

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20232742>

Original Research Article

## Comprehensive review of adnexal masses in a tertiary care hospital

Betty Janice A.\*, Padma A.

Department of Obstetrics and Gynecology, Pondicherry Institute of Medical Sciences, Puducherry, India

**Received:** 18 November 2022

**Revised:** 22 June 2023

**Accepted:** 05 August 2023

**\*Correspondence:**

Dr. Betty Janice A.,

E-mail: [betyjanice@gmail.com](mailto:betyjanice@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Adnexal masses can be either be a physiological luteal cyst, a benign tubo-ovarian mass or a malignancy. The signs and symptoms along with tumour markers and imaging modalities are considered to differentiate between a benign and a malignant adnexal mass. Adnexal masses in pregnancy can be asymptomatic or can present with acute abdomen in cases of ectopic pregnancy and torsion. The aim was to study the prevalence of various histopathologic types of adnexal masses in different age groups.

**Methods:** This was a retrospective study carried out in the department of obstetrics and gynecology in a tertiary care hospital from May-2019 to April-2022. Women with sonographically diagnosed adnexal mass were evaluated. Data regarding ultrasound findings, tumour markers, RMI score and the management done were recorded from medical record charts. Descriptive statistics was applied and results shown in the form of frequencies and percentages.

**Results:** Among 31 study participants, the most common presentation was pain abdomen. Majority (93.5%) patients had benign adnexal pathology and 6.45% had malignant pathology. The most common ovarian pathology encountered was Benign surface epithelial tumours (48.4%). Early diagnosis of 2 tubal ectopic and 1 ovarian ectopic pregnancy was made and managed conservatively.

**Conclusions:** Early diagnosis and intervention is helpful in adolescent girls to conserve their ovarian function. Early diagnosis of ectopic pregnancy in stable patients can be managed conservatively. A high RMI should raise a suspicion of malignancy.

**Keywords:** Adnexal mass, CA-125, Ectopic pregnancy, Ovarian malignancy, Ovarian tumour, RMI, Tubo-ovarian mass, Tumour markers

### INTRODUCTION

Adnexal masses can be of ovarian, tubal or para-ovarian origin. They may be detected either by physical examination or radiological imaging as part of their evaluation for their symptoms or by imaging done for any other indication.<sup>1</sup> Acute surgical emergencies of gynaecological origin can be because of torsion of adnexa, cyst rupture or hemorrhage into the cyst. Ectopic pregnancy must be ruled out in women of reproductive age. CA-125 may assist in the evaluation of an adnexal mass in appropriate patients. However, this level alone is not recommended for differentiating between a benign and a malignant adnexal mass.<sup>2</sup> They are of low utility and

validity during pregnancy.<sup>3</sup> Ultrasonography is the first choice for imaging any adnexal mass. In pregnant women, it is suitable for guiding surgical intervention if indicated.<sup>4</sup> Computed tomography and magnetic resonance imaging may show better malignant characteristics in the ovary. Adnexal masses are of concern as malignant ovarian tumours have high mortality rate.<sup>5</sup> No effective screening measures are available for diagnosis of ovarian malignancy. Hence, 70% of ovarian malignancies are diagnosed at a later stage.<sup>6</sup> The prevalence of asymptomatic adnexal masses is 0.17% to 5.9% and symptomatic masses is 7.1% to 12%.<sup>7</sup> A proper clinical examination and pre-operative work up is essential to differentiate malignant tumours from benign ones. Early

intervention is essential especially in adolescent girls to conserve the ovarian function. Asymptomatic, small, well-defined adnexal masses are monitored by periodic radiological evaluation. Surgical management is opted when rapid growth occurs in these masses or if the patient becomes symptomatic, or if the cyst develops more concerning features, such as solid components. Large mass with complexity, projections, septation, irregularity, or bilaterality when occurring in pre-pubescent or postmenopausal women may indicate cancer. Radiological work-up will aid in early referral to oncologist if malignancy is suspected.<sup>8</sup> Early diagnosis and management have a 5-year survival rate of 90%.<sup>9</sup> The present study aimed to determine the prevalence of different histopathologic types of adnexal masses among women who presented to our hospital.

