

# Role of ultrasound in diagnosis and differentiation of benign and malignant ovarian mass: A Hospital based study in Western Nepal



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## ABSTRACT

**Background:** As ovarian malignancies are one of the commonest malignancies in female population, timely and accurate diagnosis helps in early treatment resulting in better survival. Ultrasound is easily available diagnostic tool not only to diagnose but also accurately distinguish malignant from benign ovarian masses. **Aims and Objectives:** To evaluate sensitivity, specificity and accuracy of ultrasound in diagnosing and differentiating benign from malignant ovarian masses in comparison with histopathological findings. **Materials and Methods:** A prospective study was carried out from August 2015 to August 2018 for a period of 3 years. Total 150 patients with ovarian masses who were operated in our hospital and their final histopathological reports were available, were included in our study. Ultrasound diagnosis and histopathological diagnosis were compared. **Results:** Sensitivity, specificity and accuracy of ultrasound in diagnosing and differentiating malignant from benign ovarian masses were found to be 78.94%, 98.47% and 88.23% respectively compared with histopathological findings. **Conclusion:** Ultrasound is very sensitive, specific and accurate in not only diagnosing ovarian mass but also in differentiating malignant from benign entities making it invaluable and important diagnostic tool in evaluation of ovarian masses.

**Key words:** Ultrasound; Ovarian mass; Histopathology

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## INTRODUCTION

Pelvic ultrasound remains the most widely used imaging modality to assess adnexal masses.<sup>1,2</sup> Ovarian tumours represent almost 2/3<sup>rd</sup> of adnexal masses.<sup>3</sup> Sonographic evaluation is mainly aimed to differentiate benign from malignant masses. Almost 90% of adnexal masses can be characterized only using ultrasound features of the lesion.<sup>4</sup> Proper evaluation of adnexal mass is important because surgical intervention if possible can be applied in time, thus decreasing morbidity and mortality of patients. Ultrasound findings combined with clinical findings, other tumour markers, CT, MRI can be used to determine if patient can be kept on follow up, advised surgery or refer

to gynaecological oncologist if the mass is unresectable or in advanced stage. Benign ovarian lesions are mostly cystic, unilocular and freely mobile with thin wall and septae if present are thin. No ascites is present. On the other hand, malignant ovarian lesion may be bilateral or unilateral, firm to hard in consistency, have thick wall, irregular margin, thick septations. There are solid components within the cystic lesions or papillary projections form the wall. Age specific incidence rate of ovarian cancer increases from 35 years onwards with a peak between 55 to 64 years.<sup>5</sup> Hence, aim of our study was to know the sensitivity, specificity and accuracy of ultrasound in diagnosing as well as differentiating benign from malignant ovarian masses compared to histopathological results.

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## MATERIALS AND METHODS

The current study is a prospective observational study done from Aug. 2015 to August 2018. Total number of 150 patients who attended gynecology department of Manipal Teaching Hospital and sent to department of Radiology and Imaging whose ultrasound depicted ovarian mass and who underwent operation and histopathological report were available were included in the study. Some patients who came for USG from department other than gynecology and in whom ovarian mass were found were then referred to gynecology department for treatment and follow up. Such patients were also included in our study. Presenting complaints of patient, age, parity, menstrual history etc. were duly noted in our proforma other after taking informed written consent from them. Various tumor markers if sent from gynecology department were also noted. CT or MRI done in such cases were noted and finally histopathological reports were obtained from the department of pathology of our hospital. Statistical analysis was done using SPSS (Version 16). Sensitivity, specificity and accuracy in diagnosing and differentiating benign from malignant ovarian masses were calculated based on final histopathological report.

## RESULTS

In our study, patients presented with various complaints. Most of them presented with lower abdominal pain (61.6%). Some preserved with excessive PV bleeding (14%), irregular menstruation (13%) some had no complaints with incidental detection of ovarian lesions during routine scan. (Figure 1).

The age of patients in our study ranged from 14 to 77 years with a mean age of 40 years. 70 % of women

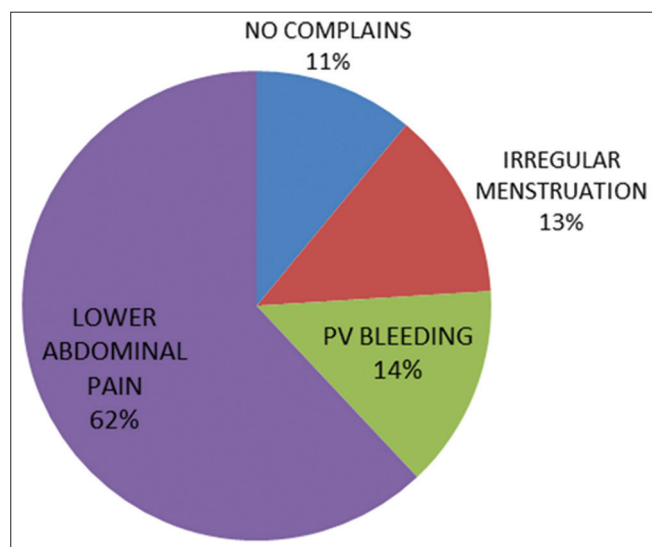


Figure 1: Presenting complains of patients with ovarian mass

were in reproductive age group followed by 16.27 % in postmenopausal age group. (Table 1).

