|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
*Index Copernicus Value 2018: 75.71*
Original Research Article
Volume 4, Issue 6; June: 2020; Page No. 103-105

# TO SEPARATELY ASSESS THE DIAGNOSTIC POTENTIAL OF TVS & MRI IN THE TERMS OF SENSITIVITY AND SPECIFICITY BY CORRELATING THE IMAGING FINDINGS WITH HISTOPATHOLOGY

**Dr. Suraj Mathur**[1]
[1]Senior Resident, Department of Radio Diagnosis, Govt. Medical College, Kozhikode, Kerala, India

**Article Info:** Received 03 May 2020; Accepted 15 June 2020
**DOI:** https://doi.org/10.32553/ijmbs.v4i6.1209
**Corresponding author:** Dr. Suraj Mathur
**Conflict of interest:** No conflict of interest.

**Abstract**
This prospective study was done in the Department of Radio diagnosis Govt. Medical College, Kozhikode. A total of 65 patients who were referred to our department with clinical suspicion of endometrial lesions and incidentally detected endometrial lesions on ultrasonography underwent transvaginal ultrasound and subsequent Imaging evaluation of pelvis MRI has very high sensitivity (95%) and specificity (98%) and is almost as accurate (97%) as histopathology in differentiating benign from malignant lesions. Addition of DWI with ADC mapping to conventional MRI increases its accuracy even more. However there is inherent limitation to MRI in detecting carcinoma in situ and micrometastasis.
**Keywords:** TVS, MRI, Sensitivity, Specificity, Histopathology.

## Introduction

### MR IMAGING OF FEMALE PELVIS

Magnetic resonance imaging (MRI) is a commonly used technique in the workup of obstetric and gynecologic abnormalities and in the pre- and postprocedural evaluation for uterine artery embolization. [1]

### MRI techniques

Optimal MRI of the female pelvis and uterus should be performed on a high field-strength MRI system that uses local phased-array coils. The typical imaging protocol for the uterus includes both T1-weighted (T1W) and T2-weighted (T2W) images. Axial T1W images are obtained to evaluate the uterine contour, lymph nodes, and bone marrow. Fat-suppressed T1W imaging is used to differentiate between pelvic masses that contain fat and those that contain protein or haemorrhage[2]. Contrast enhancement is used to determine the extent of endometrial carcinoma invasion or to detect the presence of necrosis in uterine leiomyoma.

In this study, we have attempted to evaluate endometrial lesions by TVS and MRI for better tissue delineation and the same was confirmed by histopathological correlation. Also, the specificity and sensitivity of TVS and MRI are separately assessed in the diagnosis of the endometrial lesions and combination of these two imaging modalities for accurate diagnosis of various endometrial lesions was done especially in suspected endometrial malignancies. [3]

## Material & Method

This prospective study was done in the Department of Radio Diagnosis Govt. Medical College, Kozhikode. A total of 65 patients who were referred to our department with clinical suspicion of endometrial lesions and incidentally detected endometrial lesions on ultrasonography underwent transvaginal ultrasound and subsequent Imaging evaluation of pelvis using 1.5 T MRI scanner from July 2018 to June 2019. Diagnosis was confirmed by Histopathology. The data was analyzed by calculating the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of the techniques.

### INCLUSION CRITERIA

1. Patients referred to the department of Radio diagnosis, MGMMC Indore for radiological evaluation of abnormal uterine bleeding.
2. All Patients detected to have endometrial lesions on transabdominal ultrasound.
3. Patients of above the age of 18 years

### EXCLUSION CRITERIA

1. Patients who have previously undergone endometrial resection/ ablation
2. Patients with intrauterine contraceptive devices
3. Patients with pregnancy and related causes of vaginal bleeding
4. Patients with active genital infections
5. Unmarried female patients.
6. Severe medical conditions precluding study like uncontrolled Hypertension, Diabetes mellitus, bleeding disease.
7. General contraindications to MRI

### HISTOPATHOLOGICAL ANALYSIS

All patients in the study underwent Histopathological examination for confirmation of diagnosis {histology

obtained from inpatient sampling (hysterectomy, directed biopsy, D&C)}.

**Results**

**TVS VS HPE**

**Table 1:** TVS VS HPE

| MODALITY/DIAGNOSIS | TVS | HPE |
|---|---|---|
| SYNECHIAE | 2 | 2 |
| ENDOMETRITIS | 10 | 7 |
| POLYP | 6 | 4 |
| ENDOMETRIAL HYPERPLASIA | 19 | 18 |
| MALIGNANT | 16 | 22 |
| SUBMUCOSAL FIBROID | 7 | 6 |
| ADENOMYOSIS | 5 | 6 |
| TOTAL | 65 | 65 |

**STATISTICAL ANALYSIS OF TVS IN BENIGN CONDITIONS**

**Table 2:** STATISTICAL ANALYSIS OF TVS IN BENIGN CONDITIONS

| | HPE BENIGN | HPE NON BENIGN | TOTAL |
|---|---|---|---|
| TVS BENIGN | 40(TP) | 9(FP) | 49 |
| TVS NON BENIGN | 3(FN) | 13(TN) | 16 |
| TOTAL | 43 | 22 | 65 |

| | |
|---|---|
| SENSITIVITY | 93 % |
| SPECIFICITY | 59 % |
| POSITIVE PREDICTIVE VALUE | 82% |
| NEGATIVE PREDICTIVE VALUE | 81% |
| ACCURACY | 82 % |

