December 2000

Histological pattern of ovarian neoplasma.

Zubair Ahmad
Agha Khan University, zubair.ahmad@aku.edu

Naila Kayani
Aga Khan University, naila.kayani@aku.edu

Sheema H. Hasan
Aga Khan University, sheema.hasan@aku.edu

Suhail Muzaffar

Muhammad Shafiq Gill

Recommended Citation

Ahmad, Z., Kayani, N., Hasan, S. H., Muzaffar, S., & Gill, M. S. (2000). Histological pattern of ovarian neoplasma. *Journal of Pakistan Medical Association, 50*(12), 416-419.

Histological Pattern of Ovarian Neoplasma

Zubair Ahmad,Naila Kayani,Sheema H. Hasan,Suhail Muzaffar (Department of Pathology, The Aga Khan University Hospital, Karachi.)

Muhammad Shafiq Gill (Department of Pathology, the Aga Khan University Hospital, Karachi.)

Abstract

Objective: To see the morphological pattern of benign and malignant ovarian neoplasms.

Method: Retrospective study of all consecutive cases of ovarian neoplasms diagnosed at Aga Khan University Hospital between 1st January 1993 and 30th September 1998.

Setting: The Section of Histopathology, AKUH, Karachi.

Observation: Of 855 ovarian tumours 506 (59.18%) were benign and 349(40.81%) malignant. Surface epithelial - stromal tumours comprised 63.50% of all tumours. Benign cystic teratoma was the commonest benign tumour (35.17% of all benign tumours) and serous cystadenocarcinoma was the commonest malignant tumour (33.33% of all malignant tumours). Mucinous cystadenocarcinomas are more common in our population as compared to the West and borderline and malignant mucinous tumours occur at a younger age group. Malignant germ cell tumours are also common in our population.

Conclusion: Except for the greater frequency of malignant mucinous and germ cell tumours, the findings of our series correspond to the published Western data (JPMA 50:416, 2000).

Introduction

Ovarian neoplasms arc common turnours in females comprising 23% of all gynecologic tumours and are the most common gynaccologic malignancy[1]. They are the 5th leading cause of cancer deaths in women in the U.S.A[2]. A local study at (AFIP),Armed Forces Institute of Pathology, Rawalpindi showed that gynecological malignancies are not uncommon among Pakistan females[3]. Women between 65 and 84 years of age have ovarian cancer incidence rates 2 to 3 times higher than younger women[4]. A major problem with these tumours is that they initially give rise only to vague signs and symptoms. Ovarian tumours are notorious for their large size and their frequent association with relatively mild symptoms[5]. Risk Factors for ovarian cancer are not well defined. However there is general agreement on two: nulliparity and family history. A higher frequency of carcinoma is seen in unmarried women and in married women with low parity[6]. The aim of our study is to determine. in a large series of patients. the histological pattern of ovarian neoplasms and to correlate our findings with national and international published data.

Material and Methods

To establish the histological pattern and frequency of benign and inaliguatit ovarian neoplasms, all specimens received in the Section of Histopathology, AKUH over a period of 5years and 9 months. i.e., from 1St Januar. 1993 to 30th September. 1998 were reviewed.

All 855 specimens of ovarian tumors were fixed in I0% buffered formalin and allowed to stay overnight. Specimens were grossed and adequate representative sections were taken according to the guidelines given in Rosai[7] with special emphasis given in case of large specimens to solid foci, areas adjacent to the ovarian surface and bases of papillary formations.

The sections were then routinely processed under standardized conditions for paraffin embedding. Sections were then cut and stained with hematoxylin and eosin using standard procedures. When required, special stains such as PAS and Recticulin and immunohistochemistry using monoclonal antibodies by PAP technique, were performed. The histological characterization of ovarian tumours

was done according to the WHO classification of 1995[8].

Results

Of 855 ovarian tumors, 506 (59.18%) were benign, 28 (3.27%) were borderline and 321 (37.54%) were malignant. They were subdivided into 5 major categories: Surface epithelial-stromal tumours 543 (63.50%) cases, Germ cell tumours 232 (27. 13%) cases, sex cord-stromal tumours 50 (5.84%) cases (Tables 1,2 and 3).

Table 1. Breakup of 543 surface epithelial tumours in our study into benign and malignant categories.