### Aim

The aim was to study the prevalence of histopathologic types of adnexal masses in different age groups.

## METHODS

### Study design and setting

It was a retrospective study conducted at the department of obstetrics and gynaecology, Pondicherry Institute of Medical Sciences, Puducherry, between May 2019 and April 2022.

### Selection criteria

All cases of sonographically diagnosed adnexal masses diagnosed and managed.

### Ethical approval

Ethical approval was obtained from institutional ethical committee.

### Methodology

The study included 31 study participants diagnosed to have adnexal masses. Data regarding age, symptoms, ultrasound findings, tumour markers, RMI score, diagnosis, mode of approach were collected from the medical record charts. Histopathologically confirmed reports were analysed and compared. CA-125 was the main tumour marker sent for patients with complex ovarian tumour.  $\beta$  human chorionic gonadotropin was sent for women of reproductive age group. Serum alpha fetoprotein (AFP) and lactate dehydrogenase (LDH) was also done in women with suspected dermoid.

Risk of malignancy index (RMI) was calculated using the formula:

$$RMI = U \times M \times CA-125$$

Ultrasound characteristics (U)- bilateral lesions, evidence of metastases, evidence of solid areas, multilocular cyst, presence of ascites.

If none of these characteristics were found, U =0; If one, U =1; If two or more, U =3

Menopausal status (M)- If premenopausal, M =1; If postmenopausal, M =3

Serum CA-125 level [U per mL (kU per L)]

### Variations on RMI

In RMI 2, postmenopausal status =4, and if two or more radiologic characteristics are present, U =4

In RMI 3, postmenopausal status =3, and if two or more radiologic characteristics are present, U =3.

RMI of 200 or more was considered as positive.

2 patients with tubal ectopic pregnancy were managed medically for hemodynamically stable patients. Surgical approach was either by laparoscopy or laparotomy. Indications for surgery were large mass >8 cm, mass with symptoms and solid components, persisting ovarian cyst, acute symptoms as in torsion. Symptomatic pregnant women were operated during second trimester and cystectomy was done for others with large ovarian cyst during caesarean section.

### Statistical analysis

Descriptive statistics was applied and results shown in the form of frequencies and percentages.

## RESULTS

The demographic characteristics of the participants were studied. Out of 31 patients diagnosed to have adnexal mass, 32.3% were in the age group of 30-40 years. 9 women (29%) were found to be post-menopausal.

**Table 1: Distribution of adnexal masses based on age group.**

Age group	Total number of cases	Percentage
20-30 years	8	25.8
30-40 years	10	32.3
40-50 years	5	16.1
>50 years	8	25.8
<b>Total</b>	<b>31</b>	<b>100</b>

The most common clinical presentation was abdominal pain which was found in 20 patients (64.5%). 3 of them had torsion of ovarian cyst and they were taken up for emergency laparoscopy/laparotomy. Second common

presenting symptom was mass abdomen (16.1%). 2 patients (6.5%) remained asymptomatic.

**Table 2: comparison of adnexal masses and menopausal status.**

Post-menopausal	Total number of cases	Percentage
Yes	9	29
No	22	71
<b>Total</b>	<b>31</b>	<b>100</b>

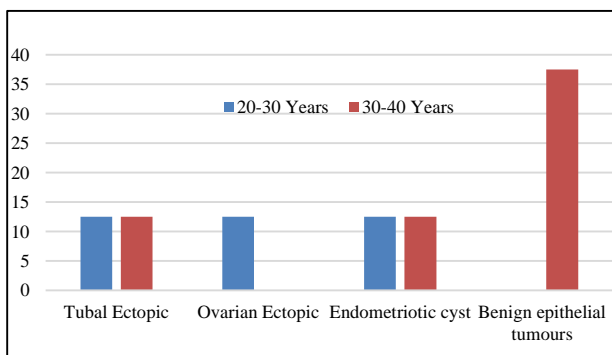
Among 31 participants, 9 (29%) were diagnosed to have ovarian pathology. This included 1 patient with ovarian ectopic pregnancy. Para-mesonephric cyst was confirmed by histopathological examination in 4 patients (12.9%).

