OVARIAN TUMOURS IN CHILDHOOD AND ADOLESCENCE

by

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Ovarian tumours in childhood and adolescence provide real problems in diagnosis and management because the condition is often obscure and may not come into consideration before some complications arise or malignancy supervenes. The symptoms are usually minimal and discomfort very little until they attain considerable size. The problem is often handled by a physician rather than a gynaecologist and this in itself may lead to illogical management. The malignant potential may often remain unrecognised and inadequate therapy advocated, whereas in other instances surgical procedures may be unnecessary radical in these young patients. At no other time in life does prognostication and its therapeutic implications undergo more careful scrutiny than when related to these children and young adolescents whose physical development and future childbearing potential often depend upon careful conservation of ovarian tissue but whose life also depends on the proper eradication of the neoplasm when malignant. This study of ovarian tumours was undertaken to emphasise the incidence, variation and age distribution of the different tumour types, elaborate meaningful diagnostic criteria and to formulate some principles in the proper management of these young patients.

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Accepted for publication on 23-9-1974.

Material and Method

All patients upto the age of 19 years operated for ovarian tumour at Eden Hospital, Medical College, Calcutta during the 12 year period 1960-1971, were included in the study. The patients' records were analysed, histological sections reviewed to confirm the pathological diagnosis and follow up examination through December 1972 were noted.

Observations

A total of 272 cases of ovarian neoplasms were admitted during the study period, of which 57 were found in patients aged 19 years or less. Sixteen of them were malignant. Teratomatous tumours were most frequent, 12 being cystic benign teratoma and 1 solid malignant teratoma representing 22.8 per cent of the tumours in this study (Table 1).

Malignant ovarian tumours formed 28 per cent of the cases in the present study in contrast to widely varying incidence between 7 to 66 per cent (Table II).

The patients ranged in age from 4 to 19 years and the solid teratoma was present in a girl of 5 years (Table III).

Abdominal pain and pelvic mass were the main presenting feature in three fourths of the cases, followed by gastrointestinal symptoms, menstrual disorders and fever. Precocious puberty was present in 2 cases. (Table IV).

TABLE I
Distribution of Cases

Benign Tumours	Total cases	Upto 19 yrs	Malignant tumours	Total cases	Upto 19 yrs.
Benign teratoma (Dermoid)	43	12	Primary carcinoma	23	7
Cystadenomas	79	11	Dysgerminoma	15	6
Functional cysts	92	10	Solid teratoma	2	1
Endometriosis	8	2	Granulosa cell tumour	2	0
Tubercular	3	2	Mesonephroma	2	1
Others	1	4	Krukenberg tumour	2	1
	226	41		46	16

TABLE II
Relationship of Benign to Malignant Tumours

Author & Year	Benign	Malignant	Percentage
Mehta (1958)	2	4	66
Radmen & Karman (1960)	24	3	11
Groeber (1963) Collected series	213	50	19
Moore et al (1967)	147	11	7
Present series (1972)	41	16	28

TABLE III
Age Distribution

Tumours	0-6	7-12	13-19	Total
Benign				
Cystic teratoma	2	4	6	12
Cystadenoma	4	2	5	11
Functional cysts	–	–	10	11
Others	1	3	4	8
Malignant				
Primary carcinoma	2	2	5	9
Dysgerminoma	1	5	–	6
Solid teratoma	1	–	–	1

TABLE IV
Symptoms

Type of tumour	No.	Abdominal Pain	Abdominal Mass	Gastro-intestinal symptoms	Menstrual disorders	Fever	Precocious Puberty
Benign cystic teratoma	12	9	8	1	2	1	–
Serous cyst	3	2	2	1	–	–	–
Muminous cyst	8	7	7	3	1	1	–
Functional cyst	10	10	–	4	1	2	1
Endometriosis	2	2	1	1	1	–	–
Malignant	16	6	13	2	1	–	1
Others	6	4	3	1	1	1	–
Total	57	40	34	13	7	5	2

Abdominal mass was present in 70 per cent of the cases, more so in the malignant group and abdominal tenderness in 50 per cent. Pelvic mass could be felt in 60 per cent of the cases. (Table V).

TABLE V
Physical Findings

Type of tumour	No.	Abdominal mass	Abdominal Tenderness	Pelvic mass
Benign cystic teratoma	12	10	5	6
Serous cyst	3	3	2	1
Muminous cyst	8	7	5	5
Functional cyst	10	1	8	5
Endometriosis	2	1	2	2
Malignant	16	13	4	8
Others	6	3	3	3
Total	57	38	29	30

Pre-operative diagnosis made in 70 per cent.