**Table 3:** STATISTICAL ANALYSIS OF TVS IN MALIGNANT CONDITIONS

| | HPE POSITIVE | HPE NEGATIVE | TOTAL |
|---|---|---|---|
| TVS POSITIVE | 13(TP) | 3(FP) | 16 |
| TVS NEGATIVE | 9(FN) | 40(TN) | 49 |
| TOTAL | 22 | 43 | 65 |

| | |
|---|---|
| SENSITIVITY | 59% |
| SPECIFICITY | 93% |
| POSITIVE PREDICTIVE VALUE | 81% |
| NEGATIVE PREDICTIVE VALUE | 82% |
| ACCURACY | 82 % |

**Table 4:** STATISTICAL ANALYSIS OF MRI (MORPHOLOGY PLUS DWI & ADC) IN BENIGN CONDITIONS

| | HPE BENIGN | HPE NON BENIGN | TOTAL |
|---|---|---|---|
| MRI BENIGN | 42(TP) | 1(FP) | 43 |
| MRI NON BENIGN | 1(FN) | 21(TN) | 22 |
| TOTAL | 43 | 22 | 65 |

| | |
|---|---|
| SENSITIVITY | 98% |
| SPECIFICITY | 95% |
| POSITIVE PREDICTIVE VALUE | 98% |
| NEGATIVE PREDICTIVE VALUE | 95% |
| ACCURACY | 97 % |

**Discussion**

MRI is now being widely used as an optimal imaging modality as it is non-invasive, has no risk of radiation, and is fewer operators dependent. MRI excels in delineating the anatomy and characterization of the pelvic lesions. In this study diffusion-weighted imaging (DWI) with ADC has been applied to pelvic MRI protocol.

Majority (46%) of the patients in our study belonged to the age group of 50 to 59 years. Most of the cases of the endometrial hyperplasia and malignancies were detected in this age group. This is in accordance with the previous studies. In a population based study Shady MS et al in 2016 [4] found that the incidence of endometrial hyperplasia with and without atypia peaks in the early postmenopausal years and in early 60's.According to the study of Billingsley CC in 2015 [5] endometrial hyperplasia was most frequent in perimenopausal age group.

The most common presenting complaint of the patients in our study was abnormal uterine bleeding followed by discharge PV, followed by pelvic pain. This is in accordance with the study of Bakir B 2017[6]

On TVS out of 65 cases 34 cases (52%) had heterogenous echotexture and 31 cases (48%) had homogenous echotexture. Lesions with heterogenous echotexture were suspicious for non benign and inflammatory causes. This is according to the study of Mourad MA et al in 2016[7] that a heterogenous echogenicity of endometrium was significantly more common in malignant than benign endometrium.

On MRI TWI 17 cases (26%) were hypointense, 3 cases (5%) were hyperintense, 23 cases (35%) were heterogenous and 22 cases (34%) were isointense. on T2WI, 26 cases (40 %) were hypointense, 5 cases (8%) were hyper intense, 23 cases (35%) were heterogenous and 11 cases (17 %) were isointense. This is in accordance with the study of Elsammak A in 2017[8] which showed lesions with hypointense signals at T1WI, heterogeneous signals at T2WI were probably malignant, while those that displayed hypointense signals on T1W images, hyperintense signals on T2W images were probably benign.

**Conclusion**

MRI has very high sensitivity (95%) and specificity (98%) and is almost as accurate (97%) as histopathology in differentiating benign from malignant lesions. Addition of DWI with ADC mapping to conventional MRI increases its accuracy even more. However there is inherent limitation to MRI in detecting carcinoma in situ and micrometastasis.

## References

1. Shobhitha GL, Kumari VI, Priya PL, Sundari BT. Endometrial study by TVS and It's correlation with histopathology in abnormal uterine bleeding. J Dental Med Sci. 2015;14(4):21-32.
2. Sala E. Magnetic resonance imaging of the female pelvis. In Seminars in roentgenology 2008 Oct 1 (Vol. 43, No. 4, pp. 290-302). Elsevier.
3. Davis PC, O'Neill MJ, Yoder IC, Lee SI, Mueller PR. Sonohysterographic findings of endometrial and subendometrial conditions. Radiographics. 2002 Jul;22(4):803-16.
4. Shady MS, Bakry MA, Mazroa JA, Gadelhak BN. MR diffusion imaging in preoperative evaluation of depth of myometrial invasion in endometrial carcinoma. The Egyptian Journal of Radiology and Nuclear Medicine. 2016 Jun 1;47(2):611-9.
5. Billingsley CC, Kenne KA, Cansino CD, Backes FJ, Cohn DE, O'malley DM, Copeland LJ, Fowler JM, Salani R. The use of transvaginal ultrasound in Type II endometrial cancer. International Journal of Gynecological Cancer. 2015 Jun 1;25(5):858-62.
6. Bakir B, Sanli S, Bakir VL, Ayas S, Yildiz SO, Iyibozkurt AC, Kartal MG, Yavuz E. Role of diffusion weighted MRI in the differential diagnosis of endometrial cancer, polyp, hyperplasia, and physiological thickening. Clinical imaging. 2017 Jan 1;41:86-94.
7. Mourad MA. Approach of multi-slice computed tomography (MSCT) in assessment of transcatheter aortic valve implantation (TAVI). The Egyptian Journal of Radiology and Nuclear Medicine. 2016 Jun 1;47(2):421-30.
8. Elsammak A, Shehata SM, Abulezz M, Gouhar G. Efficiency of diffusion weighted magnetic resonance in differentiation between benign and malignant endometrial lesions. The Egyptian Journal of Radiology and Nuclear Medicine. 2017 Sep 1;48(3):751-9.