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Dr. J Srimathi A
Associate Professor, Institute of Obstetrics and Gynaecology, MMC, Chennai, Tamil Nadu, India

Dr. S Preeti Pushpam
Assistant Professor in Obstetrics& Gynaecology, Govt. Mohan Kumaramangalam Medical College, Salem, Tamil Nadu, India

Dr. Ponnuraja C
Department of Statistics, National Institute for Research in Tuberculosis, Chennai, Tamil Nadu, India

S Padmanaban
Department of Statistics, National Institute for Research in Tuberculosis, Chennai, Tamil Nadu, India

Dr. Adhin Bhaskar
Department of Statistics, National Institute for Research in Tuberculosis, Chennai, Tamil Nadu, India

Corresponding Author:
Dr. J Srimathi A
Associate Professor, Institute of Obstetrics and Gynaecology, MMC, Chennai, Tamil Nadu, India

Evaluation of adnexal mass in reproductive and perimenopausal age group

Dr. J Srimathi A, Dr. S Preeti Pushpam, Dr. Ponnuraja C, S Padmanaban and Dr. Adhin Bhaskar

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Abstract
Background: The ovaries are the organs which can give rise to both benign and malignant tumors through the life of women. The ovarian cancer remains to hold the fifth leading cause of cancer related deaths. The most important is the family history as 10% of patients have inherited genetic predisposition. Ovarian mass are a frequent finding in general gynecology and most are cystic. His to; logically ovarian cysts are often divided into neoplastic growth (ovarian cystic neoplasms) and those created by disruption of normal ovulation (functional ovarian cysts).
Aims and Objective: Primary Objective: The primary objective of my study is to evaluate the ADNEXAL MASS in reproductive and perimenopausal age group in view of analyzing the percentage of malignant adnexal tumors in this age group.
Methodology: The study included patients in the reproductive and perimenopasual age group admitted in ISOKGH for evaluation in 1 year duration. From all patients basic data (age, occupation, education and address) and gynaecological data (menarche age, parity, last menstrual cycle, symptoms and family history) were obtained.
Inclusion Criteria: All reproductive and perimenopausal age group admitted in ISOKGH.
Exclusion Criteria: The patients below 15 and above 50. The patients treated as outpatients.
Results and conclusion: Of all the adnexal mass 15% were malignant lesion, 6% were borderline lesions and the remaining were benign lesions.
Simple Ovarian cyst and mucinous cyst adenoma were the most common benign lesions and the most common malignant lesion was cyst adenocarcinoma.

Keywords: Adnexal mass

Introduction
The ovaries are the organs which can give rise to both benign and malignant tumors throught the life of women. The ovarian cancer remains to hold the fixth leading cause of cancer related deaths. The most important is the family history as 10% of patients have inherited genetic predisposition. Ovarian mass are a frequent finding in general gynecology and most are cystic. His to; logically ovarian cysts are often divided into neoplastic growth (ovarian cystic neoplasms) and those created by disruption of normal ovulation (functional ovarian cysts). Angiogenesis is an essential component of both the follicular and luteal phases of ovarian cycles. It is also a component of various pathologic ovarian cycles. It is also a component of various pathologic ovarian process including follicular cyst formation, PCOS, ovarian hyper stimulation syndrome, benign and malignant ovarian neoplasms. Functional ovarian cysts make up large proportion. Neoplasms fill the remaining category which are predominantly benign.
For differentiation between benign and malignant adnexal masses the RMI calculation method is usually done.
RMI = U x M x CA 125
U = ultrasonographic index
M = menopausal status
The patients are divided into three groups according to RMI values

< 25	- low risk
25-200	- intermediate risk
> 200	- high risk

Iota (international ovarian tumor analysis)

Simple Rules

Rule 1: If one or more M features are present in absence of B feature(s), the mass is classified as malignant.

Rule 2: If one or more B features are present in absence of M feature(s), the mass is classified as benign.

Rule 3: If both M features and B features are present, or if no B or M features present, the result is inconclusive.

M-RULES

B-RULES

M-Rules

M1 – Irregular solid tumor

M2 – Presence of ascites

M3 – Atleat four papillary structures

M4 – Irregular multilocular solid tumor with largest diameter > = 100 mm

M5 – Very strong blood flow (color score 4)

B-Rules

B1 – Unilocular

B2 – Presence of solid components where the largest solid component has a
largest diameter < 7mm

B3 – Presence of acoustic shadows

B4 – Smooth multilocular tumor with largest diameter < 100 mm

B5 – No blood flow (color score 1)

Aims and objective

Primary Objective: The primary objective of my study is to evaluat the adnexal mass in reproductive and perimenopausal age group in view of analyzing the percentage of malignant adnexal tumors in this age group.

