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Original Research Article

To Study the Occurrence of Knee Injuries Following Trauma by MRI: An Institutional Based Study

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ABSTRACT

Background: MRI helps in early diagnosis and success of surgical inventions in ligament injuries which makes this modality of choice for detection of ligament injuries and marrow abnormalities. The present study was conducted to study the occurrence of knee injuries following trauma by MRI.

Materials and Methods: This cross-sectional study was conducted among 140 patients having knee injury over a period of 6 months. MRI of the knee was performed. The knee was imaged in three standard planes i.e. coronal, axial and sagittal planes. The various MRI findings were recorded. The statistical analysis was done using computer assisted statistical software SPSS Package Version - 20. Probability was calculated at 0.05 level of critical significance.

Results: In the present study total patients were 140, among them 81.42% were males and 18.57% were females. So, in this study the distribution of knee injury was prevalent in males. The majority of the patients were young aged between 21-35 years (57.14%). Males continued to show increased incidence of ACL tears, PCL tears, MM tears, MCL tears and joint effusion in the study.

Conclusion: This study concluded that with the help of Magnetic resonance imaging knee injury found to be prevalent in males and in the age group 21-35 years. Incidence of ACL tears, PCL tears, MM tears, MCL tears and joint effusion were found to be more in males than females.

Keywords: Knee Injury, MRI, ACL Tears, PCL Tears.

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INTRODUCTION

The knee joint is a biggest joint of the human body with complex articulation characterized by the presence of ligamentous and meniscal structures that play an important role in the stability and mobility.[1] Being one of the most important weight bearing joints, knee is capable of performing complex and extensive movements, it is therefore susceptible and frequently affected by traumatic and degenerative conditions.[2,3]

Early detection of knee injuries is extremely important to prevent long-term consequences of delayed treatment.[4] The primary imaging modality for traumatic injuries is Radiography, it is used to detect the onset of joint degeneration post trauma.[5,6] Magnetic resonance imaging (MRI) has now been accepted as the best imaging modality for non-invasive evaluation of knee injuries. It has been reported to have a high diagnostic accuracy and does not involve the use of ionizing radiation.[7]

MRI has proved reliable, safe and offers advantages over diagnostic arthroscopy, which is currently regarded as the reference standard for the diagnosis of internal derangements of the knee.[8] It provides excellent soft tissue contrast and is capable of evaluating the soft tissue and bony structures in multiple imaging planes which provide significant advantages over other imaging techniques. It represents a non-invasive and radiation-free technique that provides access to a real "lesional mapping".[9] The present study was conducted to study the occurrence of knee injuries following trauma by MRI.

MATERIALS AND METHODS

This cross-sectional study was conducted among 140 patients having knee injury over a period of 6 months. Before the commencement of the study ethical approval was taken from the institute and informed consent was obtained from the patients. All the patients with knee injury, referred for MRI evaluation were included in the study. Patients with neoplasm, infective or inflammatory pathologies of knee, post-operative cases and those having contraindications to MRI were excluded from the study.

The patient was placed in supine position, feet first with full extension and the knee externally rotated 15-20 degree to

facilitate the proper visualization of anterior cruciate ligament (ACL) completely on sagittal images. The knee was imaged in three standard planes i.e. coronal, axial and sagittal planes using T1W, T2W, PD, PD FS, STIR (proton density, proton density fat saturation, short tau inversion recovery) sequences with 4 mm slice thickness. The various MRI findings were recorded. The statistical analysis was done using computer assisted statistical software SPSS Package Version - 20. Statistical test used was Chi-square test for proportions. Probability was calculated at 0.05 level of critical significance.

Table 1: Distribution according to gender

Gender	N (%)
Male	114(81.42%)
Female	26(18.57%)
Total	140(100%)

Table 2: Distribution according to age group

Age group (yrs)	N (%)
21-35	80(57.14%)
36-50	45(32.14%)
Above 50	15(10.71%)
Total	140(100%)

Table 3: Distribution of different injuries according to gender

Cases	Gender		Total
	Male	Female	
ACL tears	108	13	121
PCL tears	10	2	12
Medial meniscus tears	62	9	71
Lateral meniscus tears	20	6	26
LCL injuries	3	1	4
Joint effusion.	95	12	107

RESULTS

In the present study total patients were 140, among them 81.42% were males and 18.57% were females. So, in this study the distribution of knee injury was prevalent in males. The majority of the patients were young aged between 21-35 years (57.14%). Males continued to show increased incidence of ACL tears, PCL tears, MM tears, MCL tears and joint effusion in the study.

DISCUSSION

The role of magnetic resonance imaging has steadily increased and now it has become the first line investigation for most of the lesions of knee. It is also being used for pre and post-operative evaluation.[10]

In the present study total patients were 140, among them 81.42% were males and 18.57% were females. So, in this study the distribution of knee injury was prevalent in males. The majority of the patients were young aged between 21-35 years (57.14%). Males continued to show increased incidence of ACL tears, PCL tears, MM tears, MCL tears and joint effusion in the study.

Singh et al where authors noted 113 men (65.31%) and 60 women (34.69%) out of the 173 patients with history of knee injuries.[11]

Singh et al found that majority of the patients with knee injury were in third decade.[11]

Singh JP et al in their series of 173 patients, 78 patients (45.08%) showed ACL tears, among these 52 (66.67%), are partial, 16(20.51%) are complete and 10 (12.82%) cases showed non visualization of ACL. The authors concluded that ACL tears are more common than other ligamentous injuries with partial tears being commoner.[11]

Junkin DM. et al (2009) who stated that the anterior cruciate ligament is one of the most frequently injured ligaments of the knee.[12]

Sonin et al found the incidence of PCL tear to be 3 percent; in series of study analyzing 350 case of knee injury only 10 patients had PCL tear.[13]

In a study by Grover et al where they analyzed findings of 510 consecutive MRI of knee joints with an emphasis on PCL tear; 11 (2%) patients had different grades of tear on MRI which was confirmed correctly by arthroscopy. Of the other 202 patients who had undergone MRI as well as arthroscopy for internal derangement of knee none of the patients had any PCL injury as predicted correctly by MRI.[14]

The study done by Singh JP et al, in a series of 173 cases of MM was seen in 57(32.95%) patients, Grade 2 in 16(9.25%) patients & Grade 1 in 20(11.56%). In LM, Grade 3 tears were seen in 28(16.18%) patients, Grade 2 in 12 (6.94%) patients & Grade I in

14(8.1%) patients. which they found 57 (38.23%) patients showed MM tear and 28 (29.41%) patients showed LM tear.[11]

Hetta W., Niazi G. (2014) concluded that; MRI represents the optimal imaging tool in the evaluation of the sports related knee injuries, it is an accurate method of diagnosing meniscal, ligament, cartilage and muscles of injured knee.[15]

CONCLUSION

This study concluded that with the help of Magnetic resonance imaging knee injury found to be prevalent in males and in the age group 21-35 years. Incidence of ACL tears, PCL tears, MM tears, MCL tears and joint effusion were found to be more in males than females.

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