TO EVALUATE THE ROLE OF MAGNETIC RESONANCE IMAGING (MRI) IN PELVIC MASSES IN FEMALE PATIENTS

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Article Info: Received 16 December 2020; Accepted 24 January 2021

DOI: <https://doi.org/10.32553/ijmbs.v5i1.1832>

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Conflict of interest: No conflict of interest.

Abstract

Background & Method: Study was conducted at Medcity Institute of Medical Sciences, Medchal, Telangana number of cases studied 30. All clinically suspected female patients with pelvic masses referred to the Department of Radio-diagnosis were evaluated. These patients were first subjected to Ultrasonography followed by MRI (plain and contrast where ever required). MRI findings were compared with that of Ultrasonography. These findings were compared with that of operative findings and histopathological findings wherever performed.

Result: Majority of uterocervical lesions on MRI were malignant in nature. One case of endometrial polyp in usg, diagnosed as stage Ib endometrial carcinoma, and cervical fibroid was diagnosed as cervical carcinoma stage II, on MRI 2cases of cervical and 2 cases of endometrial carcinoma.

Conclusion: In practice USG is the primary modality for diagnosing the pelvic mass. MRI is superior to ultrasound and can be used as problem solving tool in the assessment of pelvic mass. The multiplanar imaging capability allows accurate identification of origin of mass, characterization of mass(solid, haemorrhagic, fatty and fibrous contents). This may obviate surgery or significantly contribute to the preoperative planning of pelvic mass

Keywords: Magnetic Resonance Imaging, pelvic & female.

Study Designed: Observational Study

Introduction

Anatomically, the pelvis includes sigmoid colon, the rectum, the urinary bladder & the urethra and female genital organs. In female pelvis the differential diagnosis of pelvic mass is quite variable because abnormality may arise from gynaecological or non gynaecological origin

Gynaecological masses are either uterine or adnexal. Adnexal region is composed of ovary, fallopian tube, broad ligament, and associated blood and nerve supply. While non gynaecological pelvic masses are those arising from bladder, ureter, rectum, colon, blood vessels and nerves in the pelvis(1).

Ultrasound is primary imaging modality for diagnosing the pelvic mass lesions. It is non invasive, inexpensive, easily available and free of ionizing radiation, Ultrasound confirms the presence of masses, differentiating ovarian masses from tubal or uterine origin, delineating the internal appearance of masses and defining other abnormal findings.

Main disadvantage of ultrasound is that the field of view is limited, sometimes bowel gas obscures the pelvic organs. It is possible to suspect malignancy on the basis of ultrasound image but definite diagnosis cannot always be made. Ultrasonography may be limited by its decreased specificity for the diagnosis of solid benign masses(2).

Magnetic resonance imaging is much better in delineating and diagnosing the pelvic lesions where usg is equivocal.

The T2 weighted images are much better for the soft tissue contrast and to characterize the abnormalities(3). The T1 weighted images and fat saturated sequences are used to demonstrate the fat content of lesions. Recent development of fast spin echo sequences along with new phased array coils have enabled higher resolution images in shortened imaging times. The result is improved characterization of masses which leads to specific diagnosis(4).

Material & Method

Study was conducted at Medcity Institute of Medical Sciences, Medchal, Telangana from period of study July 2012 to June 2015. Number of cases studied 30. All clinically suspected female patients with pelvic masses referred to the Department of Radio-diagnosis were evaluated. These patients were first subjected to Ultrasonography followed by MRI (plain and contrast where ever required). MRI findings were compared with that of Ultrasonography. These findings were compared with that of operative findings and histopathological findings wherever performed.

USG studies were performed by using multifrequency linear curvilinear and transvaginal transducers. USG studies were performed on PHILIPS ENVISOR, HD7 machines.

MRI studies were performed on 1.5 Tesla PHILLIPSACHIVEA scanner.

Inclusion Criteria

All female patients with suspected genitourinary pelvic masses were included

Exclusion Criteria

All female patients with suspected non genitourinary pelvic masses were excluded.

Results

Table 1: age distribution (N=30)

S. No.	Age of the patient	No of patients (%)
1	5-20	3
2	21-40	12
3	41-60	09
4	61-80	06
Total		30

Majority of the patients were of 21-40yr age group

Table 2: anatomical distribution of the lesions on USG (N=30)

S. No.	Origin of the lesion	No of patients (%)
1	Uterus	10
2	Ovary	13
3	Fallopian tube	04
4	Broad ligament	01
5	Urinary bladder	02

Majority of the lesions on USG were ovarian in origin 13

Table 3: type of uterocervical lesions on MRI(N=9)

S. No.	Type of lesion	No of patients
1	Benign	05
2	Malignant	04

Majority of uterocervical lesions on MRI were malignant in nature. One case of endometrial polyp in usg, diagnosed as stage Ib endometrial carcinoma, and cervical fibroid was diagnosed as cervical carcinoma stage II, on MRI 2cases of cervical and 2 cases of endometrial carcinoma

Table 4: validity of USG in diagnosis of female pelvic malignancy (N=30)

USG \ MRI	USG		TOTAL
	POSITIVE FOR MALIGNANCY	NEGATIVE FOR MALIGNANCY	
POSITIVE FOR MALIGNANCY	7 (TP)	2 (FP)	09
NEGATIVE FOR MALIGNANCY	1 (FN)	20 (TN)	21
TOTAL	08	22	30

SENSITIVITY (TP/TP+FN) X100 =87.5%

SPECIFICITY (TN/TN+FP) X100 =90.9%

Discussion

MRI pelvis is more useful in evaluating pelvic mass as a problem solving tool for the origin of the mass, which is an

essential first step, accurate tissue characterization, was the second essential step of characterizing an adnexal mass(5).

These steps were suboptimal for sonography and excellent for MRI (1). The most common origin of pelvic mass is ovary as quoted by Adusumilli et al(1) which was 56% as comparable to present study which was 46.6% (12 cases on mri) Results of study conducted by are Adusumilli et al(1) is the sensitivity of MRI for identifying malignancy was 100% and its specificity for benignity was 94%. In present study, sensitivity of MRI for identifying malignancy was 100% and its specificity for benignity was 100%

Accuracy of MR imaging in the detection and characterization of adnexal mass lesions with a sensitivity of 95% and specificity of 88% was depicted in a study conducted by Aslam Sohaib et al(6).

In the present study we found that MR imaging in the detection and characterization of adnexal masses with a sensitivity of 100% and specificity of 100% which signifies that MR Imaging is highly accurate in the characterization of adnexal mass lesions(7&8).

In a study conducted, the benign adnexal masses were maximum in the age group 20 - 39 years 57.7%, while malignant masses were mainly found in women ≥60 years of age 64.7%(9). On MRI, the sensitivity for the mass of ovarian origin was 97.7%. In present study, sensitivity of MRI in diagnosis mass of ovarian origin is 100%(10).

Conclusion

In practice USG is the primary modality for diagnosing the pelvic mass. MRI is superior to ultrasound and can be used as problem solving tool in the assessment of pelvic mass. The multiplanar imaging capability allows accurate identification of origin of mass, characterization of mass (solid, haemorrhagic, fatty and fibrous contents). This may obviate surgery or significantly contribute to the preoperative planning of pelvic mass.

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