Original Article

A Comparison of Pelvic Examination, Pelvic Ultrasound and Operative Findings in Ovarian Masses

Sadia Khan and Sobia Nawaz

ABSTRACT

Objectives: To compare and correlate the pelvic examination in adnexal masses with pelvic ultrasound and peroperative findings.
Study Period: June 2006 to May 2007.
Study Design: Descriptive observational study.
Material and Methods: A sample set of 22 patients with adnexal masses have been included in the study to do a comparative study of the pelvic examination with pelvic ultrasound and peroperative findings.
Results: Our analysis show a wide range of diversity among the age groups of our sample set. The majority of the patients (81.8%) belong to the reproductive age group between 20-40 years and only 13% of patients are menopausal.

Another important observation is that 87% of all patients visited out patient department with sub-acute symptoms and remaining 13% presented with acute symptoms in the Emergency Department. Moreover, 54.54% have right-sided adnexal masses and the remaining 45.45% have left-sided adnexal masses. We have seen only in the 9% of cases that the operative findings are different from that of the ultrasound examination.
Conclusion: The final outcome of our research is that the ultrasound examination – an important non-invasive investigation – can only be used as a complementary method to the pelvic examination because the findings can be accurately confirmed only on laparoscopy.

INTRODUCTION

The term adnexa is derived from the pleural form of the Latin word "adnexus" which means "appendage." The adnexa of the uterus include the ovaries, fallopian tubes, and the structures of the broad ligament. Most frequently, adnexal masses refer to the ovarian masses or cysts; however, paratubal cysts, hydrosalpinx, and other non-ovarian masses are also included [1]. An adnexal mass may be found in females of all ages with significantly variable prevalence. In a random sample of 335 asymptomatic women – aged between 25 to 40 years–the prevalence of an adnexal lesion on ultrasound examination has been just 7.8 %. In comparison, the prevalence of ovarian cysts is 6.6 percent [2]. In a large screening study, the prevalence of malignant masses was 0.8 percent and benign masses were observed in 0.18%

A significant variation is observed among the patients who clinically present for adnexal masses. Some are asymptomatic other may present with an acute abdomen which can be due to infection, hemorrhage, torsion and rupture of ovarian cyst, or aruptured ectopic pregnancy. In some cases, the patients may have sub-acute symptoms (e.g. chronic ectopic pregnancy). In some instances, the ovarian masses are referred from a surgical department. In some of the presented cases, adnexal mass regressed spontaneously-50% of the simple cysts mostly resolve within a period of 6 months – and others require a surgical procedure for histological diagnosis and treatment [3].

The differential diagnosis of an adnexal mass varies from functional cysts to benign tumours to malignant tumours of various abdominal and pelvic organs [4]. The most serious concern when an adnexal mass is discovered is the possibility that it might be malignant. The characteristics that increase the likelihood of malignancy include: a solid appearing mass, ascites, appearance in a prepubescent or postmenopausal female and the presence in a woman-presented to gastroenterologist – who is known to have non gynecological cancer – breast or gastric [5]. The benign ovarian masses are usually single, soft, cystic and unilocular filled with a clear fluid. So all ovarian

masses require evaluation on the basis of history (duration of symptoms, any rapid increase in size, pressure symptoms, weight loss, anorexia) and examination (size, site, consistency, mobility, fixity to overlying skin and surrounding structures) [6].

A major effort has been made in the last two decades to improve the accuracy of the preoperative characterization of ovarian tumors on ultrasound. The main difficulty in assessing ovarian tumours lies in the wide range of their histological types and the variability of morphological features within the individual groups of tumours. The assessment of ovarian tumours is further complicated because of two factors: (1) the ovarian functional changes that occur during a woman's reproductive years, and (2) by the tumors of low malignant potential that share many features of both benign and malignant tumors [7]. The other factors that further complicate its detection are: a lack of general agreement on the description of the morphological features of ovarian tumours detected on an ultrasound scan, differences in the quality of ultrasound equipment and the varying degree of operator's expertise. Expectant management should include a repeat of physical and pelvic examination and TVS (Trans Vaginal Scan). The changes in clinical or ultrasonographic findings are characteristics of malignancy. In addition, the persistence of a significant mass is an indication of surgery. Most ovarian masses in postmenopausal women require surgical evaluation. The possible exception may be in the women, with a sub clinical cyst detected on ultrasound, which is simple, unilocular, less than 5 cm in diameter, and associated with normal serum CA 125 levels [8]. One must utilize a variety of clinical and laboratory parameters in both pre- and post-menopausal women to investigate ovarian mass, but it is important to highlight that no combination of techniques can be considered 100 percent accurate in predicting malignancy.