Histological Types	No.	%
Benign Tumours	293	53.95
1. Serous Cystadenoma	159	29.28
2 Serous Cystadenofibroma	38	6.99
3. Mucinous Cystadenoma	92	16.94
4. Brenner Tumour	4	0.73
Borderline Tumours	28	5.15
1. Borderline Serous Tumour	14	2.57
2. Borderline Mucinous Tumour	14	2.57
Malignant Tumours	222	40.88
1. Serous Cystadenocarcinoma	107	19.70
2. Mucinous Cystadenocarcinoma	55	10.12
3. Endometrioid Carcinoma	42	7.73
4. Clear Cell Carcinoma	7	1.28
5. Malignant-Mixed Mullerian Tumour	1	0.18
6. Undifferentiated (poorly differentiated Carcinoma	9	1.65
7. Pseudomyxoma Peritonei	1	0.18

Table 2. Breakup of 232 germ cell tumours in our study into benign and malignant categories.

Histological types	No.	.%
Benign Tumours	**186**	**80.17**
1. Benign Cystic Teratoma (Dermoid Cyst)	178	76.72
2. Struma Ovarii	8	3.44
Malignant Tumours	**46**	**19.82**
1. Dysgerminoma	23	9.91
2. Yolk Sac Tumour	8	3.44
3. Embryonal Carcinoma	2	0.86
4. Choriocarcinoma	1	0.43
5. Malignant Teratoma	6	2.58
6. Mixed Germ Cell Tumour	6	2.58

Table 3. Breakup of 50 sex cord-stromal tumours in our study into benign and malignant categories.

Histological Types	No.	%
Benign Tumours	26	52
1. Fibroma	15	30
2. Thecoma	8	16
3. Sertoli-Leydig cell tumour	2	4
4. Sclerosing Stromal tumour	1	2
Malignant Tumours	24	48
1. Granulosa Cell tumour	24	48
- AGCT	21	87.5*
- JGCT	3	12.5*

* of granulosa cell tumours.

The fourth category included tumours which were not specific to the ovary- there were 9 (1.05%) such tumours and included 7 cases of lymphoma and 1 case each of leukemia and benign leiomyoma.The fifth category was of 21(2.45%) of metastatic tumors of the ovary. The 5 commonest benign tuniours were benign cystic tcratonia (35.17% of all benign tumours), serous cystadenoma (31.42%), mucinous cystadenoma (18.18%), scrous cystadenofibroma (7.5 1%) and fibmina (2.96% of all benign tumours). The Commonest malignant tumours were serous cystadenocarcinoma (33.33%), mucinous cystadcnocarcinoma (17.13%), endoinetrioid carcinoma (13.08%), granulosa cell tumour (7.47%) and

dysgenninoma (7.16%). the majority of patients with begin tumors were younger than 40 years (75%) and malignant tumors older than 40 years(59%) of age (Tables 4 and 5).

Table 4. Age distribution of the five commonest benign tumours in our study (n=506).

Age Group (years)	Benign Cystic Teratoma (178)	Serous Cystadenoma (159)*	Mucinous Cystadenoma (92)**	Serous Cystadeno-fibroma (38)**	Fibroma (15)
0-9	2	-	-	-	1
10-19	8	5	3	-	-
20-29	78	48	25	14	4
30-39	60	47	30	9	3
40-49	19	32	11	7	4
50-59	8	10	10	2	1
60-69	3	1	4	2	1
70+	-	5	3	-	1
Total	178	148	86	34	15

*Age known in 148 cases.
**Age known in 86 cases.
***Age known in 34 cases

Table 5. Age distribution of the five commonest malignant tumours in our study (n=349).

Age group (Years)	Serous Cystadeno-carcinoma (107)*	Mucinous Cystadeno-carcinoma (55)**	Endometrioid carcinoma (42)***	Granulosa Cell Tumour (24)	Dysger-minoma (23)
0-9	-	-	-	-	1
10-19	1	-	-	2	8
20-29	7	8	4	3	11
30-39	23	17	5	5	2
40-49	27	8	12	2	-
50-59	21	10	7	6	1
60-69	20	5	7	5	-
70+	4	2	2	1	-
Total	103	50	37	24	23

*Age known in 103 cases.
**Age known in 50 cases.
***Age known in 37 cases

Discussion

Ovarian cancers rank among the ten commonest cancers in Pakistani women. Their ranking varied from second to fifth in various Pakistani studies[9-12]. The number of cases reported in different series ranged from 61 to 285[3,14-17]. The present series reports 855 cases of malignant ovarian tumors.
A comparison of the salient features of the results of our study with other Pakistani studies is presented in Tables 6 and 7.

