

VALIDITY OF GYNAECOLOGICAL ULTRASONOGRAPHY IN ADNEXAL MASSES

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SUMMARY

90 patients who underwent exploratory laparotomy or diagnostic laparoscopy for an adnexal mass during the period 1987-89 were included in the study. Preoperative clinical signs and ultrasound findings were compared with each other taking the surgical diagnosis as "final". The most common diagnoses encountered were ovarian tumors, tubo-ovarian masses and ectopic pregnancies. In the group presenting with *ectopic pregnancies*, ultrasonography offered definite advantage over clinical examination i.e. sensitivity 60% vs 48% specificity 95.4% vs 83.1%, positive predictive value 83.3% vs 46.2%.

However, sonography did not maintain similar advantage in the other two major groups i.e. *ovarian tumors* : sensitivity 75% vs 57.1%, specificity 79% vs 77%, positive predictive value 51.8% vs 53.3%. *Tubo-Ovarian Masses* : Sensitivity 62.% vs 54.2%, specificity 98.5% vs 98.5%, positive predictive value 94% vs. 92.9%.

In this study pelvic ultrasonography was not beneficial in the management of most patients with a known or suspected adnexal mass. However, it was useful in some cases of suspected ectopic pregnancy.

It is concluded that in a country like India with limited resources routine pre-operative ultrasonography may be safely excluded where an adnexal mass other than ectopic pregnancy is diagnosed or suspected clinically.

INTRODUCTION

Ultrasonography is considered an important diagnostic tool in present day obstetric and gynaecologic practice.

While its applications in obstetrics are well-established its routine use in gynaecology is still a matter of controversy.

Currently, there is an increasing trend towards routinely evaluating all pelvic masses preoperatively with ultrasound examination. In a country like India where hospitals are overcrowded and facilities like ultrasound units overburdened, the cost effectiveness and usefulness of such an investigation must be determined.

While Loutradis et al (1990) stated that ultrasonography is of great value in establishing a gynaecological diagnosis, Voss et al (1983)

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showed that pelvic ultrasonography was not beneficial in the management of a patient with a pelvic mass.

In the present study pre-operative ultrasound and clinical examination were compared to surgical findings in 90 patients admitted to the hospital with the diagnosis of an adnexal mass. The purpose of this comparison was to determine if routine pre-operative ultrasonography was necessary in the clinical management of these patients.

MATERIAL AND METHODS

The study group consisted of 90 patients admitted to the LNJP Hospital during the period 1987-89.

Only patients suspected to have an adnexal mass and subjected to pre-operative ultrasonography prior to diagnostic laparoscopy or exploratory laparotomy were included. Detailed clinical history and examination findings were recorded and the most probable clinical diagnosis noted.

Per abdominal scanning examinations were performed by means of full bladder technique using 3.5 MZ transducer. Follow-up of the clinical and ultrasound diagnosis was obtained by the

surgical findings. Following completion of this study both clinical and sonographic diagnosis were compared with operative diagnosis. In order to calculate the sensitivity, specificity and positive predictive value the method described by Loutradis et al (1990) was used (Table I).

These values were determined in only the three major surgical diagnostic groups of ovarian tumor, tubo-ovarian mass and ectopic pregnancy. The other groups were excluded as their numbers were too small to be of statistical significance.

RESULTS

The distribution of surgical diagnosis is shown in Table II.

The sensitivity, specificity and positive predictive value of ultrasonography vs clinical examination was as follows :

- Ovarian tumors (n = 28)
75% vs 57.1%, 79% vs 77.4%,
61.8% vs 53.3% (Table III)
- Tubo-ovarian mass (n = 24)
62.5% vs 54.2%, 98.5% vs 98.5%,
94% vs 92.9% (Table IV)
- Ectopic pregnancy (n = 25)
60% vs 48%, 95.4% vs 78.1%,
83.3% vs 46.2% (Table V)

Table - I

Illustration and definition of the sensitivity, specificity and positive predictive value (PPV) of condition X.

Findings (Clinical or ultrasound)	Operative findings	
	X Diagnosis	Other diagnosis
X Diagnosis	Truly identified (a)	Falsely identified (b)
Other diagnosis	Falsely excluded (c)	Truly excluded (d)

Sensitivity = $\frac{a}{a + c}$; Specificity = $\frac{d}{b + d}$; PPV = $\frac{a}{a + b}$

Table - II

Distribution of surgical diagnosis in 90 patients in study group

Surgical diagnosis	n
Ovarian tumours	28
Tubo ovarian mass	24
Ectopic pregnancy	25
Endometriosis	7
Broad ligament cyst.	3
Functional ovarian cyst.	2
Caecocolic mass	1

Out of 12 cases of ovarian tumour which were wrongly diagnosed on clinical examination, 7 were clinically diagnosed as tubo-ovarian mass and 5 as suspected ectopic pregnancy.

11 cases of tubo ovarian mass were clinically diagnosed as ovarian cyst in 6, hydrosalpinx in 1 and suspected ectopic pregnancy in 4.

