**Original Article**

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# Prevalence, Diagnosis and Management of Adnexal Mass in Reproductive Age Group

**Bakhtawar[1], Pushpa Sirichand[2], Shaista Khan[3], Samia Aijaz[4], Madiha Abbasi[5], Bhavita Kumari[6]**

[1]Postgraduate trainee Obs and Gynae Isra university Hospital Hyderabad
[2]Prof. Obs and Gynae Isra university Hospital Hyderabad, [3]Senior Resident, Department of Obs & Gynae Isra Hospital Hyderabad
[4]Assistant Professor Obs and Gynae/ Urogynaecology, LUMHS/ Jamshoro
[5]Associate Professor, Obs and Gynae, LUMHS/ Jamshoro, [6]Gynecologist, Liaquat University Hospital Jamshoro/Hyderabad

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***Address of Correspondent***
*Dr. Bakhtawar*
*Postgraduate trainee Obs and Gynae Isra university Hospital Hyderabad*
*bakhtawaribrahim20@gmail.com*

**ABSTRACT**

Objective: To determine the prevalence, clinical presentation, diagnostic patterns, and management of adnexal masses among women of reproductive age.

Methodology: This cross-sectional study was conducted among 102 women of reproductive age presenting with symptoms suggestive of an adnexal mass at the Department of Gynecology and Obstetrics, Isra University Hospital, Hyderabad, from July to December 2025. Patients underwent clinical assessment, transabdominal and transvaginal ultrasonography, and evaluation of tumor markers where indicated. Management was based on the nature and clinical characteristics of the mass and included conservative or surgical treatment. Data were analyzed using SPSS version 21.0. Frequencies, percentages, means, and standard deviations were calculated, while chi-square testing was used for associations, with $p<0.05$ considered statistically significant.

Results: The mean age of participants was 33.35±4.05 years and the mean BMI was 27.70±3.74 kg/m². Pain was the most common presenting symptom, frequently associated with menstrual irregularities and vaginal bleeding (27.5%). Right-sided ovarian cysts were the most common diagnostic finding (35.3%), followed by bilateral ovarian cysts (17.6%), bilateral ovarian masses (15.7%), and left-sided ovarian cysts (11.8%). Adnexal mass type was significantly associated with age and BMI (p=0.001), whereas no significant association was observed with residential status (p=0.785). Most patients (92.2%) underwent laparotomy, with cystectomy (36.3%) and hysterectomy (33.3%) being the common associated procedures, while 7.8% were managed conservatively.

Conclusion: Adnexal masses were predominantly ovarian cysts in women of reproductive age. Pain was the most frequent presenting symptom, and surgical management, particularly laparotomy, was the predominant treatment approach.

Keywords: Adnexal mass; Ovarian cyst; Reproductive age; Diagnosis; Management

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## Introduction

Adnexal masses, arising from the ovary, fallopian tube, or surrounding connective tissue, occur in women of all ages,1 characterize one of the most common and clinical challenging health condition observed in gynecological practice, specifically among females with reproductive age group. The pelvic masses occur in up to 20% of women during their lifetime, and whereas adnexal masses originate in the fallopian tubes, ovaries, and the surrounding areas are mostly benign, assessment must always include estimation for symptoms suggestive of malignancy, such as abdominal pain, bloating, and early feeling of fullness.[2]

The ovarian masses may be functional cyst or tumors benign, malignant and inflammatory. The adnexal masses incidence rises progressively with age, from around 0.43 per 100,000 woman-years at one year of the age to as higher as 152 per 100,000 woman-years by 35 years of the age, with ovarian masses approximately 6.9% of this incidence and ovarian neoplasms particularly for 4.7%.[3] Many women with adnexal masses may be asymptomatic, while certain may have pain abdomen, abdominal lump, menstrual irregularities, infertility, bleeding per vagina, fatigue, weight loss, increase urinary urgency and urinary retention, and certain may present with the acute abdomen which may due to infection, hemorrhage, torsion, rupture of ovarian cyst or the ectopic pregnancy ruptured.[4,5] The asymptomatic adnexal masses are like small simple cyst which resolves spontaneously or by conservative treatment. Clinical diagnosis of adnexal masses is based on symptoms and examination along with ultrasonography confirms the presence or absence of a suspected pelvic mass.[6] Additionally among women of reproductive age specifically, ectopic pregnancy must always be considered as a differential diagnosis, and the beta-hCG level should be obtained in every women presenting with an adnexal mass.[2]

