International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Nayanashree V et al. Int J Reprod Contracept Obstet Gynecol. 2025 Apr;14(4):1195-1199
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20250861

Original Research Article

A hospital based analytical study of ovarian neoplasms among adolescent girls with clinicopathological correlation

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Received: 31 January 2025
Accepted: 04 March 2025

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ABSTRACT

Background: To study the prevalence of different histopathological types of ovarian tumors and their management, and clinic pathological correlation among girls of age 8-19 years.
Methods: A retrospective analytical study conducted among girls of age 8-19 years, diagnosed with ovarian tumour at Sri Chamarajendra Hospital from 2016-2022. Demographic data, age of presentation, size of tumour, histopathological type of tumor, type of surgery performed were analysed and correlation between radiological and histopathological findings were noted.
Results: Among 42 girls aged between 8-19 years of age who presented with an ovarian neoplasm, in the study period of 7 years, 57% were the age group of 17-19 years, ovarian cystectomy was done in 17 (44%) patients, unilateral oophorectomy in 16 (41%) and salpingo-oophorectomy in 6 (15%). Histopathology reports showed that majority (88%) of the tumours were benign in nature, of which serous cystadenoma was the most common 14 (33%) and 3 (7%) malignant ovarian neoplasm. Radiological findings showed positive correlation with histopathology in the present study.
Conclusions: Ovarian neoplasm in adolescent girls is rare but distressing, diagnosed on high index of suspicion. Early diagnosis and surgery are vital, aiming fertility preservation and female gonad preservation.

Keywords: Ovarian neoplasm, Adolescent, Histopathology, Malignant, Oophorectomy, Laparotomy

INTRODUCTION

Adolescence is the age of physical, psychological, sexual, social changes among girls aged 8-19 years. Health issues among adolescents may lead to tremendous physical, social, and psychological stress among adolescent girls. The most common is menstrual symptoms, followed by a variety of benign, borderline, malignant ovarian tumors that are observed in <2% of adolescents.[1] Ovarian neoplasm are the 3rd most common cancer among Indian women and the 9th most common cause of death due to cancers (GLOBOCAN2020Factsheet).[2] Ovarian tumors are of varying histological patterns classified as epithelial tumors, mesenchymal tumors, mixed epithelial and mesenchymal tumors, sex cord stromal tumors, germ cell tumors, miscellaneous tumors, tumor like lesions In the adolescent age group, most of the ovarian tumours are of germ cell origin. Although the majority of these ovarian tumors are benign, a small number (0.2%) are malignant.[3] However, these indolent malignant tumors are aggressive when diagnosed. Thus, the optimal goal of management is to promote an excellent outcome while reducing morbidity and preserving fertility among the adolescent.

METHODS

Study type

The study was retrospective analytical study.

Study place

The study was conducted at Sri Chamarajendra Teaching Hospital attached to Hassan Institute of Medical Sciences, Hassan, Karnataka.

Data collection

Data were collected from the medical records of adolescent girls (8-18 years of age) who were suspected for ovarian neoplasms at Sri Chamarajendra Teaching Hospital, from 2015-2022.

Data from patient's records- such as demographic data, age of presentation, symptoms, radiological investigation, histopathological type, treatment modality were collected and analyzed with Microsoft Excel sheet version 16.2. Results were tabulated using bar diagrams, pie charts. Pearsons's correlation coefficient was used to calculate correlation between radiological and histopathological diagnosis.

RESULTS

Age distribution

In the present study, about 42 adolescent girls were suspected with ovarian neoplasm in the study period of 7 years. A majority of patients, 24 (57%) diagnosed with ovarian neoplasm, belonged to age group of 17-19 years (Figure 1).

Symptoms

Menstrual irregularity was reported in 2% cases, acute abdomen in 14%, lump in lower abdomen 34%, anorexia and vomiting in 24%, heavy menstrual bleeding in 12% of the patients. A majority of patients presented with symptom of mass per abdomen, about 6 patients presented with pain abdomen, 1 case of Granulosa cell tumour presented with menstrual irregularity, and 6 were incidental findings (Table 1).

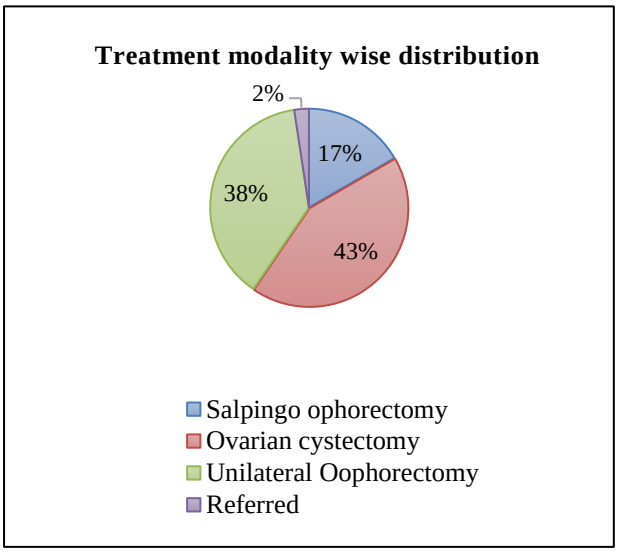

Figure 1: Distribution of cases according to treatment modality.