In the ectopic pregnancy group, 3 cases which were clinically diagnosed as tubo-ovarian mass (2) and ovarian cyst (1) were correctly diagnosed on pre-operative ultrasound examination to have ectopic pregnancy.

Also, pre-operative ultrasound examination was rightly able to exclude ectopic pregnancy in 12 cases where the clinical suspicion of ectopic pregnancy was strongly entertained.

Table - III

Ovarian tumours (n 28)

Values	Ultrasound diagnosis		Clinical diagnosis	
	Number tested	%	Number tested	%
Sensitivity	21/28	75%	16/28	57.1%
Specificity	49/62	79%	48/62	77.4%
PPV	21/34	61.8%	16/30	53.3%

Table - IV

Tubo ovarian mass

Values	Ultrasound diagnosis		Clinical diagnosis	
	Number tested	%	Number tested	%
Sensitivity	15/24	62.5%	13/24	54.2%
Specificity	65/66	98.5%	65/66	98.5%
PPV	15/16	94%	13/14	92.9%

Table - V

Ectopic pregnancy

Values	Ultrasound diagnosis		Clinical diagnosis	
	Number tested	%	Number tested	%
Sensitivity	15/25	60%	12/25	48%
Specificity	62/65	95.4%	50/64	78.1%
PPV	15/18	83.3%	12/26	46.2%

DISCUSSION

While clinical ultrasound is a proven technological advance in the diagnosis of many obstetric conditions the indications for its use in evaluating a known pelvic mass are not clearly identified.

Loutradis et al (1990) while establishing the reliability of sonographic diagnosis in 705 gynaecologic patients showed that the sensitivity, specificity and positive predictive value of ultrasound examination varied between 75.93%, 93.3 - 100% and 89.7 - 100% respectively in his patients. However, he did not attempt to establish the clinical usefulness of the sonographic diagnosis as the clinical diagnosis was not considered in the study.

Levi and Delwal (1976) showed that ultrasound examination could confirm or supplement clinical examination in 80% of the 370 cases of gynaecological tumours.

De land et al (1979) suggested that all patients suspected to have a tumour of the ovary must be subjected to ultrasonography as it had more than 90% accuracy in differentiating tumours of the ovary from other types of pelvic tumours.

Wade et al (1985) cautioned that interpretation of gynaecologic sonographic findings by individuals not in the clinical practice of gynaecology was replete with mis-interpretations.

In the analysis of 900 patients he showed that ultrasonographic diagnosis could be misleading in 4.2% cases and that ultrasound examination established the diagnosis in only 59% cases.

In 1975 Queenan et al reviewed 300 consecutive gynaecologic ultrasound diagnosis and showed that in only 21% was ultrasound truly diagnostic while it was misleading in 5% cases.

The purpose of our study, however, was not to establish the accuracy of ultrasonography but to determine if routine pre-operative ultrasound was necessary in patients who were admitted for surgery based on pelvic examination finding of an adnexal mass.

In the 2 major groups of ovarian tumour and tubo-ovarian mass pre-operative ultrasonography did not offer any advantage in patient management over the pelvic examination findings. The 12 cases of ovarian tumours which were misdiagnosed on clinical examination as tubo-ovarian mass (7) and ectopic pregnancy (5) required exploratory laparotomy or diagnostic laparoscopy on the basis of the patient's clinical signs and symptoms. Similarly, 11 cases of tubo-ovarian mass diagnosed wrongly as ovarian cyst (6) hydrosalpinx (1) and ectopic pregnancy (4) required surgical intervention on the basis of the patient's presenting signs and symptoms alone.

In the group with ectopic pregnancy ultrasound examination offered some advantage over clinical

cal examination alone. 3 cases which were missed on clinical examination were correctly diagnosed on ultrasonography and immediate surgery was undertaken. 12 cases suspected to have ectopic pregnancy clinically were excluded from this group by ultrasonography. Emergency surgical intervention could have been avoided in this group.

Our findings are similar to those of Reeves et al (1980). On comparing ultrasonographic versus clinical examination in 72 patients with pelvic mass he concluded that routine ultrasonography was not necessary in the pre-operative evaluation of such a mass unless the cystic or solid nature of the mass will modify the patient's treatment.

Similarly, Voss et al (1983) stated that pelvic sonography was not beneficial in the management of patients with a known or suspected pelvic mass. In his study of 50 patients ultrasound had a false negative rate of 21% while for clinical examination the false negative rate was 16%.

From our study we found that pelvic ultra-

sound for most patients with a known adnexal mass was unnecessary and rarely altered decisions based on other clinical imperatives. Also, ultrasound is an expensive investigation and routine use of this in a country already burdened with patient over-crowding and severe financial constraints is condemned.

It is concluded that routine ultrasound examination is better avoided where the patient presenting with an adnexal mass will require some form of surgical exploration, irrespective of the ultrasound findings.

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