**Table 3: Distribution of adnexal masses among different age group.**

Adnexal mass by origin	20-30 years	30-40 years	40-50 years	>50 years	Total
Ovary	5	7	4	8	24 (77.42%)
Para-mesonephric	1	2	1	0	4 (12.9%)
Ectopic	2	1	0	0	3 (9.7%)
<b>Total</b>	<b>8</b>	<b>10</b>	<b>5</b>	<b>8</b>	<b>31 (100%)</b>

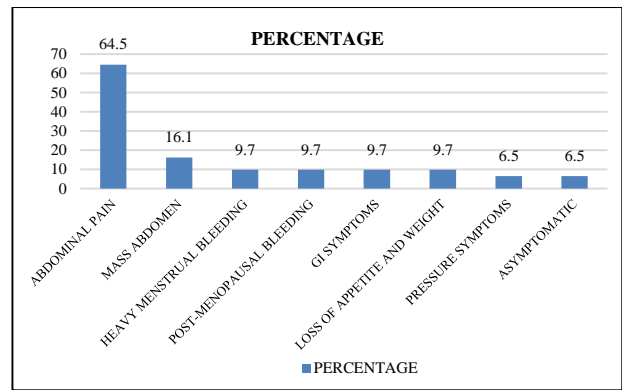
**Table 4: Distribution of histologic type of adnexal masses among different age group.**

Adnexal mass	20-30 years	30-40 years	40-50 years	>50 years	Total
Benign serous cystadenoma	0	2 (7.14%)	4 (14.3%)	2 (7.1%)	8 (28.6%)
Benign mucinous cystadenoma	1 (3.6%)	4 (14.3%)	1 (3.6%)	0	6 (21.4%)
Dermoid cyst	1 (3.6%)	0	1 (3.6%)	0	2 (7.1%)
Mixed dermoid cyst and serous cystadenoma	0	0	0	1 (3.6%)	1 (3.6%)
Lutein cyst	1 (3.6%)	0	0	0	1 (3.6%)
Endometriotic cyst	1 (3.6%)	2 (7.1%)	0	0	3 (10.7%)
Para-mesonephric cyst	1(3.6%)	2 (7.1%)	1 (3.6%)	0	4 (14.3%)
Borderline serous tumour	0	0	0	1 (3.6%)	1 (3.6%)
Granulosa cell tumour	0	0	0	1 (3.6%)	1 (3.6%)
High grade serous carcinoma	0	0	0	1 (3.6%)	1 (3.6%)
<b>Total</b>	<b>5</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>28</b>



**Figure 2: Distribution of adnexal masses among pregnant women.**

30 women were married (96.7%), and of those 8 were pregnant (26.7%). Among the pregnancy women, 3



**Figure 1: Comparison of presenting symptoms among patients with adnexal masses.**

(37.5%) were diagnosed to have ectopic pregnancy. All the 3 patients were hemodynamically stable and medical management was done.

Benign serous cystadenoma was detected in 8 (28.6%) of individuals and most of them (14.3%) were in the age group of 40-50 years. Benign mucinous cystadenoma was noted in 6 (21.4%) of cases and 14.3% were in the age group of 30-40 years. Dermoid cyst was found in 7.1% of patients and mixed dermoid and serous cystadenoma was detected in 1 (3.6%) post-menopausal woman. Bilaterality was found in 3 patients (6.5%). Borderline serous tumour was noted in 1 woman more than 50 years of age (Table 4).

Benign masses were common in the age group of 20-49 years. Among 6 women more than 50 years of age, 4

(12.9%) had benign masses. Ca-125 was found to be elevated in 3 (10.1%) cases of endometriotic cyst and a case of high-grade serous cystadenocarcinoma. Out of 28 patients, 2 patients reported RMI above 200 score which had positive correlation with the histopathological reports. Out of 31 cases, 2 were confirmed to have ovarian malignancy. Out of which, 1 was high grade serous cystadenocarcinoma and other was granulosa cell tumour. Hysterectomy with salpingectomy was the most common surgery done for post-menopausal women. Women of younger age group were managed by fertility sparing conservative surgery (Table 5).

