

ORIGINAL ARTICLE

Comparison of Degree of Agreement Between MRI and Histopathology in T Staging of Cervical Carcinoma

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ABSTRACT

Introduction: Cervical cancer is a prevalent malignancy that has a high death and morbidity rate. It's caused by aberrant cell proliferation with the capacity to infiltrate and spread to other portions of the body.

Objective: The main objective of the study is to compare the degree of agreement between MRI and histopathology in T staging of cervical carcinoma.

Material and Methods: This cross sectional study was conducted in the department of radiology, Mayo Hospital Lahore for 6 months i.e. 12 Feb 2019 to 11 Feb 2020. MRI of the pelvis performed using a 1.5 tesla MRT 1580 scanner. All the results were interpreted by our senior radiologist and T-stage was noted according to MRI findings. All histopathological examinations performed. Both MRI and histopathology were separately place.

Results: The mean age of patients was 46.45±13.38 years, 25(25%) patients were with underweight BMI and obese BMI patients were 36(36%). In our study the agreement between the MRI and histopathology was found in 77(77%) patients.

Conclusion: According to our study results the MRI had good agreement with histopathology in T staging of cervical carcinoma.

INTRODUCTION

Cervical cancer is a prevalent malignancy that has a high death rate and a high morbidity rate. Because the treatment technique selected and prognosis rely on clinical findings and radiologic stage at presentation, accurate preoperative staging is the most critical aspect in identifying effective therapy of cervical cancer.¹ Various diagnostic methods including bimanual examination with the patient anesthetized, biopsy, computed tomography and magnetic resonance imaging are being used for preoperative staging of cervical carcinoma.²

Shweel et al. found that MRI had varying diagnosis accuracy for various tumour stages. Stage IB had 100% MRI characteristics, stage IIA had 83 percent, stage IIB had 75 percent, and stage IV had 100 percent. In stages IB and IVA, MRI staging of cervical cancer was consistent with histopathologic staging, but in stages IIA and IIB, it was over-staging.³

Magnetic resonance imaging has good soft tissue resolution and multiplanar capabilities and this accompanied by recent advances in Magnetic resonance imaging has results in more accurate staging. According to Balkes et al, apparent diffusion coefficient magnetic resonance imaging has an important role in diagnosis and preoperative assessment in differentiating different stages of cervical carcinoma.⁴⁻⁷

The capacity to establish the presence of muscle invasion and extra cervical disease is a clear benefit of MRI over CT, and it is the recommended modality for local T staging prior to definitive drastic therapy for muscle invasive cervical cancer. The diagnostic performance of MRI for pre-treatment evaluation and T-staging of cervical cancer will be evaluated in this research. According to the literature, magnetic resonance imaging (MRI) is now one of the most reliable preoperative staging modalities for cervical cancer and helps doctors choose the right kind of surgery.⁸Invasive procedures like cystoscopy and

proctoscopy are no longer necessary thanks to MRI. By assessing tumour size, parametrial invasion, and lymph node status, it is an essential technique in cervical cancer staging to differentiate early illness (stage IIA) from advanced disease (stage IIB or more).⁹Although MRI is becoming more often used for preoperative staging of uterine cervical cancer, it is still not considered a gold standard. Unfortunately, owing to a lack of knowledge, the use of MRI in the staging of cervical cancer is low in Pakistan; also, no local investigation on the diagnostic accuracy of MRI in the evaluation and staging of cervical carcinoma is available.¹⁰⁻¹²

Objective: The main objective of the study is to compare the degree of agreement between MRI and histopathology in T staging of cervical carcinoma.

MATERIAL AND METHODS

This cross sectional study was conducted in the department of radiology, Mayo Hospital Lahore for 6 months i.e. 12 Feb 2019 to 11 Feb 2020. MRI of the pelvis performed using a 1.5 tesla MRT 1580 scanner. Sample size of 100 cases was calculated with 95% confidence level, 8% margin of error and taking expected percentage of agreement.

Inclusion Criteria:

1. Gender female with age group 25 to 70 years with diagnosis of cervical carcinoma referred from other departments for MRI staging.
2. Patients with early cervical carcinoma planned for primary surgery.

Exclusion Criteria:

1. Patients who underwent preoperative long-course radiotherapy or chemotherapy.
2. Patients who underwent primary surgery or having history of recurrence.

3. Patients with implanted cardiac prostheses, metallic cardiovascular electronic devices, intravascular stent and filters, cochlear implants, bullets.

Data Collection Procedure: 100 patients referred from the departments of Sir Ganga Ram Hospital Lahore for MRI t-staging of cervical carcinoma and fulfilling the inclusion criteria was included in this study. Informed consent was taken from the patients. The demographic information like name, age and address was obtained. MRI of the pelvis performed using a 1.5 tesla MRT 1580 scanner (Toshiba Excerlart Vantage). A compliant cervical cancer imaging protocol included T1, T2 weighted, FAT SAT and contrast enhanced sequences in the sagittal, axial and coronal planes. All the results were interpreted by our senior radiologist and T-stage was noted according to MRI findings. All histopathological examinations performed by a single histopathologist. Both MRI and histopathology were separately place the patients in one of the T-stage of the disease using TNM staging system for cervical carcinoma. All information was collected through specially designed performa.

Data Analysis: Data was entered and analyzed by using SPSS software version 14. Continuous variable like age was presented as mean + standard deviation. Categorical variable like agreement between MRI and histopathology for the T-staging of cervical carcinoma was presented as frequency and percentage.

RESULTS

In this present study total 100 cases participated. The mean age of the patients was 46.45±13.38 years with minimum and maximum ages of 25 & 70 years respectively. In our study 25(25%) patients were with underweight BMI, the patients with normal BMI were 39(39%) and the overweight and obese BMI patients were 36(36%).