Table 6. Relative frequencies of the five commonest benign ovarian tumours in our study compared with other local studies.

Type	Saeed (14)	Muzaffar (15)	Jamal (16)*	Zaman (17)	Present study
Bengin Cystic Teratoma	38.09%	39.74%	-	30.35%	35.17%
Serous Cystade-noma	38.09%	17.94%	16.49%	42.85%	31.42%
Mucinous Cystade-noma	19.04%	33.33%	7.21%	17.85%	18.18%
Serous Cystade-nofibroma	-	-	-	3.57%	7.51%
Fibroma	-	-	-	1.78%	2.96%

*11 tumours grouped together as 'miscellaneous' included Benign Cystic Teratoma, Cystadenofibroma, Fibroma etc.

Table 7. Relative frequencies of the five commonest malignant ovarian tumours in our study compared with other local studies.

Type	Saeed (14)	Muzaffar (15)	Jamal (16)	Jamal (3)	Zaman (17)	Present study
Serous Cystade Nocar-cinoma	27.5%	27.58%	38.46%	30%*	15.90%	30.65%
Mucinous Cystadeno-carcinma	25%	48.27%	23.07%	45%*	36.36%	15.75%
Endrome-trioid carcinoma	-	-	-	5%*	4.54%	12.03%
Granulosa Cell Tumor	-	-	-	-	15.90%	6.87%
Dysger-ninoma	-	-	-	3.06%**	13.63%	6.59%

*of all malignant epithelial ovarian tumours.
**of all malignant ovarian tumours.

Similar to Western data[7,18,19] and other Pakistani studies[3,14,15,17], surface epithelial-stromal tumours comprised the major histologic type. Serous cystadenocarcinoma was the commonest of the malignant surface epithelial - stromal turnours followed by mucinous cystadenocarcinoma and endometrioid carcinoma. However, in sonic local studies[15,17], mucmous cystadenocarcinoma was the commonest malignant surface epithelial-stromal tumour followed by serotis cystadenocarcinoma. It seems that mucinous turnouts are more common in our population as compared to the West where endometrioid carcinoma ranks second behind serous cystadenocarcinoma[7,18,19] In one of the local studies[17], endometrioid carcinoma trails even behind granulosa cell trnnour among malignant ovarian tumours. The mean age of patients with benign surface epithelial ¬stroinal tumours in our study was 30.39 years while that of malignant surface epithelial - stromal tumours was 43.75 years. However, the majority of borderline and invasive mucinous tumours were below 40 years of age suggesting that malignant inucmous turnouts may occur in a younger age group in our population. Only 42.02% patients were 40 years or older. This finding contrasts with Western data, which reports that the majority of borderline and malignant rnucinous turnouts occur in the 4th to 7th decade of life[19]. In contrast, 67.76% of borderline and malignant serons tumours and 76.19% of endornetrioid carcinoma patients were 40

years or older.

Germ cell turnouts comprised 27:13% of all ovarian turnouts in our series, which is higher than the 15-20% incidence rate reported in Western data[18]. Malignant germ cell tumours comprised 14.02% of all primaiy ovarian malignancies in our study. This is significantly higher than the 3.5% reported in the Western population[18] Jamal et al[3]. had also reported a rate of 3.6% while. Muzaffer et al[15]. reported a rate of 6.89% for malignant germ cell tmnours. However, in Zaman's series[17], malignant germ cells turnouts comprised 20.93% of all primary malignant tumours.

Memo and Jaffe[1] had reported that germ cells turnouts account for nearly 60% of all ovarian neoplasms in women under 20 years of age. Our findings were similar, with germ cell tumours comprising 58.33% of all ovarian tumours in-patients below 20 years of age. The mean age of benign germ cell tuinours in our, study was 32.27 years. However, the 8 patients with strurna ovarii had a mean age of 47.87 years; seventy seven percent of patients with benign cystic teratorna were bctween 20 and 39 years of age. Western data also indicate that the peak incidence of benign cystic teratorna is in the third decade[20] The mean age of malignant germ cell tumours in our study was 22 years. This finding corresponds to the published data[21]. as 82.60% cases of dysgenninoma in our series were., between 10 and 29 years of age.