**Table 5: Distribution of benign and malignant masses among women </>50 years.**

Age group	Benign	Malignant	Total
<50 years	25 (80.6%)	0	25 (80.6%)
>50 years	4 (12.9%)	2 (6.5%)	6 (19.4%)

## DISCUSSION

The present study included 28 patients who were surgically managed for adnexal masses of size more than 8 cm or those who presented with acute abdomen or those in suspicion for malignancy. 3 patients of reproductive age group were diagnosed to have ectopic pregnancy and successful medical management was done. Functional ovarian cysts usually resolve spontaneously.<sup>10</sup> Oral contraceptives, over a period of 3 to 6 months, also resolves the functional ovarian cysts. It is also helpful in distinguishing a physiological ovarian cyst from a pathological one.<sup>11</sup> A simple, unilocular cystic ovarian lesion, can be monitored with serial ultrasonography and CA-125 over a period of time so that unnecessary excision is avoided. A unilocular echo free ovarian cyst, to be malignant, is less than 1.6%. Therefore, ultrasonography, tumour markers can aid in diagnosis. However, histopathological examination gives a final confirmation.<sup>12</sup>

This descriptive study was undertaken, to analyse and correlate the age group, clinical presentation and the histopathological diagnosis in patients who presented to our hospital over a period of 2 years. In our study, abdominal pain was the commonest symptom, 20 (64.5%) cases; same incidence was reported in a study by Kayastha.<sup>13</sup> The incidence of benign epithelial tumour was 14 (50 %) cases. It was also the commonest tumour encountered and the age incidence was 20 to 49 years. Similar findings were reported by Pilli, Gupta and Kayastha.<sup>13-15</sup>

Asymptomatic masses that are discovered in the first trimester should be evaluated by ultrasound looking for features of malignancy. Surgery is preferably done in second trimester if malignancy is suspected or if the patient is symptomatic. This is to avoid the risks of miscarriage if performed early or preterm delivery if performed later.<sup>16</sup> MRI is preferable whenever adequate evaluation of the mass is not possible by ultrasound. In the present study, 2

out of 8 pregnant women were operated during second trimester as they were symptomatic. Cystectomy was done for 3 women during obstetrically indicated caesarean section.

Ovarian malignancy is rarely seen in the age group of 15-40 years.<sup>17</sup> The functional, non-neoplastic and benign cystic ovarian lesions are common in the younger age. However, the chance of malignancy increases as the age advances. We recommend screening women above 50 years for ovarian malignancy when they present to the clinic with suggestive symptoms since there is a lifetime risk of 1-1.5% of having ovarian cancer.<sup>18</sup> We used RMI for preoperative evaluation to differentiate benign and malignant adnexal masses. RMI has been useful in epithelial ovarian cancer. In our study, RMI was elevated in a case of high-grade serous carcinoma. However, it is not of much use in diagnosing other malignancies. Combining gray-scale ultrasound with colour Doppler study and incorporating International Ovarian Tumor Analysis (IOTA) rules would have shown a high sensitivity and specificity for prediction of malignancy in adnexal masses.<sup>19</sup>

In the present study, only RMI was calculated. RMI was found to be elevated in benign conditions like endometrioma. It was low in mucinous and non-epithelial ovarian tumours. Other scoring systems with high sensitivity and specificity should have been considered.

