ORIGINAL RESEARCH ARTICLE

Correlation of Clinical examination, Magnetic Resonance Imaging (MRI) with Arthroscopic Findings in the Knee Joint

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A B S T R A C T

Introduction: Meniscal and ligament tears and osteoarthritic changes cannot be diagnosed completely by clinical examination; therefore, we have to use extra noninvasive or invasive measures to diagnose these changes, e.g. magnetic resonance imaging (MRI) and or arthroscopy. Currently, MRI is the noninvasive examination of choice in evaluation of internal derangement of the knee. Arthroscopy can be used for both diagnosis and treatment, but this technique is invasive and costly and is less efficacious for the evaluation of the extra capsular soft tissues. Study objectives were to find out the correlation of clinical examination, MRI, and arthroscopy in traumatic disorders of the knee joint.

Material and methods: A cross-sectional study was conducted in the Department of Radiology, NRI Medical College from August -2015 to August – 2017 with the sample size of 30 subjects.

Results: The accuracy of Clinical Examination and MRI in the present study was 81.7% (70% - 90%) and 83.3% (71% - 92%)

Conclusion:MRI showing accurate results than the clinical examination. In the present study, Sample size was 30, Large samples study needed for better results. General population may benefit if Healthcare systems of under developing countries should have special packages to cover the expenses of MRI and arthroscopies.

Key words: Clinical Examination, Magnetic Resonance Imaging (MRI), Arthroscopic, Knee Joint

INTRODUCTION

One of the most important and accurate diagnostic modalities is the clinical examination for evaluation of traumatic derangement of the knee joint. All patients with knee injury should be subjected routinely to a thorough clinical examination to make a provisional diagnosis. It is noninvasive, easy, available, and inexpensive but valuable diagnostic modality but the meniscal and ligament tears and osteoarthritic changes cannot be diagnosed completely by clinical examination; therefore, we have to use extra noninvasive or invasive measures to diagnose these changes, e.g. magnetic resonance imaging (MRI) and or arthroscopy. Currently, MRI is the noninvasive examination of choice in evaluation of internal derangement of the knee. Arthroscopy can be used for both diagnosis and treatment, but this technique is invasive and costly and is less efficacious for the evaluation of the extracapsular soft tissues.[1-5] In those patients with uncertain indications for arthroscopic surgery, MRI can be used as an effective screening study because the high negative predictive value (NPV) of MRI can spare many of these patients an unnecessary arthroscopic examination.[1,2,5-9] In patients with clearly defined indications for arthroscopy, routine use of preoperative MRI is more controversial.[10] Traditionally, arthrography and arthroscopy have been diagnostic gold standards for evaluation of internal derangements and other lesions of the knee. In recent years MRI has played an increasing role in the evaluation of knee lesions, its diagnostic potential is fallible. Study objectives were to find out the correlation of clinical examination, MRI, and arthroscopy in traumatic disorders of the knee joint.

Material and methods

A cross-sectional study was conducted in the Department of Radiology, NRI Medical College from August -2015 to August – 2017 on a total of 30 patients. Sampling was done with the help of purposive sampling.

Inclusion Criteria: Patients with presentation suggestive of traumatic knee pathology or symptomatic knees with complaints of pain, locking, giving way, or swelling were referred from the outpatient/Emergency Department of Orthopedics. A detailed history was taken and relevant clinical examination was done followed by MRI of the knee, whenever possible. The imaging consisted of multiple surveys in all planes and was reported. The patients were examined and prepared for arthroscopy under general or spinal anesthesia, which were reported.

Exclusion Criteria: Patients who are not willing to

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participate

Data Management: Data Dictionary was prepared in MS Word and Data was entered in MS Excel.

STATISTICAL ANALYSIS

Data was analyzed by using SPSS V22. Descriptive statistics were represented with percentages. Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value and Overall Accuracy were calculated. 95% confidence levels were calculated.

RESULTS

In the present study, from table-1, 63.3% of the study subjects were male and 36.7% were female. 40% of the study subjects were aged between 30-40 years, 36.7% were aged between 40-50, 23.3% were aged between 50-60.

From table-2, Majority of the subjects 83% felt pain, 77% of the subjects had more than one complication. Table 3 shows the clinical, magnetic resonance imaging, and arthroscopic examination among sample population. Table 4 shows the clinical examination and magnetic resonance imaging findings of the knee joint in comparison to arthroscopic findings.

Gender	Count	%
Male	19	63.3
Female	11	36.7
Age	Count	%
30 - 40	12	40.0
40 - 50	11	36.7
50 - 60	7	23.3

Table-1: Distribution of Study subjects according to their Gender and Age

Complications	Count	%
Pain	25	83
History of locking	8	24
History of giving way	14	47
Click	16	53
More than one complaint	23	77

Table-2: Distribution of study subjects according to their complications

Diagnosis	Normal Findings	Medial Meniscal Injury	Lateral Meniscal Injury	ACL Injury	PCL Injury
Clinical examination	0	16	2	16	0
MRI	0	22	7	19	0
Arthroscopy	5	15	5	18	0

ACL - Anterior Cruciate Ligament; MRI - Magnetic Resonance Imaging; PCL - Posterior Cruciate Ligament

Table-3: Clinical, Magnetic Resonance Imaging, and Arthroscopic Examination

Statistics	MRI	Clinical Examination
Sensitivity	80.0% (61% - 92%)	73.3% (54% - 88%)
Specificity	86.7% (69% - 96%)	90.0% (73% - 98%)
Positive Predictive Value	85.7% (70% - 94%)	88.0% (71% - 95.6%)
Negative Predictive Value	81.3% (68% - 90%)	77.1% (65% - 86.0%)
Accuracy	83.3% (71% - 92%)	81.7% (70% - 90%)

Table-4: Clinical Examination and Magnetic Resonance Imaging Findings of the Knee Joint in Comparison to Arthroscopic Findings

DISCUSSION

In the present study, arthroscopy was used as gold standard method to determine the diagnostic accuracy of methods that investigate internal knee derangements. Arthroscopy was not 100% accurate and operator dependent.[2,7-9,11,12,14,16] At present, arthroscopy was the diagnostic test with which all others to be compared for determine the diagnostic effectiveness.[15] The accuracy of MRI in the present study was 83.3.7% (71% - 92%), which was very lower in comparison to other studies.[1,7-19] The NPV of MRI in this study was 81.3%, and lower than rates in other studies.[1,7-9,11-18,20] Even though MRI is the noninvasive examination of choice, the routine use of preoperative MRI[10] was not recommended. It can be used as an effective screening study in those with uncertain indications for arthroscopic surgery.[1,2,5-9] The stress is always on the clinical examination because of the varying arthroscopic and MRI findings. The clinical examination should be the gold standard for selecting patients for arthroscopy Where the MRI or arthroscopy is not readily available. The general population may benefit if healthcare systems of under developing countries must need special packages to cover the expenses of MRI and arthroscopies.

Limitations

Sample size was 30 in the present study, large samples study needed for better results.

CONCLUSION

MRI showing accurate results than the clinical examination. In the present study, Sample size was 30, Large samples study needed for better results. General population may benefit if Healthcare systems of under developing countries should have special packages to cover the expenses of MRI and arthroscopies.

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