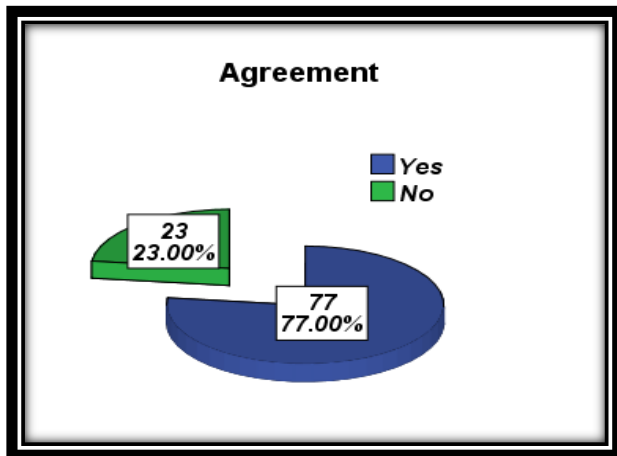


Fig 1: Frequency distribution of agreement between MRI and Histopathology

In this study the MRI report diagnosed stage T-1 in 32(32%) patients, T-2 stage was diagnosed in 24(24%) patients, T-3 stage diagnosed in 18(18%) patients and T-4 stage diagnosed by MRI in 26(26%) patients. The study results showed that the histopathology report diagnosed

stage T-1 in 26(26%) patients, T-2 stage was diagnosed in 24(24%) patients, T-3 stage diagnosed in 27(27%) patients and T-4 stage diagnosed by histopathology in 23(23%) patients.

Table 1: Frequency distribution of outcome MRI with histopathology

		Histopathology				Total
		T-1	T-2	T-3	T-4	
MRI	T-1	23	5	2	2	32
	T-2	1	18	5	0	24
	T-3	1	0	16	1	18
	T-4	1	1	4	20	26
Total		26	24	27	23	100

Measure of agreement Kappa=0.694
Approximate p-value=0.000*

Out of 100 patients the agreement between the MRI and histopathology was found in 77(77%) patients and it was not found in 23(23%) patients. In this study by applying Kappa statistics a good agreement was observed between the MRI and histopathology. i. e Kappa statistics=0.694.

Table 2: Comparison of agreement with age (years)

		Agreement		Total
		Yes	No	
Age (years)	≤ 50	50	11	61
	> 50	27	12	39
Total		77	23	100

Chi value=2.18
p-value=0.140 NS

Table 3: Comparison of agreement with BMI

		Agreement		Total
		Yes	No	
BMI	Under weight	19	6	25
	Normal	32	7	39
	Overweight & Obese	26	10	36
Total		77	23	100

Chi value=1.040
p-value=0.595 NS

The study results showed that ≤ 50 years patients were 61 in which agreement was found in 50 cases and it was not found in 11 cases, similarly the >50 years patients were 39 in which agreement was noted in 27 cases and it was not found in 12 cases. Statistically insignificant difference was found between the agreement of MRI and histopathology with age. i. e p-value=0.140.

The study results showed that underweight BMI patients were 25 in which agreement was found in 19 cases and it was not found in 6 cases, normal BMI patients were 39 in which agreement was noted in 32 cases and it was not found in 7 cases, similarly in overweight and obese BMI patients were 36 in which agreement was noted in 26 cases and it was not found in 10 cases. Statistically insignificant difference was found between the agreement of MRI and histopathology with BMI. i. e p-value=0.595.

DISCUSSION

The purpose of this cross-sectional research was to investigate the degree of concordance between MRI and

histology in T staging of cervical cancer at Sir Ganga Ram Hospital Lahore/Fatima Jinnah Medical College. Cervical cancer is the third most frequent cancer in women all over the globe.¹³ In order to establish the best treatment approach, accurate disease staging is essential. Cervical cancer is a leading cause of mortality worldwide, particularly in Third World nations where Pap smear screening is not frequently conducted. The size and histological grade of the tumour are important prognostic variables. In order to maximise the therapy plan for patients with cervical cancer, magnetic resonance imaging (MRI) is commonly used in the preoperative evaluation.¹⁴

In our study the agreement between the MRI and histopathology was found in 77(77%) patients. In this study by applying Kappa statistics a good agreement was observed between the MRI and histopathology. i. e Kappa statistics=0.694.¹⁵⁻¹⁸ The findings of some of the studies are given here, demonstrating that MRI is the ideal imaging modality for assessing the local extent of cervical cancer due to its high contrast resolution, which allows for discrimination between malignant and normal tissues. For assessing tumour extension to the corpus uteri, MRI is safe, with high sensitivity (86 percent-91 percent) and specificity (94 percent-96 percent) values.¹⁹⁻²²

Inter-observer agreement on tumour stage was typically excellent (K = 0.68–0.78) for patients without previous cone biopsy to MRI, according to a research by Sahdev A et al. Patients who had done cone biopsies prior to MRI had moderate to excellent agreement (K = 0.58–0.62). Conized patients had a greater sensitivity for identifying tumour existence than non-conized patients (57 percent vs 43 percent), while specificity was 94 percent versus 100 percent.²³

Kraljevi Z et al. conducted a research. The surgical technique was performed on chosen patients, and the linkage of clinical results based on FIGO classifications, MRI, and histological findings was conducted. They discovered that MRI was more accurate than clinical examination in staging cervical cancer, with 90.9 percent against 79.0 percent accuracy.²⁴⁻²⁵

CONCLUSION

It is concluded that the MRI had good agreement with histopathology in T staging of cervical carcinoma.

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