Cytohistomorphological study of ovarian tumours

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Summary : A total of 50 cases of ovarian tumours were taken for cytological and histological study. Of these 39 (78%) were benign and 11 (22%) were malignant. Serous cystadenoma was found to be the commonest (46%) tumour, followed by mucinous cystadenoma (20%). Majority of tumours belonged to age group 31-40 years (36%). Vague pain and discomfort was the commonest symptom observed in 92% patients. In peritoneal fluid, positive cytology was found in 50% cases of both benign and malignant tumours. Mesothelial cells, histiocytes and inflammatory cells were common component in aspirates irrespective of cytological diagnosis. In ovarian cyst fluid positive cytology was found in 53% cases (51.3% in benign group while 62.5% in malignant group). Imprint smears showed 82.22% positive cytology (76.5% in benign while 100% for malignant tumours).

Introduction

The ovary after the uterus is the second most common site for development of gynaecological malignancy. But unlike cervix and uterus it is not clinically easily accessible and therefore easy screening method for detecting ovarian neoplasm remain to be evolved since present day methods are far from adequate. Ovarian tumours exfoliate cells into the peritoneal cavity which are like those seen in tumour or suggestive of tumour. Morphological examination of cells in the peritoneal fluid can assist the physician to detect ovarian neoplasms in the early stages of development and to differenttiate benign from malignant neoplasm. In the imprint technique, direct impressions are made of the surface of tumour section which permits more detailed assessment of intracellular structure. Fluid and imprint smears from the tumour can be used to make spot diagnosis before definitive surgery in young patients.

Aim of this study is

1. To study cytologic features (fluid cytology and imprint smear) of ovarian tumour cases.

2. To correlate the finding of cytology with histopathological diagnosis.

Material & Method

Study was conducted on 50 cases of ovarian tumours operated in J.N. Medical College during the period 1994-95. The detailed clinical history with complete physical examination of the patient was noted. At the time of operation gross appearance of tumour, quantity and colour of fluid, solid or cystic nature was noted. Peritoneal fluid/Ascitic fluid or peritoneal lavage fluid was collected at the time of laprotomy by 5 ml sterile syringe into a vial of EDTA from the pouch of douglas.

Cyst fluid was obtained at the time of laparotomy by puncturing the cyst with a sterile syringe and needle. 5 ml was collected in EDTA vial. In solid tumours cells were aspirated in the same way as in fine needle aspiration.

The fluid obtained was centrifuged at 2000 rpm for 15 minutes and supernatant thrown off. Deposit was removed and transferred to clean glass slide.

For imprint smears, specimen was cut through with a sharp knife and freshly cut surface was pressed against glass slide and fixed in alcohol.

After fixation the slides were stained by one of the following methods.

A. Hematoxylin & Eosin method: Cell cytoplasm stained pink, and nucleus blue.
B. Papanicolou staining method: Cell cytoplasm stained reddish pink blue or green and nucleus blue.

Observations

A total of 50 cases of ovarian tumours were studied out

of which 39 (78%) were benign and 11 (22%) were

Table I

S.No.	Types of Cases (Histopathological diagnosis)	No. of cases	Percentage	Percentage among benign
	Benign			
1.	Serous tumours	23	46%	58.9%
a.	Serous Cystadenoma	22		
b.	Surface Papilloma	1		
2.	Mucinous cystadenoma	10	20%	25.6%
3.	Corpus Luteal cyst	1	2%	2.6%
4.	Endometriotic cyst	1	2%	2.6%
5.	Cystic teratoma	4	8%	10.3%
		39	78%	Percentage among Malignant
	Malignant			
1.	Serous Cystadeno carcinoma	4	8%	36.4%
2.	Mucinous cystadeno carcinoma	2	4%	18.2%
3	Dysgerminoma	3	6%	27.3%
4	Malignant Teratoma	1	2%	9.1%
5	Krukenberg tumour	1	2%	9.1%
	Total	11	22%	

Table II

Age Distribution in Ovarian Tumours

Age group In years	No. of Cases	Percentage	Benign		Malignant	
			No.	%	No.	%
10-20	7	14%	7	14%	0	0
21-30	13	26%	13	26%	0	0
31-40	18	36%	13	26%	5	10%
41-50	8	16%	5	10%	3	6%
51-60	2	4%	0	-	1	2%
61-70	1	2%	0	-	1	2%
71-80	0	0	0	0	0	0
81-90	1	2%	0	-	1	2%

malignant. Distribution of different type of tumours is shown in table 1.

Age : Age distribution as observed is shown in table II Majority of the tumours were in age group 31-40(36%). Average age for benign tumours was 32.07 while for malignant was 40 - 55 years.

Symptomatology:- Pain was the commonest complaint present in 46(92%) cases among which 32(64%) had vague pain and discomfort 14(28%) had marked pain. Different symptoms observed are shown in Table III.

Table III

Symptomatology of ovarian tumours

Symptoms	No. of cases	Percentage	Benign		Malignant	
			No.	%	No.	%
Severe pain in abdomen	14	28%	8	16%	6	12%
Vague pain in abdomen & bloating	32	64%	32	64%	0	-
Lump in abdomen	33	66%	28	56%	5	10%
Distension of abdomen	12	24%	8	16%	4	8%
Infertility	10	20%	9	18%	1	2%
Menstrual Irregularity	17	34%	14	28%	3	6%
Urinary complaints	4	8%	2	4%	2	4%
Constipation	7	14%	5	10%	2	4%
Post menopausal bleeding	3	6%	1	2%	2	4%

Table IV

Analysis of Peritoneal fluid cytology in relation to histopathological diagnosis.