For purpose of study, the cases could be grouped into 4 categories.

Teratomatous lesions were the most frequent representing 22.8 per cent of the tumours. The patients ranged in age from 4 to 15 years, abdominal pain and pelvic mass were present in 3/4th of the cases. The average diameter was 12 cm. and torsion noted in 50 per cent of the cases. Abdominal X-Ray revealed calcification in 58% of cases and helped in diagnosis.

Mucinous and serous neoplasms formed the second largest group. Four cases were in children below the age of 7 years and 7 between ages of 10 and 19 years. Abdominal enlargement followed by pain was the presenting symptom in these cases. Average diameter of the lesions were 18 c.m. and a preoperative diagnosis of ovarian tumour was made in 9 instances.

The third major group were formed by non-neoplastic functional cysts follicular in 7 and leuteal in 3 cases. All patients in this group were above 14 years of age and 1 presented with Stein Leventhal syndrome. Pain was present in 85% of the cases followed by gastrointestinal symptoms and fever. Abdominal tenderness was present in 8, abdominal mass in 1 and pelvic mass in 4 cases. The average cyst size was 7.5 c.m. and a pre-operative diagnosis could be made only in 50 per cent cases. A presumptive diagnosis of appendicitis was the commonest mistake.

In the malignant group, all the cases of dysgerminoma presented with abdominal pain and swelling, 5 were above 14 years and 1 of 8 years. All cases of solid primary carcinoma presented with ascites and abdominal mass.

The management of ovarian tumours in these age group demands considerable caution and judgment. Unilateral ovariotomy was performed in all benign cystic teratomas and cystadenomas without any subsequent complications. Unilateral oophorectomy was performed in 7 and resection of cysts in 3 cases of non-neoplastic functional cysts without recurrence.

Abdominal panhysterectomy was performed in the patient with solid malignant teratoma followed by radiotherapy but death occurred after 1 year.

Of the 6 cases of dysgerminoma, 3 had unilateral ovariotomy of which 2 are alive and 1 died after a radical operation following relaparotomy. Radical operation was performed followed by radiotherapy in 3 cases of which 2 are alive.

All the 7 cases of primary solid adenocarcinoma had radical operation followed by radiotherapy in 5 and chemotherapy in 2 but all died within 2 years of therapy. The patient with mesonephric carcinoma died within 6 months and that with solid teratoma after one year of radical operation and radiotherapy. The case with Krukkenberg tumour survived 3 years after operation (Table VI and Table VII).

Comments

Early recognition and prompt treatment are of paramount importance when one deals with Ovarian tumours in children and in adolescence. Because the condition is obscure and often not kept in mind, it may not be diagnosed before some complication supervenes. Lower abdominal pain, abdominal or pelvic mass, precocious puberty, gastrointestinal upset and abdominal tenderness are im-

TABLE VI
Management of Ovarian Tumours

Type of Tumour	No.	Unilateral Oophrectomy	Ovarian cystectomy	Wedge Resection	Panhystrectomy	Radiotherapy/ Chemotherapy
Benign cystic teratoma	12	12	–	1	–	–
Serous & mucinous cysts	11	11	–	–	–	–
Functional cysts	10	7	2	1	–	–
Endometriosis	2	1	1	–	–	–
Malignant	16	3	–	–	13	13
Others	6	3	2	1	–	–
Total	57	37	5	2	13	13

TABLE VII
Results of Treatment in Malignant Ovarian Tumour

Tumour	Treatment		Alive	Died within
Dysgerminoma (6)	Unilateral Ovariotomy	(3)	2 } 5 yrs.	1 yr. (1)
	Panhysterectomy & Radiotherapy	(3)	2	2 yrs. (1)
Solid primary (7)	Panhysterectomy + Radiotherapy	(5)		
	E + Chemotherapy	(2)	–	2 years
Mensonephric carcinoma (1)	Panhysterectomy & Radiotherapy		–	6 months
Krukunberg tumour (1)	-do-		Alive 3-5 yrs.	
Solid teratoma	-do-		–	1 year

portant clues suggesting the presence of an ovarian tumour. The commonly mistaken diagnosis of acute appendicitis can often be excluded by demonstrating a pelvic mass on rectal examination preferably under anaesthesia aided by a flat plate X-Ray of abdomen and ancillary laboratory aids.