Methodology

The study included patients in the reproductive and perimenopasual age group group admitted in ISOKGH for evaluation in 1 year duration.

From all patients basic data (age, occupation, education and address) and gynaecological data (menarche age, parity, last menstrual cycle, symptoms and family history) were obtained.

Furthermore the blood analysis, tumor marker, clinical and ultrasonography, CT findings of pelvic organs and hpe reports were performed.

The risk of malignancy index (RMI) for all patients was calculated.

Iota-Simple rules. Reliable triage test to differentiate between benign and malignant masses.

The outcome for all patients assessed.

Inclusion Criteria

All reproductive and perimenopausal age group admitted in ISOKGH.

Exclusion Criteria

The patients below 15 and above 50

The patients treated as outpatients.

Table 1: Age wise distribution of the study subjects

Age group	Frequency	Percentage	Mean	SD
20 – 30	5	2.5%	43.5	8.2
31 – 40	63	31.5%		
41 – 50	85	42.5%		
51 – 60	42	21%		
>60	5	2.5%		
Total	200	100%		

Table 1 shows the age wise distribution of the study subjects. It is seen from the table that the majority of the study subjects were in the age group between 40 and 50 years with a mean age of 43.5 years and only 2.5% of the study subjects were aged more than 65 years

Table 2: Distribution of the study subjects based on the age of menarche

Age of menarche	Frequency	Percentage	Mean	SD
11	10	5%	13.9	1.2
12	9	4.5%		
13	61	30.5%		
14	54	27%		
15	43	21.5%		
16	23	11.5%		
Total	200	100%		

Table 2 shows the distribution of the study subjects based on the age of menarche. It is seen from the table that majority of the study subjects attained menarche in the age of between 13 and 14 years with a mean age of 13.9 years and only 11.5% of the subjects attained menarche at the age of 16 years.

Table 3: Distribution of the study subjects based on the parity

Parity	Frequency	Percentage	Mean	SD
P1	5	2.5	2.75	0.98
P2	93	46.5		
P3	28	14		
P4	35	17.5		
P5	29	14.5		
Unmarried	10	5		
Total	200	100		

Table 3 shows the distribution of the study subjects based on the parity. 46.5% of the study subjects had parity 2 and 5% were unmarried and 14.5% had the maximum parity of five.

Table 4: Distribution of the study subjects based on their live births

Live births	Frequency	Percentage	Mean	SD
L1	33	16.5	2.2	1.08
L2	56	28		
L2A1	14	7		
L3	23	11.5		

L4	35	17.5		
L5	29	14.5		
Unmarried	10	5		
Total	200	100		

Table 4 shows the distribution of the study subjects based on their live births. Majority of the study subjects had the live births of two and 14.5% had 5 live births with a mean of 2.2.

Table 5: Distribution of the study subjects based on the mode of delivery

Mode of delivery	Frequency	Percentage
LSCS	46	23
NVD	144	72
Unmarried	10	5
Total	200	100

Table 5 shows the distribution of the study subjects based on the mode of delivery. It is seen from the table that more than 70% of the delivery was by normal vaginal delivery and only 23% of the subjects had the history of LSCS.

Table 6: Distribution based on the symptoms presented by the study subjects at the time of admission

Symptoms	Frequency	Percentage
AUB	57	28.5
Distension of abdomen	53	26.5
Distension and pain	10	5
Dull pain	10	5
Severe pain	37	18.5
Vague mass	33	16.5
Total	200	100

Table 6 shows the distribution based on the symptoms presented by the study subjects at the time of admission. It is depicted from the table that the most common symptom presented by the subjects was abnormal uterine bleeding followed abdominal distension and severe pain.

Table 7: Distribution based on the clinical finding of the study subjects

Per Abdomen	Frequency	Percentage
Abdomen distension	11	5.5
AUB	5	2.5
Bulky uterus	13	6.5
Cystic mass	10	5
Mass abdomen	100	50
Tender adnexa	26	13
Uterus 14 weeks	10	5
Vague mass	25	12.5
Total	200	100

Table 7 shows the distribution based on the clinical finding of the study subjects. It is depicted from the table that the most common (50%) clinical finding was mass abdomen and the mass were varying in measurements ranging from 10 x 10 to 15 x 10 cms.