When both cystic and solid components were present, most of the lesions were malignant. Solid masses were also malignant and chances of malignancy increased if cystic areas were present within the mass. If the lesion was totally solid, those showing hyperechoic appearance corresponding to fat, they were benign mostly dermoids. Almost all the cases with papillary projections were malignant. (Table 2).

When USG diagnosis were correlated with histopathological findings, 4 cases were false negative and 2 cases were false positive. Sensitivity, specificity and accuracy of ultrasound in diagnosing and differentiating malignant from benign ovarian masses were found to be 78.94%, 98.47% and 88.23% respectively compared with histopathological findings. (Table 3).

Most common benign ovarian lesion was dermoid (40 out of 133), followed by serous cystadenoma (25 out of 133) with other common finding being mucinous cystadenoma (12 out of 133), endometrioma (13 out of 133) and

Table 1: Age group distribution of patients with ovarian mass

Age group (yrs)	Number of patients	Percentage
10-20	8	5.23%
21-30	33	22.09%
31-40	33	22.60%
41-50	33	22.09%
51-60	19	12.79%
61-70	14	9.30%
71-80	10	6.97%
Total	150	100%

Table 2: USG features of ovarian masses

USG findings	Benign per/133	Malignant per/17
Cystic	100	2
Solid –cystic	11	12
Solid	22	3
Papillary projection present	2	17
Papillary projection absent	131	0

Table 3: Ultrasound diagnosis vs. Histopathological findings

Ultrasound diagnosis	Histopathological findings		Total
	Malignancy present	Malignancy absent	
Malignancy present	15	2	17
Malignancy absent	4	129	133
Total	19	131	150

**Table 4: Histopathological findings**

Benign lesions	
Dermoid	40
Serous Cystadenoma	25
Mucinous Cystadenoma	12
Endometrioma	13
Fibroma	2
Dysgerminoma	1
Fibrothecoma	1
Hemorrhagic cyst	5
Simple cyst	10
Corpus luteal cyst	5
Struma ovarii	2
Benign brenner's tumor	1
Benign papillary serous cystadenoma	7
Endosalphingosis	1
Serous cyst adenofibroma	2
Normal/follicular cyst	4
Total	131
Malignant lesions	
Mucinous cystadenoma	6
Serous cystadenocarcinoma	3
Papillary serous cyastadenoma	5
Metastatic	3
Adenosquamous carcinoma arising in Dermoid	1
Large keratising squmaous carcinoma	1
Total	19

hemorrhagic cysts (5 out of 133). Most common malignant ovarian lesion was mucinous cystadenocarcinoma (6 out of 17 malignant cases) followed by papillary serous cystadenocarcinoma (5 out of 17 cases) and serous cystadenocarcinoma (3 out of 17 cases). (Table 4).

## DISCUSSION

Ovarian cancer are one of the malignancies with worst prognosis because there is lack of effective screening for early detection.<sup>6</sup> Their hidden anatomical location deep in pelvis, size, shape and histological change over a woman's lifetime make it difficult to assess and detect ovarian cancer in early stages.<sup>7</sup>

Among the ovarian masses detected by ultrasound in our study, 88% were benign and 12 % were malignant, which are comparable with studies done by Priya MHF et al<sup>8</sup>, Shraddha et al<sup>9</sup> and Jha and Karki et al.<sup>10</sup>

Mean age of ovarian malignancy was 46 years in our study which is comparable to study fone by Priya MHF et al<sup>8</sup>, Wasim et al<sup>11</sup> and Mondal et al.<sup>12</sup> Higher incidence of ovarian cancer were found in postmenopausal age group which is comparable to other studies.<sup>6, 11</sup> On the other hand, benign ovarian lesions were more common in young and reproductive age group. Most of the patients were symptomatic where as some had incidental detection of ovarian lesion on routine scan without having any

symptoms. Other studies showed finding of 7-15 % ovarian cancer patient being asymptomatic.<sup>6,11</sup> Ultrasonography is sensitive in detecting as well as distinguishing between benign and malignant ovarian mass. Our study showed a sensitivity of 78.94%, specificity of 98.47% and accuracy of 88.23% which is similar to studies done by Topez et al<sup>13</sup>, Wasim et al<sup>11</sup>, Pourissa et al<sup>14</sup>, Priya MHF et al<sup>8</sup> and Padmawati et al.<sup>15</sup>

Among histopathological subtypes, most common ovarian malignancy was mucinous cystadenocarcinoma followed by serous cystadenocarcinoma which is similar to other studies.<sup>16,17</sup> Similarly, among the benign lesions, dermoid was most common followed by serous as well as mucinous cystadenoma, endometrioma etc. which is comparable to study done by Radhamani et al.<sup>15</sup>

## CONCLUSION

Ultrasonography is initial, easily available diagnostic modality for localizing and characterizing any ovarian mass and thus very sensitive, specific and accurate at diagnosing and distinguishing benign and malignant entities. This makes further evaluation and timely management possible.

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**Authors Contribution:**

**SKC**- Concept and design of the study, manuscript preparation, reviewed the literature, critical revision of manuscript and review of the study; **AS**- Collected data and statistically analyzed and interpreted data and helped in preparing first draft of manuscript; **SK**- Literature search, statistically analyzed and interpreted data, prepared first draft of manuscript and critical revision of the manuscript; **RP**- Concept of study, collected data and review of study.

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