterns of the ovarian tumours seen were similar to what has been reported in other parts of the world though malignant epithelial tumours in our series tended to occur at a slightly younger age.

References

1. Young RH, Clement PB and Scully RE. The Ovary. *In*: Sternberg SS (ed.): Diagnostic Surgical Pathology. 3rd ed. Philadelphia: Lippincott, Williams & Wilkins. 1999: 2307-2394.
2. Obed JY, Khalil MIA and Ekanem ED. Histological Types of Ovarian Tumours in an African Teaching Hospital in North-eastern Nigeria. J Obs and Gyn. 1999; 19(5): 526-528.
3. Chen VW, Ruiz B, Killeen JL, Cote TR, Wu XC and Correa CN. Pathology and classification of ovarian tumours. Cancer Supplement. 2003; 97(10): 2631-2642.
4. Zaman S, Majid S, Hussain M, Chughtai O, Mahboob J and Chughtai S. A restrospective study of ovarian tumours and tumour-like lesions. J Ayub Med Coll Abbottabad. 2010;22(1):104-108.
5. Scully RE, Young RH and Clement PB. Atlas of tumour Pathology. Tumours of the ovary, maldeveloped gonads, fallopian tube and broad ligament. 3rd series, Fascicle 23. Armed Forces Institute of Pathology. 1999.
6. Mohammed A, Ahmed SA, Oluwole OP and Avidine S. Malignant Tumours of the Female Genital Tract in Zaria, Nigeria: Analysis of 513 Cases. Annals of African Medicine. 2006;5(2):93-96.
7. Faggad A, Darb-Esfahani S, Wirtz R, Sinn B, Sehouli J, Konsgen D, *et al.*

Expression of Multidrug Resistance-Associated Protein 1 in Invasive Ovarian Carcinoma: Implication for Prognosis. Histopathology. 2009; 54: 657-666.

8. Okugawa K, Hirakawa T, Fukushima K, Kamura T, Amada S and Nakano H. Relationship between Age, Histological Type, and Size of Ovarian Tumours. Int J Gyn & Obs. 2001; 74(1): 45-50.
9. Fritz A, Percy C, Jack A, Shanmugaratnam K, Sobin L, *et al.* International Classification of Diseases in Oncology. Third ed. Geneva. World Health Organization; 2000.
10. Jha R and Karki S. Histological pattern of ovarian tumours and their age distribution. Nepal Med Coll J. 2008; 10(2): 81-85.
11. Mondal SK, Banyopadhayay R, Nag DR, Roychowdhury S, Mondal PK and Sinha SK. Histologic pattern, bilaterality and clinical evaluation of 957 ovarian neoplasms: A 10-year study in a tertiary hospital of eastern India. J C Res Ther. 2011; 7(4): 433-437.
12. Junaid TA. Ovarian neoplasms in children and adolescents in Ibadan, Nigeria. Cancer. 1981; 47: 610-614.
13. Jha R and Karki S. Histological pattern of ovarian tumours and their age distribution. Nepal Med Coll J. 2008; 10(2): 81-85.
14. Mondal SK, BAnyopadhayay R, Nag DR, Roychowdhury S, Mondal PK and Sinha SK. Histologic pattern, bilaterality and clinical evaluation of 957 ovarian neoplasms: A 10-year study in a tertiary hospital of eastern India. J C Res Ther. 2011; 7(4): 433-437.
15. Maheshwari V, Tyagi SP, Saxena K, Tyagi N, Sharma R, Aziz M and Hameed F. Surface Epithelial Tumours of the Ovary. Indian Journal of Pathology and Microbiology. 1994; 37(1): 75-85.
16. Herrington CS. Recent Advances in Molecular Gynaecological Pathology. Histopathology. 2009; 55: 243-249.
17. Crum CP. The Female Genital Tract. In Kumar V, Abbas A and Fausto N (Eds): Pathologic Basis of Disease (7th Edition). Philadelphia; Elsevier Saunders. 2005; 1059-1117.
18. Ahmed SA, Mohammed A, Akpa M, Waziri GD and Yusuf R. Ovarian germ cell tumours in Zaria, Nigeria. Annals of Tropical Pathology. 2011; 2(2): 99-102.
19. Outwater EK, Siegelman ES and Hunt JL. Ovarian Teratomas: Tumour Types and Imaging Characteristics. Radiographics. 2001; 21: 475-490.
20. Stanojevic Z, Djordejevic B and Dunjic O. Metastatic Tumours of the Ovary: The Rate of Incidence and the Most Frequent Sites of Primary Tumours. Acta Medica Medianae. 2007; 46(4): 5-9.
21. Lee SJ, Bae JH, Lee AW, Tong SY, Park YG and Park JS. Clinical Characteristics of Metastatic Tumours of the Ovaries. J Korean Med Sci. 2009; 24(1): 114-119.