Table 8: Distribution of the study subjects based on their per speculum findings

Per Speculum	Frequency	Percentage
Cervix and vagina healthy	112	56
Cervix healthy	36	18
Cervix exfoliated	24	12
Cervix Flushed	23	11.5
Cervix and vagina flushed	5	2.5
Total	200	100

Table 8 shows the distribution of the study subjects based on their per speculum findings. In more than 50% of the subjects the cervix and vagina was found to be healthy, cervix was exfoliated or flushed only in 24.5% of the subjects

Table 9: Distribution of the study subjects based on the per vagina findings

Per vagina	Frequency	Percentage
Anterior fornix free	4	2
Both fornices-Free	6	3
Cervix and vagina healthy	9	4.5
Fornix fullness	28	14
Left forniceal fullness	48	24
Right forniceal fullness	105	52.5
Total	200	100

Table 9 shows the distribution of the study subjects based on the per vagina findings. The most common per vagina examination finding was right forniceal fullness (52.5%) followed by left forniceal fullness (24%) and bilateral forniceal fullness was seen in 14% of the study subjects.

Table 10: Distribution of the study subjects based on the per abdomen findings

Per abdomen	Frequency	Percentage
Anterior fornix free	9	4.5
Atrophy of uterus	20	10
Bulky uterus	28	14
Normal size	143	71.5
Total	200	100

Table 11shows the distribution of the study subjects based on the per abdomen findings. It is seen from the table that more than 70% of the study subjects had normal size uterus and only 14% presents with bulky uterus.

Table 11: Distribution of the study subjects based on their clinical diagnosis

Diagnosis	Frequency	Percentage
Twisted ovarian cyst	13	6.5
Adenosis + adnexal mass	28	14
Lt adnexal mass	48	24
Ovarian cyst	6	3
Rt adnexal mass	105	52.5
Total	200	100

Table 12 shows the distribution of the study subjects based on their clinical diagnosis. It is seen from the table that the most common clinical diagnosis was right adnexal mass which constitute 52.5% followed by left adnexal mass of 24%, ovarian cyst was diagnosed in only 3% of the study subjects, adenosis was seen in 14% and 6.5% had twisted ovarian cyst.

Table 12: Distribution of the study subjects based on the ultra-sonogram diagnosis

USG	Frequency	Percentage
Torsion of adnexal mass	13	6.5
Adenomyosis + B/L ovarian cyst	23	11.5
complex cyst	4	2
complex ovarian cyst	9	4.5
RT complex ovarian cyst	5	2.5
Lt complex ovarian cyst	10	5
Lt ovarian cyst	33	16.5
ovarian cyst	6	3
RT complex ovarian mass	23	11.5
RT ovarian cyst	54	27
RT ovarian mass	5	2.5
RT ovarian cyst with adenomyosis	5	2.5
simple ovarian cyst	5	2.5
Torsion of ovarian cyst	5	2.5
Total	200	100

Table 13 shows the distribution of the study subjects based on the ultra-sonogram diagnosis. It is depicted from the table that ovarian cyst or ovarian mass of either right or left side of the adnexa was the most common finding observed in ultra-sonogram and among the entire observation right ovarian cyst (27%) was found to be the most common ultra-sonogram diagnosis

Table 13: Distribution of the study subjects based on the uterine length

Size (length cm)	Frequency	Percentage	Mean	SD
<10	146	73	8.5	5.5
11 – 20	48	24		
21 – 30	6	3		
Total	200	100		

Table 14 shows the distribution of the study subjects based on the uterine length. The mean uterine length measured by ultrasonogram was 8.5 cms.

Table 14: Distribution of the study subjects based on uterine breadth

Size (Breadth cm)	Frequency	Percentage	Mean	SD
<10	135	67.5	7.4	4.6
10 – 15	45	22.5		
>15	20	10		
Total	200	100		

Table 15 shows the distribution of the study subjects based on uterine breadth. The mean uterine breadth measured by ultrasonogram was 7.4 cms.