Specifically, among women with reproductive-age, the pathological pattern differs significantly from that seen in younger or the older women. The functional ovarian lesions are among the most frequent common adnexal abnormalities, particularly in reproductive-age women. These comprise follicular cysts, hemorrhagic cysts, corpus luteum cysts, and theca lutein cysts, whereas other non-neoplastic lesions include endometriomas, tubo-ovarian abscesses, hydrosalpinx, and the paraovarian or paratubal cysts. Such lesions are typically benign and often resolve spontaneously, while some may require intervention because of symptoms, prolonged duration, torsion, or the uncertainty of diagnosis.[7,8] Moreover the infective and pregnancy- associated etiologies must also be measured in this age group of women, including tubo-ovarian abscess and ectopic pregnancy, both of which reflect gynecological emergencies requiring quick recognition. According to a clinicopathological Indian study of 62 women with mean age of 33.1 years, the most frequent site of origin of adnexal mass was the ovary (92.41%) followed by fallopian tube (6.20%) and the broad ligament aroind (1.39%), with most to the women 79.31% had non neoplastic or benign adnexal, and concluded that adnexal masses among women with reproductive age group were mostly non-neoplastic and benign, in clear contrast to peri- and postmenopausal women, in whom the malignancy observed more frequently.[9]

The diagnostic evaluation of adnexal masses depends on primarily on clinical examination, ultrasound, transvaginal ultrasonography (TVU), and serum tumor markers, most importantly CA-125. According to a study enrolling 127 women, observed that the CA-125, when combined with other ultrasonographic features, may improve the accuracy of distinguishing benign from malignant adnexal tumors,[10] whereas another study reported that the risk of Malignancy Index at a cutoff of 200 demonstrated a sensitivity of 54.6% and specificity of 85.7% for predicting malignancy.[11] Moreover the management of adnexal masses is guided principally by the likelihood of malignancy, size of the mass and the severity of symptoms, ranging from conservative observation for asymptomatic, benign lesions as per sonography to surgical intervention, principally via a laparoscopic method, for the masses with suspicious features, prolonged growth, or acute complications such as hemorrhage or the torsion.[12] Regardless of the accumulating international and regional evidence, the generated data at local level specifically describing the prevalence, diagnostic pathway, and management of adnexal masses during reproductive age group remain comparatively limited. Assumed the considerable clinical importance of timely and accurate diagnosis in these women, this study has been conducted to determine the prevalence, diagnostic characteristics, and management of adnexal masses among women of reproductive age group.

# Methodology

This was a cross-sectional study conducted at the Department of Gynecology and Obstetrics, Isra University Hospital, Hyderabad. The study was conducted over a six-month period from July 2025 to December 2025 after approval of the synopsis by the College of Physicians and Surgeons Pakistan (CPSP) (Ref. No. CPSP/REU/OBG-2022-165-11799). Ethical approval was also obtained from the ERC Committee of Isra University Hospital (IU/CP.REC(FCS)2025/14/26).

A sample size of 102 participants was calculated using the WHO sample size calculator and the formula $n = [Z^2_{1-\alpha/2}\ P(1-P)]/d^2$, based on a reported prevalence of hysterectomy among women of reproductive age with adnexal masses of P = 5.71%17, with a margin of error of

4.5% and a confidence level of 95%. A non-probability consecutive sampling technique was used.

All female patients aged 20–40 years admitted to the Department of Obstetrics and Gynecology with signs and symptoms suggestive of an adnexal mass, including pelvic, abdominal, or back pain, abdominal distension, menstrual irregularities, bleeding per vagina, fatigue, and weight loss, were included in the study. Women with masses arising from the urinary or gastrointestinal tract, those with a known malignancy elsewhere, pregnancy-related physiological ovarian changes that did not meet the criteria for an adnexal mass, patients with incomplete medical records, and those unwilling to participate in the study were excluded.