## CONCLUSION

The most commonly encountered adnexal masses were benign and arose from the ovary. Benign epithelial ovarian tumours were most commonly encountered. This was followed by para-ovarian cyst and endometriotic cyst. Ultrasonography is of importance in differentiating benign from malignant masses. In case of ovarian tumour which is asymptomatic and those which have regular morphological features, interval monitoring is done and surgery is avoided. Selective and tailored surgery should be done for woman requiring surgical management. Ovarian preservation should be our main goal, so that long term morbidity can be avoided. Combining gray scale ultrasound with colour Doppler study and incorporating International Ovarian Tumor Analysis (IOTA) rules are recommended in predicting cancer. In case of suspicion of malignancy, early and prompt referral to oncologist is advised.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Prince S. A prospective study of adnexal masses with its evaluation by risk of malignancy index among

- patients attending tertiary care hospital. *Int J Res Rev.* 2020;7(12):194-9.
2. Biggs WS, Marks ST. Diagnosis and management of adnexal masses. *Am Fam Phys.* 2016;93(8).
  3. Leiserowitz GS. Managing ovarian masses during pregnancy. *Obstet Gynecol Surv.* 2006;61(7):463-70.
  4. Yacobozzi M, Nguyen D, Rakita D. Adnexal masses in pregnancy. *Semin Ultrasound CT MR.* 2012;33(1):55-64.
  5. Valentin L, Jurkovic D, Van Calster B, Testa A, Van Holsbeke C, Bourne T, et al. Adding a single CA 125 measurement to ultrasound imaging performed by an experienced examiner does not improve preoperative discrimination between benign and malignant adnexal masses. *Ultrasound Obstet Gynecol.* 2009;34(3):345-54.
  6. Goff BA, Mandel LS, Drescher CW, Urban N, Gough S, Schurman KM, et al. Development of an ovarian cancer symptom index: possibilities for earlier detection. *Cancer.* 2007;109(2):221-7.
  7. Edmonds DK, Lees C, Bourne T. *Dewhurst's Textbook of Obstetrics and Gynaecology.* 9th edn. John Wiley and Sons Ltd.; 2018.
  8. American College of Obstetricians and Gynecologists. Practice bulletin no. 174: evaluation and management of adnexal masses. *Obstet Gynecol.* 2016;128(5):e210-26.
  9. Yazbek J, Raju SK, Nagi JB, Holland TK, Hillaby K, Jurkovic D. Effect of quality of gynaecological ultrasonography on management of patients with suspected ovarian cancer: a randomised controlled trial. *Lancet Oncol.* 2008;92:124-31.
  10. Modesitt SC. Risk of malignancy in unilocular ovarian cystic tumors less than 10 centimeters in diameter. *Obstet Gynaecol.* 2003;102(3):594-9.
  11. Spanos W. Preoperative hormonal therapy of cystic adnexal masses. *Am J Obstet Gynaecol.* 1973;116(4):551-6.
  12. Alacazar JL, Merce LT, Laparte C, Jurado M, Garcia GL. A new scoring system to differentiate benign from malignant adnexal masses. *Am J Obstet Gynaecol.* 2003;188(3):685-92.
  13. Kayastha S. Study of ovarian tumors in Nepal Medical College Teaching Hospital. *Nepal Med Coll J.* 2009;11(3):200.
  14. Pilli GS, Suneeta K, Dhaded A, Yenni V. Ovarian tumours: a study of 282 cases. *J Indian Med Assoc.* 2002;100(7):423-4.
  15. Gupta N, Bisht D, Agarwal AK, Sharma VK. Retrospective and prospective study of ovarian tumours and tumour-like lesions. *Indian J Pathol Microbiol.* 2007;50(3):525-7.
  16. Aggarwal P, Kehoe S. Ovarian tumours in pregnancy: a literature review. *Eur J Obstet Gynecol Reprod Biol.* 2011;155(2):119-24.
  17. Cannistra SA. Cancer of the Ovary. *N Engl J Med.* 2004;351(24):2519-29.
  18. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2018. *CA Cancer J Clin.* 2018;68(1):7-30.
  19. Abbas AM, Zahran KM, NA, Kamel HS. A new scoring model for characterization of adnexal masses based on two-dimensional gray-scale and colour Doppler sonographic features. *Facts Views Vis Obgyn.* 2014;6(2):68-74.

**Cite this article as:** Janice BA, Padma A. Comprehensive review of adnexal masses in a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol* 2023;12:2804-8.