Table 15: Distribution of the study subjects based on the thickness of the wall of the lesion

Wall of the lesion	Frequency	Percentage
Thick	77	38.5
Thin	85	42.5
Normal	38	19
Total	200	100

Table 16 shows the distribution of the study subjects based on the thickness of uterine wall. It is seen from the table in most of the patients the wall of the mass was found to be thin and the wall was normal in thickness in 19% of the study subjects and for the remaining it is found to be thick.

Table 16: Distribution of the study subjects based on the presence of components in the lesions

Components	Frequency	Percentage
Solid components	28	14
Nil	172	86
Total	200	100

Table 16 shows the distribution of the study subjects based on the presence of components in the lesions. It is seen from the table that 14% had solid components in the lesion or the mass removed.

Table 17: Distribution of the study subjects based on the presence of papillary projections in the lesion

Papillary projections	Frequency	Percentage
Nil	176	88
Present	24	12
Total	200	100

Table 17 shows the distribution of the study subjects based on the presence of papillary projections in the lesion. 12% of the patients had papillary projections in the mass which was removed.

Table 18: Distribution of the study subjects based on the values of CA-125

Ca-125	Frequency	Percentage	Mean	SD
<100	152	76	87.4	109.3
100 – 200	10	5		
201 – 300	20	10		
>300	18	9		
Total	200	100		

Table 18 shows the distribution of the study subjects based on the values of CA-125. It is inferred from the table that 76% of the patients had the CA-125 levels less than 100 and for the remaining it was more than 100 and specifically for 9% of the patients it was more than 300 with a mean value of 87.4.

Discussion

The present study was conducted with the objective of evaluating the clinical profile of adnexal masses presenting in women with reproductive age group and perimenopausal women. It was conducted on 200 women presenting to our department with the complaints of symptoms related to adnexal mass. All the women were clinical examines and later ultra-sonogram assessment was done along with measurement of specific tumor marker (CA-125) and they were operated as per the ultra-sonogram report and the specimen (mass) was sent for histopathological examination to check for the malignancy status. In our study of 200 women only 10 women were unmarried and all others were married women.

Today assessing for mass in adnexa is a part of routine gynaecologic examination as because most of the adnexal mass in the early stage remains asymptomatic and so a primary screening of adnexa both by clinical examination and imaging can identify the adnexa mass much early and appropriate intervention can be made in such a way disease progression can be prevented. In particular for the postmenopausal and perimenopausal women the most common mass in the adnexa is usually an ovarian cancer which most often presents without any signs and symptoms in the early stage.

In the present study the mean age of the women presented with adnexal mass was 43.5 years and it is almost similar to the other studies done by Suhshan sharma *et al.*, Anand Dipaketaland Mukut Jyothi Das where they had mentioned the mean age as 42.8, 39.7 and 38.9 years respectively and most of the studies had shown that the OST common age group for the incidence of adnexal mass was in the menopausal or perimenopausal period.

In our study the mean age of menarche was 13.9 years among the study subjects and most of the studies done previously did not show any association between the age of menarche and the occurrence of adnexal mass and similarly the parity status and the number of live births do not have any association over the incidence of adnexal mass and in our study the mean of both parity and live births was 2.2.

The commonest symptom in the present study was abdominal distension and severe pain and it was found to be present in 57% of the patients with adnexal mass and it was comparatively lower when compared to previous studies done by Al shukri *et al.*, Bhagde AD *et al.* and Radhamani S *et al.*, where they found it to be in 98%, 92% and 82% of cases respectively [6, 11, 12]. Second most common symptom found in the present study was abnormal uterine bleeding which was seen in 28.5% of the subjects and the previous studies reported the incidence of AUB as 30 – 35%. None of our patients were asymptomatic while few other studies have reported 8-16% of patients with adnexa mass was found to be asymptomatic.

Although sensitivity of clinical examination for distinguishing a malignant mass from a benign one is somewhat better, these results need to be interpreted with caution. Based on the available literature bimanual examination does not appear to be a sensitive test for detecting the presence of adnexal masses and appears to have limited ability to discriminate benign from malignant masses which is similar to the results of the present study where we were able to feel for the mass either in the right of left fornix by doing a bimanual examination but it is was not possible to differentiate the various pathological lesions.