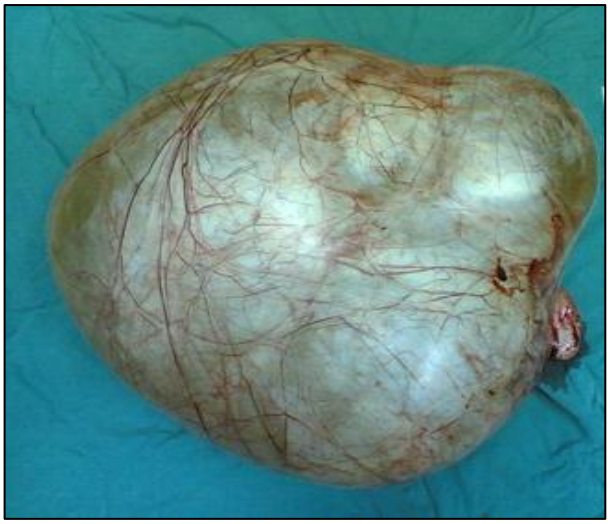

Figure 2: Ovarian serous cystadenoma.

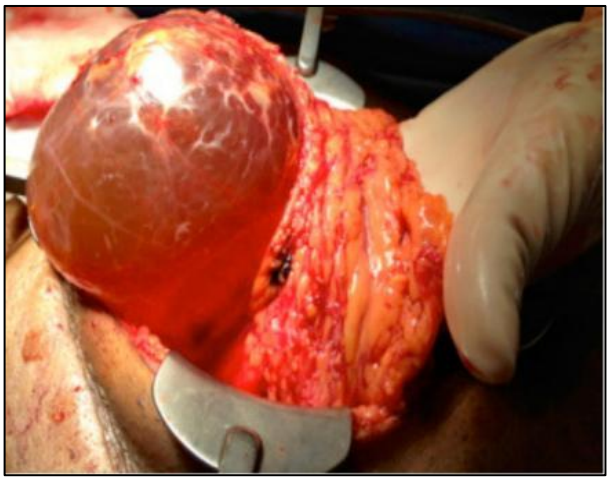

Figure 3: Mesenteric cyst.

Treatment modality among observed cases

On analyzing the treatment modality, 18 (43%) of patients underwent ovarian cystectomy, 15 (38%) unilateral oophorectomy, 7 (17%) salpingo-oophorectomy, 1 case of ovarian torsion presented as a twisted ovarian cyst for which Detorsion and sandwich ovarian suspension was done. 2 cases were referred to higher center, one was a bilateral serous cystadenocarcinoma which was preoperatively diagnosed and referred, and other was a case of serous cystadenocarcinoma which was referred post unilateral salpingo-oophorectomy.

Histopathological distribution of cases

On analyzing the histopathology reports, a majority of 39 (93%) of the tumors were benign in origin, of which serous cystadenoma constituted 14 (33%), Mature cystic teratoma 13 (31%), Mucinous cystadenoma 10 (24%) and Granulosa cell tumor 2 (5%) of the total cases. Of the malignant ovarian tumors, 2 cases were of serous

cystadenocarcinoma and 1 was a case of immature teratoma with MRKH syndrome.

Radiological distribution of cases

On analyzing the radiological reports, about 95% of the tumours were unilateral, and bilateral ovarian tumours 5%, 2.5% mature cystic teratoma and serous cystadenocarcinoma. About 34 (81%) of tumours were cystic, 6 (14%) were solid-cystic, 2 (5%) were solid in consistency. 24 (57%) of the ovarian masses were less than 10 cm in size, 12 (29%) were 10 to 15cm and 14% were more than 15 cm in size (Table 3). A case of bilateral serous cystadenocarcinoma presented with ascites. Torsion was noted in 2 cases of serous cystadenoma and 3 cases of mature cystic teratoma.

Statistical correlation between radiological and histopathology

There was a positive correlation between the radiological and histopathology finding, with Pearsons's correlation coefficient of 0.99. Radiological findings failed to diagnose a case of immature teratoma and a case of serous cystadenocarcinoma which were later diagnosed by histopathology (Table 4).

The case of serous cystadenocarcinoma was referred to higher centre and was lost to follow up and the case of immature teratoma is on a regular follow up with no further progression of the disease.

Table 1: Distribution of cases based on clinical symptoms.

S. no.	Symptoms	Number of patients	%
1	**Lump in abdomen**	14	34
2	**Acute pain abdomen**	6	14
3	**Menstrual irregularity**	1	2
4	**Incidental findings on examination**	6	14
5	**Heavy menstrual bleeding**	5	12
6	**Anorexia and vomiting**	10	24

Table 2: Distribution of cases based on histopathology.