One third of the tumours in the series were of germ cell origin compared to 67 per cent reported by Groeber (1963) and 60 per cent by Abell *et al,* (1965).

The benign cystic teratomas are by far the most frequent specific type of ovarian neoplasms encountered in childhood and adolescence being, 22.8 per cent in this series compared to 38 per cent (Abell *et al,* 1965), 61 per cent (Groeber, 1963) and 50 per cent (Radmen, 1960), whereas it comprises only 10 to 20 per cent in adults (Kent, 1960). Bilateral tumours are rather rare in this age group and none was present in this series, whereas in adults it is bilateral in 25% of cases.

The main risk with the benign cystic teratoma is its tendency to rupture at operation with chemical peritonitis rather than its potential malignancy and as such behooves the surgeon to remove these tumours intact.

The solid teratoma which contains more primitive elements is more likely to be malignant and are very often fatal in children.

The other benign lesions noted in this survey were the serous and Pseudomucinous cystadenomas. They are rare in the very young and the majority were above 10 years of age. These cysts are usually unilateral and their malignant potential low in this age group and none proved to be malignant in the present survey.

Non-neoplastic functional cysts, specially follicular and Luteal cysts were present in 18 per cent in this series and the most common preoperative diagnosis was acute appendicitis, particularly when on the right side. It is difficult to justify oophorectomy for functional ovarian cysts and resection of the cyst after opening the cyst at the time of surgery to ensure the absence of malignant disease is justifiable.

Malignant ovarian tumours occurred in all age levels and formed 28 per cent of ovarian neoplasms in this series compared to 7 per cent (Moore *et al,* 1967), 11 per cent (Radmen *et al,* 1960) 66 per cent (Mehta, 1958) and 50 per cent in other collected surveys.

Of these, the germinomas are a relatively benign form of cancer and in this series, 4 of 6 patients with dysgerminoma were alive and well after unilateral ovariotomy in 2 cases and radical operation in other 2 cases. The neoplasm is usually unilateral and often reaches a large size before metastasizing. Five were above 14 years and 1 presented with dysplastic gonads. Conservative survey may be initially indicated in a young patient with unilateral, mobile and encapsulated dysgerminoma. The sole purpose of the partial operation is to take a calculated risk to preserve fertility and ovarian function of the unaffected side and in this light, postoperation radiotherapy should be withheld.

Primary adenocarcinoma, solid malignant teratoma and mesonephric carcinoma on the other hand carries a poorer prognosis and none survived after 2 years even after radial surgery followed by chemotherapy or radiotherapy in this series.

Early recognition and proper planning of treatment is imperative when one deals with ovarian tumours in children and adolescence. Intelligent conservation of ovarian function and fertility should be accomplished whenever feasible with a

calculated risk and at the same time not hesitating to undertake a radical procedure if occasion demands.

Summary and Conclusion

1. During the 12 years period 1969-71, 272 cases of ovarian neoplasms were admitted in Eden Hospital, Medical College, Calcutta. Fifty seven ovarian tumours were found in patients aged 19 years or less of which 16 were malignant (28 per cent).

2. About 30 per cent of the tumours were of germ cell origin, either benign or malignant.

3. The benign cystic teratoma is by far the most common tumour with an incidence of 22.8 per cent and its more primitive variant, the solid teratoma is only 1.7 per cent. None of them were bilateral.

4. The next most frequent tumour was serous or mucinous cystadenomas the majority in children above the age of 10 years with a low potentiality for maliggnancy.

5. The third major group were formed by non-neoplastic functional cysts affecting the follicle or corpusluteum (18 per cent) mostly in patients above 14 years of age presenting with pain, fever and gastrointestinal symptoms and mistaken for acute appendicitis.

6. In the malignant group, comprising 28 per cent of the tumours, were dysgerminomas, primary solid adenocarcinoma, solid teratoma, mesonephric carcinoma and Krukenberg tumour occurring at all age levels. Except dysgerminomas which appeared to be a relatively benign form of cancer, mortality was high in all the other malignancies encountered in this series.

7. The clinical diagnostic criteria in each tumour types have been discussed and early recognition of these tumours stressed.

8. The proper planning in the management of these patients is discussed with intelligent conservation of ovarian function whenever feasible at the same time resorting to radical measures when occasion demands and malignancy proved beyond doubts.

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