ORIGINAL ARTICLE

Accuracy of MRI for Diagnosis of Acute Invasive Fungal Sinusitis Taking Histopathology as a Gold Standard

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ABSTRACT

Aim: Diagnostic accuracy of MRI for diagnosis of acute invasive fungal sinusitis by taking histopathology as gold standard
Study design: Cross sectional study at Radiology department, Ittefaq Hospital Lahore
Duration: Six months from 23-02-2018 to 23-08-2018
A total of 346 cases fulfilling inclusion & exclusion criteria were taken. All cases were done MRI procedure. Histopathology reports were also obtained. The results obtained were used to calculate the diagnostic accuracy.
Results: The male were 195(56.4%) and female were 151(43.6%). On histopathology, 120(34.7%) cases showed positive results. By MRI study, 114(32.9%) cases were of positive finding. The sensitivity, specificity, positive and negative predictive value of MRI was 90%, 97.4%, 94.7% and 94.8% respectively and diagnostic accuracy of MRI was 94.8%.
Conclusion: For diagnosing acute invasive fungal sinusitis, there is high diagnostic accuracy of MRI taking histopathology as gold standard.
Keywords: sinus fungal infection, histopathology, MRI

INTRODUCTION

Fungal sinusitis has two types: noninvasive and invasive types. These are labeled by the absence or presence of fungal invasion in surrounding tissues[1]. The noninvasive types are saprophytic fungal infestation, fungal ball, and allergic fungal rhinosinusitis and invasive types are: acute invasive fungal rhinosinusitis, chronic invasive fungal rhinosinusitis, and granulomatous invasive fungal rhinosinusitis[2]. In immune deficiency cases, acute invasive fungal sinusitis has marked morbidity and mortality[3]. The incidence of fungal infection is 39%[4] and standard method for diagnosing fungal infection is histopathological procedure[5].

The objective of the study was to find out diagnostic accuracy of MRI for diagnosis of acute invasive fungal sinusitis by taking histopathology as gold standard

METHODOLOGY

It is a cross sectional survey with duration of six months i.e. 23-02-2018 to 23-08-2018. It is done at Radiology Department, Ittefaq Hospital, Lahore.
Selection criteria: Cases aged 16-70 years with either sex and suspected Invasive fungal sinusitis were included. Cases with H/o nasal deformities, H/O sinus surgery and pregnant and lactating females were excluded. A total of 346 cases were taken after taking informed consent. All cases were done MRI and histopathology reports were also obtained. Data was analyzed using SPSS 20 version. Post stratified diagnostic accuracy and Chi-square test was applied.

RESULTS

Table 1: Diagnosis on Histopathology and MRI WRT age

Age (yrs)	Diagnosis on MRI	Diagnosis on Histopathology		Total
		+ve	-ve	
16-40	+ve	46	03	49
	-ve	05	88	93
41-70	+ve	62	03	65
	-ve	07	132	139

Table 1A:

	Age (Yrs)	
	16--40	41—70
Sensitivity	90.2%	89.9%
Specificity	97.7%	97.8%
PPV	93.9%	95.4%
NPV	94.6%	94.9%
Diagnostic accuracy	94.4%	95.1%

Table 2: Diagnosis on Histopathology and MRI WRT gender

Gender	Diagnosis on MRI	On Histopathology		Total
		+ve	-ve	
Male	+ve	60	04	64
	-ve	06	125	131
Female	+ve	41	02	50
	-ve	06	95	101

Table 2A:

	Gender	
	Male	Female
Sensitivity	90.9%	88.9%
Specificity	96.9%	97.9%
PPV	93.8%	96%
NPV	95.4%	94.1%
Diagnostic Accuracy	94.9%	94.7%

DISCUSSION

Acute fulminant invasive fungal sinusitis (AFIFS), a rare disease, is mostly affecting immune deficient[7]. In this study, the sensitivity, specificity, positive and negative predictive value of MRI was 90%, 97.4%, 94.7% and 94.8% respectively and diagnostic accuracy (DA) of MRI was 94.8%. A study done by Groppo ER et al[1] showed sensitivity, specificity, PPV and NPV of MRI 86%, 83%, 94% and 100%. These results are consistent with our study. Another retrospective case-control study was done to see radiographic findings of CT and MRI in AFIFS cases. This study showed that MRI is more sensitive at diagnosing AFIFS than CT. The most sensitive and specific single parameter evaluated was extra sinus invasion[8]. CT findings in invasive fungal rhinosinusitis may underestimate the disease extent. MRI showed progression of disease in a better way and considered early for diagnosis[6].

CONCLUSIONS

For diagnosing acute invasive fungal sinusitis, there is high diagnostic accuracy of MRI taking histopathology as gold standard.
Conflict of interest: Nil

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