The mean age of sex cord-stromal turnouts in our series was 37.09 years for benign tumours and 43.83 yeats for malignant turnouts. The metastatic tumours in our study had a mean age of 40.94 years. This large series further clarifies the pattern of ovarian neoplasms in Pakistan.

According to our study, surface epithelial-stromal turnouts are the commonest types of ovarian turnouts; Benign cystic teratoma is the commonest benign tumour (35.17% of all benign tuniours), while serous cystadenocarcinoma is the commonest malignant tumour (33.33% of all malignant turnouts). Borderline and malignant mucinous tumours appear to be more common and occur in a younger age group in our population as compared to the West. Malignant gem cell tumours also appear to be nore common in our population.

References

1. Merino MJ, Jaffe G Age contrast in ovarian pathology. Cancer, (Supplement) 1993; 71: 537-44.

2. National Center for Health Statistics, Division of Vital Statistics (Provisional Data). Hyatsville, MD. 1989.

3. Jamal S. Malik IA Ahmad M, et al. The pattern of malignant ovarian turnouts. A study of 285 consecutive cases at the Armed Forces Institute of Pathology, Rawalpindi Pak. 3. Pathol, 1993; 4: 107-10.

4. Yancik H. Ovarian Cancer. Age contrasts in incidence, histology, disease stage at diagnosis, & mortality. Cancer (supplements), 1993; 71 517-23.

5. Scully RE. Turnouts of the ovary & maldeveloped gonads. Atlas of tumour Pathology. 2nd series, Fascicle 16. 1979. Washington, DC., Armed Forces Institute of Pathology, 1979.

6. Piver MS, Baker TR, Jishi ME et al. A report of 658 families from the Gilds Radner Familial Ovarian Cancer Registry, 1981-1991. Cancer, 1993; 71: 582-88.

7. Female Reproductive System. In Rossi J (ed): Ackerman's Surgical Pathology. Sixth Edition. ST. Louis Mosby, 1996, p. 1475.

8. WHO Histological Classification of Ovarian Tumours, Geneva, WHO, 1995.

9. Khan SM, Gillani J, Nasreen S. et al Cancer in north west Pakistan and Afghan refugees J. Pak. Med, Assoc. 1997; 47 122-24.

10. Ahmad M, Khan AN, Mansoor A. The pattern of malignant turnouts in Northern Pakistan. J. Pak. Med. Assoc. 1991:41 270-73.

11. Ahmad J, Hashmi MA, Naveed IA, et al. Spectrum of malignancies in Faisalabad: 1986-90. Pak. J pathol., 1992; 3: 103-10.

12. Jafarey NA. Zaidi SHM. Cancer in Pakistan J. Pak. Med. Assoc. 1987; 37:178-83.

13. Bhurgri Y, Bhurgri A, Hasan SH, et al. Cancer incidence in Karachi, Pakistan: first results from Karachi Cancer registry. Int. J. Cancer, 2000; 85:325-29.

14. Saeed M. Khawaja K. Rizwan 1, et al. clinicopathological analysis of ovarian tumours. J. Pak. Med. Assoc. 1991; 41: 161-64.

15. Muzaffar M, Malik IA, Ashraf S A clinicopathological study of 107 ovarian turnouts. J. Pak. Med Assoc. 1987; 37: 194-97.

16. Jamal S. Quddusi H, Mehmood A. A clinmicopathalogy analysis of 110 ovarian tumoura Specialist, Pak. J. Med. Sci., 1997; 14: 19-23.

17. Zaman S. Histological Pattern of ovarian Neoplasms. A dissertation in partial fulfilment of the requirement for FCPS II, 1996.

18. Crum CP. The Female Genital Tract In Cotran RS, Kumar V, Collins T (eds.): Robbins Pathologic Basis of Disease, Sixth Edition, Philadelphia, W,B Saunders Company. 1999. p. 1068.

19. Russel P. Surface epithelial- stromal tumour of the ovary. In Kurman RJ (ed.): Blaustein's Pathology of the Female Genital Tract, Fourth Edition London Springer Verlag, 1994, p. 763.

20. Koonings PP. Campbell K, Mishell DR. et al. Relative frequency of primary ovarian neoplasms: a 10 year review. Obstet Gynecol., 1989; 74:921-26.

21. Talerman A. Germ cells turnouts of the ovary. In Kurman RJ (ed.): Blaustein's Pathology of the Female Genital Tract. Fourth Edition, London. Springer-Verlag, 1994, p. 853.