Once surgical removal is indicated, the question of which surgical approach to use – laparoscopy versus laparotomy – has to be decided. It is recommended that a 'risk of malignancy index' should be used to select the women for laparoscopic surgery, and it must be done by a suitably qualified surgeon. If an unsuspected ovarian malignancy is detected at the time of diagnostic laparoscopy, staging and debulking by laparotomy should be undertaken without delay and is ideally performed by a gynecologic oncologist [8].

AIMS AND OBJECTIVES

The above-mentioned dilemma provided the grist for the mill to undertake an empirical clinical study to better understand the correlation between clinical examination, ultrasonographic and operative findings. We believe that the outcome of our research will help in establishing the accuracy of different diagnostic options or their combination – an area which is till open to doing research.

MATERIAL AND METHODS

We have conducted a descriptive observational study at Benazir Bhutto Hospital (BBH), Rawalpindi – a tertiary care teaching hospital – during the time period from June 2006 to May 2007. We have included all those patients who presented with adnexal masses either in out patient department or in causality i.e. their adnexal masses not being discovered during screening for ovarian cancers. In the inclusion criteria, the reference standard was the findings of the histopathology report. In the exclusion criteria, the patients with incomplete / absent original data and the ones having no histopathology report were not included. Similarly the patients sample in which the masses were finally not proven to be adnexal – e.g. intra uterine fibroid – were excluded. We have designed a detailed data entry form – after consulting related experts – that contains relevant parameters – age, site of mass, size, mobility, consistency, fixity to the overlying skin and surrounding structures – which provide valuable information in doing a scientific analysis about the correlation between the accuracy of diagnosing ovarian masses by doing pelvic examination and ultrasound, with that of operative findings. We have done TVS of all patients by using ultrasound machine Honda 2000.

RESULTS

In our study period, we have received a total of 22 patients who had ovarian masses. We have tabulated the found correlations in Tables 1, 2, 3 and 4.

Table 1
(Relation ship of age in years with patients of ovarian masses)

Age	10-20 Years	21-30 Years	31-40 Years	41-60 Years	51-60 Years
Patients	1	9	9	2	1
%	4.54%	40.9%	40.9%	9.09%	4.54%

Table 1: This table shows that in our study that ovarian masses are most common in the reproductive age group – between 20-40 years (81.8%) – and are least common between 10-20 years (4.54%) and 51-60 years (4.54%).

Table 2
Side-wise determination of ovarian masses on clinical examination, ultrasound and per operative findings

Side Determination	Clinical	Ultrasound	Per operative
Right Mass	8(36.36%)	12(54.54%)	12(54.54%)
Left Mass	5(22.7%)	10(45.45%)	10(45.45%)
Midline Mass	8(36.36%)		

Table 2: This table shows that the right and midline ovarian masses are most common on clinical examination (33.36% each) while on the ultrasound and operative findings right adnexal masses are most common (54.54% each). The left mass is detected in just 22% on the basis of clinical findings.

Table 3
Size determination of ovarian masses on clinical examination, Ultrasound and per operative findings

SIZE	5-10 cm	11-15 cm	16-20 cm	21-25 cm	26-30 cm
Clinical	15 (68.18%)	1 (4.54%)	2 (9.09%)	2 (9.09%)	2 (9.09%)
Ultrasound	14 (63.63%)	2 (9.09%)	2 (9.09%)	2 (9.09%)	2 (9.09%)
Per operative	13 (59.09%)	3 (13.63%)	2 (9.09%)	2 (9.09%)	2 (9.09%)

Table 3 shows a 100% accuracy correlation among large masses measuring 16-30 cm between clinical examination, ultrasound examination and operative findings. But the same correlation is not found for masses of other sizes.

Table 4
Consistency of ovarian masses on clinical examination, Ultrasound and per operative findings

Consistency	Clinical Exam	Ultrasound findings	Operative findings
Solid masses	6(27.27%)	6(27.27%)	4(18.18%)
Soft/cystic Masses	16(72.72%)	16(72.72%)	18(81.18%)
Fixed Masses	5(22.7%)	4(18.18%)	6(27.27%)
Mobile Masses	17(77.27%)	18(81.18%)	16(72.72%)

Table 4: shows that there exists approximately 100% correlation in accurately determining the consistency between clinical and ultrasound examinations. However, in 3% and 9% cases the ultrasound finding could not accurately detect the consistency for fixed and mobile masses respectively.