Written informed consent was obtained from all participants after explaining the objectives of the study. They were assured that all information would be kept confidential and that participation was entirely voluntary and would not affect their treatment. A detailed demographic, menstrual, obstetric, and medical history was obtained from each patient. General, physical, systemic, and pelvic examinations were performed. Demographic and clinical data, including age, marital status, BMI, presenting complaints, duration of symptoms, residential status, and educational status, were recorded on a pre-designed proforma.

All patients were evaluated for adnexal masses using transabdominal ultrasonography with a full bladder, followed by transvaginal sonography with an empty bladder. Ultrasonography reports and tumor marker results of adnexal masses with complex morphology were analyzed. Following confirmation of an adnexal mass, patients were managed conservatively or surgically according to the nature of the mass and the hospital management protocol. Management outcomes were recorded as conservative treatment, laparoscopic surgery, laparotomy, hysterectomy, or cystectomy. All relevant information was collected by the researcher herself.

All data were entered and analyzed using SPSS version 21.0. Mean and standard deviation were calculated for numerical variables, while frequencies and percentages were calculated for categorical variables. Stratification was performed with respect to age, BMI, duration of symptoms, marital status, clinical symptoms, and residential status. Post-stratification chi-square tests were applied, and a p-value of $<0.05$ was considered statistically significant.

# Results

A total of 102 women were enrolled in the study. The mean age was 33.35±4.05 years, and the mean BMI was 27.70±3.74 kg/m², indicating that most participants were overweight. The majority of participants were married (72.5%) and from rural areas (66.7%). Regarding educational status, most participants had secondary education (26.5%), followed by intermediate education (22.5%) and matriculation (17.6%). The illiteracy rate was 13.7%, while only 3.9% had graduation or higher education.

Pain was the most common presenting symptom and was frequently associated with menstrual irregularities and bleeding per vagina (27.5%), followed by pain with menstrual irregularities alone (19.6%) and pain with abdominal distension and menstrual irregularities (12.7%). Isolated pain without any other associated symptom was uncommon (1.0%). These findings indicate that most women presented with multiple overlapping symptoms rather than a single complaint, as shown in Table I.

Regarding the diagnostic distribution of adnexal masses, ovarian cysts were the predominant finding. Right-sided ovarian cysts were the most common (35.3%), followed by bilateral ovarian cysts (17.6%) and bilateral ovarian masses (15.7%). Left-sided ovarian cysts accounted for 11.8% of cases. Endometrioma, tubo-ovarian abscess, and hemorrhagic or endometriotic cysts were comparatively less common, each accounting for less than 10% of cases. Overall, simple and bilateral ovarian cysts constituted the majority of adnexal masses in this cohort, as shown in Table II.

Regarding management, the majority of patients (92.2%) underwent laparotomy. Cystectomy was performed in 36.3% of patients and hysterectomy in 33.3%, often in combination with laparotomy. Laparotomy therefore served as the main surgical approach for definitive management. Only 7.8% of patients were managed conservatively without surgical intervention, as shown in Table III.

Stratification analysis showed a significant association between the type of adnexal mass and age and BMI ($p=0.001$). Right-sided ovarian cysts were most frequent overall and were particularly common among women aged 20–30 years, whereas bilateral cysts and masses were more frequent among women aged 31–40 years and those with a BMI >25.0 kg/m². No significant association

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was observed between residential status and the type of adnexal mass (p=0.785), as shown in Table IV.