S.No. Types of Cases	No. of Cases	Peritoneal fluid Taken in no. of Cases	Positive	Negative	Percent positivity (28 cases)
Benign					
1. Serous tumours	23	11	6	5	21.4%
2. Mucinous cystadenoma	10	7	2	5	7.2%
3. Corpus luteal cyst	1	-	-	-	-
4. Endometriotic cyst	1	1	1	-	3.6%
5. Cystic teratoma	4	1	1	-	3.6%
	39	20	10	10	50%
Malignant					
1. Serous Cystadenocarcinoma	4	1	-	1	-
2. Mucinous cystadenocarcinoma	2	2	-	2	-
3. Dysgerminoma	3	3	3	-	10.7%
4. Malignant teratoma	1	1	-	1	-
5. Krukenberg tumour	1	1	1	-	3.6%
	11	8	4	4	50%
Total	50	28	14	14	50%

Peritoneal fluid cytology : Cytology was taken as positive when it corresponded to histopathological diagnosis. It was, found to be postive in 50% cases in both benign and malignant group as shown in table IV.

Ovarian Cyst fluid Cytology : Cyst fluid was positive in 53.3% cases. Among the benign group positivity of 51.35% and 62.5% in malignant group was observed as shown in table V.

Imprint Cytology : Cytology was found to be positive in 82.2%. Positivity was 76.5% in benign group as show in table IV (A) and 100% in malignant group as shown in table VI(B). Cell types observed were almost identical to those in histological specimen.

Discussion

Incidence of 74.3% and 25.7% for benign and malignant

Table V

Analysis of Ovarian cyst fluid cytology in Relation to histopathological diagnosis

S. No.	Type of Tumour	Ovarian cyst Fluid taken In no. of Cases	Positive	Negative	Percentage Positivity (in 45 cases)
	Benign				
1.	Serous tumours	21	9	12	20%
2.	Mucinous cystadenoma	10	5	5	11.11%
3.	Corpus luteal cyst	1	-	1	-
4.	Endometriotic cyst	1	1	-	2.22%
5.	Cystic teratoma	4	4	-	8.88%
		37	19	18	51.35%
	Malignant				
1.	Serous Cystadenocarcinoma	4	3	1	6.66%
2.	Mucinous Cystadenocarcinoma	2	1	1	2.22%
3.	Dysgerminoma	-	-	-	-
4.	Malignant teratoma	1	-	1	-
5.	Krukenberg tumour	1	1	-	2.22%
		8	5	3	62.5%
	Total	45	24	21	53.33%

Table VI

Analysis of imprint cytology in relation to histopathological diagonosis

A. Benign tumours

S.No.	Types of Tumour	Imprint Taken in No of cases	Positive	Negative	Percentage positivity in 45 imprint)
1.	Serous tumours	19	15	4	33.3%
2.	Mucinous cystadenoma	9	6	3	13.3%
3.	Corpus Luteal Cyst	1	1	-	2.24%
4.	Endometriotic cyst	1	-	1	-
5.	Cystic teratoma	4	4	-	8.88%
	Total	34	26	8	76.5%

B. Malignant Tumours

S. No.	Tupes of Tumour	Imprint Taken in No of case	Positive	Negative	Percentage positivity in 45 imprint
1.	Serous Cystadenocarcinoma	4	4	-	8.8%
2.	Mucinous cystadenocarcinoma	2	2	-	4.4%
3.	Dysgerminoma	3	3	-	6.6%
4.	Malignant teratoma	1	1	-	2.2%
5.	Krukenberg tumour	1	1	-	2.2%
	Total	11	11	-	100%
	Total	45	37	8	82.2%

tumours was reported by Bhuvanesh and Logamval (1978), while Rajgopalan et al (1982) reported incidence of 84.63% and 15% respectively for benign and malignant tumours as compared to 78% and 22% in present study.

Average Age for benign tumour was found 32.07 years and for malignant 40.55 years while Portuondo et al (1984) found 36.4 years and Ong et al (1978) 34.2 years for benign tumours. Pearse and Behrman (1954) reported average age for cancer of ovary as 54 years.

In this series 66.6% of malignant tumours had pain of varying degree while Montgomery (1948) reported 59.3% and Kent & Mckay (1960) 57% incidence. Mass in abdomen was next common symptom present in 66% cases in this study in comparison to 50% reported by Kent & Mckay (1960) and 48.36% by Rajgopalan et al (1982).

Creasman et al (1971) reported 53.5% and Yoshimura et al (1984) 49% positive peritoneal fluid cytology comparable to 50% observed in this study.

Positive ovarian cyst fluid cytology of (53.33% in benign group and 62.5% in malignant group) was observed in this study. Kjellgren et al (1971) observed 82% accurracy. Kjellgren et al (1971) reported 90% accurracy for malignant tumours. Material aspirated from benign neoplasm contained few cells whereas malignant neoplasms were much more cellular. Angstrom et al (1972) observed the same.

Imprint cytology was found to be positive in 82.22% cases (76.5% in benign group and 100% in malignant group). Mavec (1967) reported 93%, Hayashida et al (1966) 93.2%, Sakai et al (1969) 95.5% and Aust et al (1971) 96% accuracy. In no case there was misinterpretation of tumour. No false positive or false negative tumour diagnosis was observed. In imprint smear cell types observed were almost identical to those in histological specimens. Sensitivity of cytological diagnosis was observed to be 0.87. Imprint smears were the most accurate in diagnosing.

Object of diagnosing specimens at the time of surgery by cytomorphological study is to define a therapeutic decision quickly. In most of our hospitals there is no provision for frozen section. Imprint smear can be used to make spot diagnosis before definitive surgery in young patients.

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