In our study 80% of adnexal lesions found on sonography, were reported as ovarian cysts and it was almost similar to the study done by Anand Dipak *et al.* which showed the sonography assessment for ovarian cyst as 78%.[6] Despite its universal use, some authors have projected that pelvic examination is inadequate in diagnosing adnexal masses and so the primary care physicians have concerns about pelvic examination because they regard their training is inadequate to avoid any misdiagnosis they required a regular use of ancillary diagnostic procedures. Previous studies had shown that ultra-sonogram has a high sensitivity and specificity values along with very high negative predictive value in diagnosing adnexal masses but the positive predictive value is low. Although ultrasound is considered the primary diagnostic modality for ovarian imaging, there are numerous false-positive and false negative findings.

Uterine anomalies along with adnexa mass is not uncommon and in our study nearly 70% of the patients uterus was normal and for the remaining it was either bulky uterus or atrophic uterus and few studies done early majority of them did not find any associated uterine anomalies with adnexa mass.

Our study shows a higher incidence of adnexa masses in either confined to left or right ovary compared to bilateral origin. In the present study we found a higher prevalence of adnexa masses in the right ovary compared to left ovary. A prospective cohort study done by Louis A on 140 women showed a higher incidence of adnexal masses in the left ovary as compared to the right ovary (49 vs. 33%) which is contrary to our study.

The prevalence of malignancy/borderline tumor was comparable to the report by Balci *et al.* The intra-operative diagnosis of adnexal necrosis upon failure of reperfusion correlates well with the pathological diagnosis similar to other studies.

In the present study the most common finding of the HPE report was simple cyst followed by mucinous cyst adenoma which shows that the benign lesions were found to be more common and among the entire study subjects 15% had malignant lesions such as cyst adenocarcinoma and 6% had borderline lesions and the results are almost in par with the studies done by Radhamani

et al. and Ahmed *et al.*

The most important goal in the analysis of adnexal masses is an attempt to identify non-malignant entities, such as simple cysts, tubal and pelvic inflammatory diseases, or endometriosis, as because these non-neoplastic entities are usually smaller in size and can easily be picked up by USG and was labelled as pathognomonic. However, each of these entities can mimic malignant neoplasm. So it is important to make a preoperative classification of an ovarian mass as benign or malignant at least to an extent so a proper patient triage, referral, and management can be planned. Although it is not going to decide on whether to operate or not it can throw a light on deciding which operative procedure to be carried out whether open laparotomy and proceed or to go for a laproscopy procedure and also helps us to know about the requirement of a gynaecologic oncologists. It is recommended that a 'risk of malignancy index' should be assessed during the laproscopy procedure and if the surgeon suspects a malignancy during the time of the procedure than staging and debulking procedure can be performed without any postponement and this type of procedure is ideally performed by a gynaecologic oncologist.

In the present study we found the benign ovarian lesions to be more common in the younger reproductive age group females whereas the malignant ovarian lesions were more common in the perimenopausal age group females and this association was found to be statistically significant (p <.05) and few of the studies done earlier had also proven the same finding as said in the literature ovarian malignancies is more common in menopausal age.

The current study showed a statistical significant association between the tumor marker level (CA-125) and the ovarian malignancy and there was a perfect correlation between these two whereas the levels are significantly lower in the benign ovarian lesions and the study done by few of the other authors had also proven the same finding.

In our study more than 50% of the patients had total abdominal hysterectomy along with oophorectomy which was either bilateral or confined to a particular side based on the presence of lesion and most of the previous studies which were done earlier had also performed open laparotomy which included total abdominal hysterectomy along with the removal of the ovaries.

Summary and conclusion

- Adnexal mass presentation was found to be more common in the middle age females particularly in the perimenopasual women and the usual presentation was with symptoms of abdominal pain and distension along with dysfunctional uterine bleeding.
- Parity and sterilization procedures did not have any association with the occurrence of adnexal mass
- Adnexal mass did not have any associated pathology in cervic, vagina or uterus
- Per vagina findings shows forniceal fullness in most of the patients with adnexal mass
- Right sided ovarian mass found to be more common than left side or bilateral
- Right adnexal mass was the most common clinical diagnosis
- Right sided ovarian cyst was the most common USG finding
- Mean uterine length and breadth was almost in normal size
- Multi-loculated septa was seen in 30% of the patients in the mass lesion
- Solid components was present in 14% of the lesions
- Papillary projections was seen in 12% of the lesions
- Of all the adnexal mass 15% were malignant lesion, 6% were borderline lesions and the remaining were benign lesions
- Simple Ovarian cyst and mucinous cyst adenoma were the most common benign lesions and the most common malignant lesion was cyst adenocarcinoma.

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