**Table I: Descriptive statistics of demographic and clinical variables, (n=102)**

| Variables | | Descriptive statistics | |
|---|---|---|---|
| **Mean age** | | 33.35±4.05 years | |
| **Mean BMI** | | 27.70±3.74 kg/m² | |
| **Marital status** | Married | 74 | 72.5 |
| | Unmarried | 28 | 27.5 |
| | Total | 102 | 100.0 |
| **Residential status** | Rural | 68 | 66.7 |
| | Urban | 34 | 33.3 |
| | Total | 102 | 100.0 |
| **Educational status** | Illiterate | 14 | 13.7 |
| | Primary | 16 | 15.7 |
| | Secondary | 27 | 26.5 |
| | Matric | 18 | 17.6 |
| | Inter | 23 | 22.5 |
| | Graduation or above | 04 | 03.9 |
| Pain + Menses irregularities + Bleeding per vagina | | 28 | 27.5% |
| Pain + Menses irregularities | | 20 | 19.6% |
| Pain + Abdominal distension + Menses irregularities | | 13 | 12.7% |
| Pain + Abdominal distension + Menses irregularities + Fatigue | | 06 | 5.9% |
| Pain + Abdominal distension + Menses irregularities + Bleeding per vagina + Weight loss | | 06 | 5.9% |
| Pain + Menses irregularities + Fatigue | | 05 | 4.9% |
| Pain + Abdominal distension + Fatigue + Weight loss | | 05 | 4.9% |
| Pain + Menses irregularities + Bleeding per vagina + Fatigue | | 05 | 4.9% |
| Pain + Abdominal distension + Menses irregularities + Bleeding per vagina | | 04 | 3.9% |
| Pain + Abdominal distension + Menses irregularities + Weight loss | | 03 | 2.9% |
| Pain + Abdominal distension + Menses irregularities + Bleeding per vagina + Fatigue | | 02 | 2.0% |
| Pain only | | 01 | 1.0% |
| Pain + Bleeding per vagina | | 01 | 1.0% |
| Pain + Fatigue | | 01 | 1.0% |
| Pain + Abdominal distension + Menses irregularities + Fatigue + Weight loss | | 01 | 1.0% |
| Pain + Abdominal distension + Bleeding per vagina + Fatigue + Weight loss | | 01 | 1.0% |

# Discussion

Adnexal masses are common gynecological problems among women of reproductive age and represent a diverse spectrum of conditions, ranging from benign functional lesions to malignant tumors. Accurate diagnosis and appropriate management are essential to reduce morbidity and mortality while preserving fertility and reproductive health in this important age group. This study was conducted to determine the prevalence of different adnexal masses and their management among 102 women of reproductive age. The mean age of the participants was 33.35±4.05 years, and the mean BMI was 27.70±3.74 kg/m², with the majority being rural residents (66.7%).

**Table II: Frequency of adnexal mass based on diagnosis among women with adnexal mass. (n=102)**

| Adnexal mass based on diagnosis | N | % |
|---|---|---|
| Right Ovarian Cyst | 36 | 35.3% |
| Bilateral Ovarian Cyst | 18 | 17.6% |
| Bilateral Ovarian Mass | 16 | 15.7% |
| Left Ovarian Cyst | 12 | 11.8% |
| Bilateral Endometrioma | 05 | 04.9% |
| Left Ovarian Mass | 04 | 03.9% |
| Tubo-ovarian Abscess | 03 | 02.9% |
| Right Ovarian Mass | 02 | 02.0% |
| Tubo-ovarian Mass | 02 | 02.0% |
| Left Ovarian Cyst (Hemorrhagic) | 01 | 01.0% |
| Left-sided Ovarian Endometriotic Cyst | 01 | 01.0% |
| Right Ovarian Cyst (Endometriotic) | 01 | 01.0% |
| Right-sided Hemorrhagic Cyst | 01 | 01.0% |
| **Total** | **102** | **100.0%** |

**Table III: Frequency of management methods among women with adnexal mass. (n=102)**

| Management methods | | N | % |
|---|---|---|---|
| **Laparotomy** | Yes | 94 | 92.2% |
| | No | 08 | 07.8% |
| **Cystectomy** | Yes | 37 | 36.3% |
| | No | 65 | 63.7% |
| **Hysterectomy** | Yes | 34 | 33.3% |
| | No | 68 | 66.7% |
| **Conservative/ Medical treatment** | Yes | 8 | 07.8% |
| | No | 94 | 92.2% |
| **Total** | | **102** | **100.0%** |

In agreement with the findings of this study, Kloos et al.12 reported a mean patient age of 35.2±5.5 years and a mean BMI of 30.6±8.1 kg/m². Similarly, Tehrani et al.13 reported a mean age of 31.46±4.71 years among 70 women, which was comparable to our findings; however, their reported mean BMI of 23.12±1.01 kg/m² was lower than that observed in our study. Das et al.9 reported a mean age of 38.11 years among women with adnexal masses, which was slightly higher than that observed in our study.