We have further investigated the causes of ovarian mass and the conclusion is that the ectopic pregnancy is the cause in 31.81% patients and in 18.18% patients it is because the torsion of ovarian cyst; while in remaining 50% cases is due to ovarian cyst on surgery.

DISCUSSION

The adnexal mass represents a common problem in the clinical practice. Our objective is to study the correlation of pelvic examination, ultrasonography and operative findings with one another. The clinical pelvic examination provides important information regarding the status of the female genital tract as well as the abdominal processes [9]. It is common to use ultrasonography for assessment of tumors – it is readily available and has a high negative predictive value [10] – but surgery is still considered to be the most reliable method to exclude the possibility of malignancy. A recent study concurs with this view which has shown that approximately 33% of the tumors operated upon for suspected ovarian cancer happened to be benign [11].

The need for bimanual pelvic examination as part of routine gynecologic care is now being seriously criticized. The United States Department of Health and Human Services Public Health Services (in the Clinician's Handbook of Preventive Services) and the National Cancer Institute [12] do not endorse anymore the pelvic examination as a screening test for adnexal disease, particularly for ovarian cancer, because of lack of information on sensitivity, specificity, and positive and negative predictive values. According to

Russell, the pelvic examination and its possible limitations – examiner's experience, patient's obesity, patient's anxiety, or symptomatology – have never been assessed systematically [13]. In our study as far as size and consistency of mass is concerned there is correlation between bimanual examination, ultrasound and operative findings but ultrasound and per-operative findings differ from bimanual examination as far as side determination is concerned.

The findings of our study show that adnexal masses are prevalent in reproductive age group – 20-40 years (81.8%) – and 13% are menopausal. Our findings are similar to a recent study done in Maharashtra in which 73% have found to be in the reproductive age group (20-40 years), and10 (16%) are menopausal [14].

According to The American College of Obstetricians and Gynecologists 48th Annual Clinical Meeting, 50-60% ovarian masses are because of ovarian torsion while in our study they are just 18.18%. But another study – published in American Journal of obstetrics and gynecology [15] – report the rate of torsion as 7–28%.

In comparison, we see 100% agreement between ultrasonography and operative findings, if our aim is to determine the side of adnexal masses. However, the correlation between ultrasonography and operative findings reduce to 90.9% – still a high agreement between the two methods – once we consider the size of the masses. A recent study published in [16] is carried on 140 patients has reported almost similar correlation between the two methods for determining the size of adnexal masses. Another interesting observation in the study is that both types of physicians – the examiners who do bimanual pelvic examination and the sonologists who do ultrasound – show the same tendency of underestimating the adnexal size [16].

We have also successfully diagnosed 5 out of 7 patients of ectopic pregnancy (73%). This success rate is in agreement with the rate of another study – carried out at the department of Obstetrics and Gynaecology, K.E.M. Hospital, Maharashtra – which has reported it to be 70.9% [14]. It is important to emphasize that an early diagnosis of ectopic pregnancy is now possible by using serial human chorionic gonadotrophic hormone and transvaginal sonography; however, these diagnostic facilities are expensive and are non-existent in the hospitals of most developing countries.

Lawson and Albarelli [17] have outlined a number of sources that contribute towards diagnostic errors – an over interpretation of loops of bowel, technically poor examinations, misinterpretation of ectopic pregnancy, and small lesions at the lower limit of resolution. The high resolution high tech modern machines have also improved the accuracy of diagnosing adnexal masses on ultrasonography. We have observed in our study that the presence of adhesions – possibly by the inter-position of bowel loops, lateral anchoring of the adnexal, or the presence of omentum surrounding the adnexal mass – around the mass is a significant factor for diagnostic errors,. It is a well known fact that bowel gas mimics hyper-echoeic zones of a dermoid cyst [18].

CONCLUSION

We can safely conclude from our discussion that ultrasonography is definitely an important non-invasive investigation and is helpful in diagnosing most cases of functional ovarian cysts, benign ovarian neoplasm and ovarian malignancy; but the histopathological examination of specimen obtained from laparotomy or fine needle aspiration cytology of adnexal mass is the gold standard for confirming the diagnosis [19].

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AUTHORS

- **Dr. Sadia Khan**
  Department of Obstetrics and Gynaecology,
  Benazir Bhutto Hospital (BBH),
  Rawalpindi, Pakistan.

- **Dr. Sobia Nawaz**
  Department of Obstetrics and Gynaecology,
  Benazir Bhutto Hospital (BBH),
  Rawalpindi, Pakistan.