Type of neoplasm	Cell of origin	Neoplasm	Number of patients	%
Benign	Epithelial	Serous cystadenoma	14	33
		Mucinous cystadenoma	10	24
	Germ cell	Mature cystic teratoma	13	31
	Sex cord stromal	Granulosa cell tumour	2	5
Malignant	Epithelial	Serous cystadenocarcinoma	2	5
	Germ cell	Immature teratoma	1	2

Table 3: Radiological findings of ovarian tumours.

Radiology findings	Benign			Malignant			Total	%
	Serous cystadenoma	Mucinous cystadenoma	Mature cystic teratoma	Granulosa cell tumour	Serous cystadenocarcinoma	Immature teratoma		
Unilateral/bilateral								
Unilateral	14	10	12	2	1	1	40	95
Bilateral	-	-	1	-	1	-	2	5
Consistency								
Solid	-	-	1	-	1	-	2	5
Cystic	12	10	9	2	-	1	34	81
Solido cystic	2	-	3	-	1	-	6	14
Size of tumour								
<10 cm	13	1	7	2	-	1	24	57
10-15 cm	1	6	5	-	-	-	12	29
>15 cm	-	3	1	-	2	-	6	14

Table 4: Correlation between radiological and histopathological finding

	Radiological finding	Histopathology
Benign	41	39
Malignant	1	3

DISCUSSION

Ovarian tumors in adolescent girls represent tumor with heterogeneous histopathologic types. The ovarian neoplasms may range over a wide spectrum of pathology from benign to highly aggressive malignant tumours. There were 42 cases of ovarian neoplasms in girls of age 8-19 years in the study period of 7 years. Most of the patients belonged to age group of 17-19 years similar to the study conducted by Lateefa et al.[3]

Ovarian masses in this age group may present as pain abdomen, mass per abdomen or abdominal distention, menstrual irregularities, or could even be an incidental finding. The common presenting symptoms in our study were mass per abdomen (34%) compared to the results of Ki et al where the presenting symptom was abdominal pain (47.7%), palpable abdominal masses (24.6%), incidental ultrasonographic findings (4.6%) and precocious puberty (6.2%).[4] However one case of granulosa cell tumor presented with menorrhagia in our study.

In the present study, about 18 (43%) of patients underwent ovarian cystectomy, 15 (38%) unilateral oophorectomy, 7 (17%) salpingo-oophorectomy, 1 case of ovarian torsion presented as a twisted ovarian cyst for which detorsion and sandwich ovarian suspension was done compared to the treatment modality in a study by Tanksale et al where ovarian cystectomy was done in 23 (71%) patients, unilateral oophorectomy in 3(9%) patients, bilateral oophorectomy with omentectomy in 1 (3%) patient and salpingo-oophorectomy in 1 (3%) patient.[5]

Ovarian neoplasms in adolescents are usually benign in nature as per literature. Even in our study we found that 93% of the cases were benign in nature compared to the results of Bren et al, who reported that 35% of all ovarian neoplasms in childhood and adolescent were malignant.[6] Most of the tumours were of epithelial origin (72%), this was in contrast to Ehren et al, who found that 60-85% of all the ovarian neoplasms in the pediatric age group in their study were of germ-cell origin.[7]

In our study, most of the tumours were cystic in consistency (81%) similar to the study by Kundu et al where 85.45% of masses were exclusively cystic.[8] Ovarian neoplasms with cystic appearance were mostly benign (97%). Ovarian torsion must always be kept in the differential diagnosis in young girls presenting with acute lower abdominal pain. The overall malignancy rate in torsion ovaries is low, ranging from 3.5 to 5.4%.[9] None of the 5 cases presented with torsion of the ovary proved to be malignant histologically in our study. Ascites was present only in one case, which was histologically serous cystadenocarcinoma.

Radiological findings showed a strong positive correlation with histopathology (r=0.99) in the present study similar to the results by Rathore et al and Anant et al.[10,11] Short coming of present study is, the retrospective nature of this study that restricted our access to biochemical parameters (tumor markers). Long term follow up was not possible in this study.

CONCLUSION

Ovarian neoplasms in adolescent girls are rare and mostly benign. Among adolescent girls, abdominal pain and mass per abdomen are the most common presenting complaint. So, the index of suspicion should be kept high and prompt investigations like ultrasound must be performed early to rule out adnexal masses with no mass palpated.

Though a majority of ovarian neoplasm are benign, the incidence of malignant ovarian neoplasms must always be a warning for follow up with histopathology and long-term follow-up. Radiological findings showed a very strong positive correlation with histopathology (r=0.99) in the present study. Early diagnosis and surgery are essential in aiming fertility preservation and female gonad preservation among adolescent girls.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Nayanashree V., Banapurmath STR, Paul N. A hospital based analytical study of ovarian neoplasms among adolescent girls with clinicopathological correlation. Int J Reprod Contracept Obstet Gynecol 2025;14:1195-9.