The present study focused exclusively on women of reproductive age and included a relatively limited age range, with a predominance of overweight participants.

According to the central focus of this study for diagnostic prevalence of adnexal masses, the ovarian cysts were the predominant overall, with right-sided cysts being most common (35.3%), following by bilateral cysts (17.6%), bilateral ovarian masses around (15.7%) and left-side cysts around 11.8%, along with endometrioma, tubo-

**Table IV: Post stratification analysis adnexal masses by demographic characteristics.**

| Adnexal mass as per diagnosis | Age groups (years) | | BMI | | Marital status | | Residency | |
|---|---|---|---|---|---|---|---|---|
| | 20-30 | 31-40 | <24.9 | >25.0 | Married | Un-married | Rural | Urban |
| **B/L Endometrioma** | 2 | 3 | 0 | 5 | 4 | 1 | 3 | 2 |
| **Bilateral ovarian cyst** | 2 | 16 | 1 | 17 | 18 | 0 | 13 | 5 |
| **Bilateral ovarian mass** | 2 | 14 | 0 | 16 | 14 | 2 | 9 | 7 |
| **Left ovarian cyst hemmoregic** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| **Left ovarian mass** | 0 | 4 | 0 | 4 | 3 | 1 | 2 | 2 |
| **Left ovary cyst** | 10 | 2 | 10 | 2 | 5 | 7 | 6 | 6 |
| **Left sided ovary endometriotic cyst** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| **Right ovarian cyst** | 21 | 15 | 13 | 23 | 20 | 16 | 25 | 11 |
| **Right ovarian cyst endometriotic** | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| **R sided hemmorgic cyst** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| **Right ovarian mass** | 0 | 2 | 0 | 2 | 2 | 0 | 1 | 1 |
| **Tubo-ovarian Abscess** | 0 | 3 | 0 | 3 | 3 | 0 | 3 | 0 |
| **tubo-ovarian mass** | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 0 |
| **Total** | 40 | 62 | 24 | 78 | 74 | 28 | 68 | 34 |
| ***p-value*** | ***0.001*** | | ***0.001*** | | ***0.010*** | | ***0.785*** | |

ovarian abscess, and hemorrhagic or endometriotic cyst variants were each comparatively uncommon, composedly making up < 10% of cases, indicating that simple or bilateral ovarian cysts constituted the vast majority of adnexal masses in this cohort. The finding were strongly consistent with an Indian clinicopathological study, which comparably reported that the ovary to be the most common site of origin (92.41%) among adnexal masses, with the majority of lesions were benign (79.31%) on histopathology.[9]

The benign predominance was further supported by another study by Anant M et al[13] correlating clinical, ultrasound, and histopathological findings, which reported that the adnexal masses to be of ovarian origin in 72% of patients, with 88% ultimately treated for benign pathology. With the particular reference to the primary outcome Rai R et al[11] which similarly found ovarian-origin masses in 80.3% of cases, with malignancy accounting for a comparatively smaller proportion (12.7%). In agreement with our findings, Vatsa R et al[15] reported that the among 63 pregnancies complicated by adnexal masses, 53 underwent surgical intervention, with the most of the cases (90%) proving benign and only 10% malignant. In the comparison of this study Pandey S et al[16] reported some different findings based on radiological diagnosis of adnexal masses, as ectopic pregnancy being most common outcome (26.66%), followed by infectious pathology around (21.02%), endometriosis (14.87%), and benign ovarian masses around (13.33%), along with ovarian masses malignancy around 13.84%, dermoid cysts with ovarian torsion (5.12%), tubo-ovarian mass (3.07%), TB/cyst (1.53%), and the broad ligament fibroid only (0.51%). However, the findings regarding endometriosis and tubo-ovarian mass were in accordance to this study. There was a key difference in the findings of study compared to other studies of absence of confirmed malignancy, which may be because almost all cases of this study were evaluated based on radiological/ultrasonography findings, rather than histopathological confirmation. Approximately 4 to 6 cases of ovarian mass were suspected for the malignancy; which were not operated on or further treated during the period study, as some left against medical advice (LAMA) whereas others were awaiting treatment, and thereby the study was unable to capture definitive evidence of malignancy.

Additionally, according to clinical profile in this study the pain emerged as a nearly universal presenting symptom in the present study, most frequently occurring together with menstrual irregularities, abdominal distension and vaginal bleeding. The findings were consistent with the broader ovarian symptom literature, where the ICBP population survey reported that the persistent pelvic pain (79.0%) and abdominal pain (85.0%) were among the well-recognized symptoms associated with ovarian pathology. Comparable findings have been also reported by Dharani V et al[17] where abnormal uterine bleeding (AUB) was the most common presenting complaint (50.90%), followed by pain only (36.80%), pain with a palpable mass (8.80%), and dysmenorrhea was least common (3.50%). Similarly, according to a study by Sobhi A et al[19] reported that the most typical presentation of women was abdominal distension or pain accompanied by a palpable mass (55%, followed by acute abdomen 11.6% and 15.8% presented with fever, nausea, and vomiting.

In this study only 8(07.8%) were taken on conservative treatment and majority of the patients 94(92.2%)

underwent surgical intervention by laparotomy, often combined with cystectomy (36.3%) or hysterectomy (33.3%). likewise a study particularly assessing the role of laparoscopy in the evaluation of adnexal masses among women, cystectomy was the most commonly performed procedure (32%), and conversion to laparotomy was done in 4% of cases, concluding that laparoscopy is highly effective, safe, and feasible when performed with careful preoperative assessments.[20] The findings were further supported by a review on laparoscopic treatment of large adnexal masses, noted that the laparoscopy is a gold standard for benign ovarian masses, proposing surgical outcomes similar to laparotomy while providing earlier recovery.[21] According to retrospective observational study conducted at Aga Khan University Hospital, reported that the of 178 patients, around half (50.6%) underwent ovarian cystectomy, while 25.8% were managed conservatively, 14.6% underwent unilateral salpingo-oophorectomy, 5.6% unilateral oophorectomy, and a smaller proportion (3.4%) had aspiration and biopsy.[22]

The comparatively higher rate of laparotomy in this study, compared with other studies favoring laparoscopy or ovarian cystectomy as the predominant approach, may be attributed to limitations in healthcare facilities, including the limited availability of laparoscopic equipment, expertise, and adequately trained surgical personnel. In addition, many women in our study presented with larger, more complex, or bilateral masses, which were more likely to require an open surgical approach for safe removal. Several patients also underwent combined procedures, such as cystectomy or hysterectomy through laparotomy, reflecting a preference for definitive, single-stage surgical management over minimally invasive approaches.

This study has several limitations. The relatively small sample size limits the generalizability of the findings. Furthermore, patients with suspected malignancy could not be adequately followed up for definitive histopathological evaluation after surgical intervention. Some patients were lost to follow-up, some left against medical advice (LAMA), while others were still awaiting further management at the time of data collection. Therefore, further large-scale, multicenter studies with larger sample sizes and more complete follow-up are recommended, particularly to ensure that women with suspected malignancy are systematically followed through to definitive surgical and histopathological outcomes at the local level.

# Conclusion

The study underscores that the adnexal masses are a common gynecological presentation among women with reproductive age group, predominantly benign in nature without any evidence of malignancy, along with ovarian cysts, whether unilateral or bilateral, representing the majority of patients. The pain emerged as a nearly universal presenting symptom, often accompanied by menstrual irregularities, abdominal distension and abnormal bleeding. Additionally, the surgical intervention, predominantly via laparotomy, remained the primary treatment approach often combined with cystectomy or hysterectomy in most of the women, whereas the conservative management was least common. Overall findings highlighted the need of early diagnosis, timely intervention, and, wherever feasible, fertility-preserving surgical approaches to protract the ability of conceiving of women during their fertile period.

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