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A PROSPECTIVE STUDY OF COMPARISON OF THESSALY TEST WITH JOINT LINE TENDERNESS AND MCMURRAY TEST IN THE DIAGNOSIS OF MENISCAL TEARS

Orthopaedic

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ABSTRACT

INTRODUCTION: Meniscus injuries are the most frequent problem of the knee. The aim of this study was to investigate the sensitivity, specificity and accuracy of Thessaly, McMurray and joint line tenderness in meniscus tear and compare them with each other.
MATERIALS AND METHODS: This study was done in GMC JAMMU in department of orthopaedics. 120 patients symptoms of meniscus tears were included. The study period was from January 2019 to February 2020. Three tests were carried out on patients and results recorded.The results were compared with MRI findings. The sensitivity, specificity and accuracy were calculated as main outcomes. Results: Based on MRI, Thessaly was the most sensitive for medial meniscus tears (57.2%), while McMurray and joint line tenderness were more specific (88.1% and 89.2%, respectively). In cases of lateral meniscus tears, McMurray sensitivity was highest (55.8%) and all three were specific (McMurray 89.8%, Thessaly 89%, joint-line tenderness 91.2%). The accuracy of tests for medial meniscus were 68.2 % Thessaly, 65.8 % McMurray and 66.2 % for joint line tenderness. The accuracy for lateral meniscus were 80.4 % Thessaly, 84 % McMurray and 83.6% for joint line tenderness.
CONCLUSION: The Thessaly can be used to screening test for medial meniscus tears. McMurray and joint-line tenderness should be used to confirm our findings. For lateral meniscus, McMurray can be used as screening test and all three can be use to confirm our findings.

KEYWORDS

INTRODUCTION

Knee pain is one of the common problem for which medical consultation is done 1, out of which 9% are associated with meniscal lesions2. With help of subjective symptoms of patients predictive value of recognising meniscal lesion approaches 70-80%, but exact diagnosis can't be made from history alone3. A number of tests can be used for diagnosing the meniscus tears: the McMurray's, the Apley compression and distraction, and the joint line tenderness test 4-14. When weight bearing compression is applied to tests, it increases there predictive values15,16. 61% prediction value is calculated with medial joint line tenderness, knee locking, daily pain and work absence for meniscal tears 3.More recently, the Thessaly test was suggested to be safely used as a first line screening test for identifying the candidates of arthroscopic meniscal surgery. The test also was reported to have a lower false positive and false negative compared to other clinical tests16. On the other hand, MRI is considered as the diagnostic method of choice because of providing a reliable non-invasive tool in identifying common knee pathology4,17. Arthroscopy is the gold standard for the diagnosis of meniscal lesions, with 90-95% accuracy18.

Low specificity, sensitivity, and diagnostic accuracy of the clinical tests may leave meniscal lesions undetected. The methodological quality of the studies on the clinical tests has a significant effect on reported sensitivities and specificities as well2,19. High cost and false positives are the disadvantages of MRI for the diagnosis of meniscal lesions4,20. A false positive of 65% for identifying medial meniscal tears and 43% for lateral meniscus tears have been estimated for MRI when compared with surgical findings21. Even, some researchers believe that MRI is not superior to physical examination in the diagnosis of meniscal tears20. Invasiveness and high cost are the major drawbacks for common use of arthroscopy too4. Therefore, we need less expensive, non-invasive, and more accurate methods of identifying meniscal lesions. The optimal clinical tests and measures should be selected with high sensitivity and specificity.

MATERIAL AND METHOD

Our study is a prospective study conducted in GMC Jammu from January 2019 to January 2020 in Department of orthopaedics. Consecutive patients aged more than 18 years who had a current knee pain or discomfort, history of swelling or effusion, knee locking, or clicking sensation on movement of the knee were enrolled in the study. Exclusion criteria included individuals with a previous history of knee surgery or arthroscopy, and the radiologic evidence or clinical manifestations of osteoarthritis and rheumatologic diseases. In addition, we excluded patients if they could not attend the clinical examinations and did not take MRI. Patients were interviewed to obtain their past medical histories. The presence of the symptoms and signs of meniscal lesions and other knee problems were questioned. In addition, the recruitment questionnaire asked about consultation with a physician and active or previous treatment and surgery. Then we performed physical examinations and conducted further investigations for the diagnosis of meniscal lesions. We recorded any pain or discomfort, clicking sensation or locking on movement, and swelling and injury of the knee. For the Thessaly test, participants were instructed to stand while supported by holding their hands. Thereafter, they were guided to perform internal and external rotation of the knee and body in three occasions during which the knee was flexed at almost 20°. We considered the test as positive when the patients had medial or lateral joint-line discomfort or experienced locking in the knee4. For all the participants, we performed McMurray and joint line tenderness at the lateral and medial sides. Further investigations including MRI were ordered and lesions were graded22.MRI was taken as gold standard. Senstivity, specificity and accuracy values of 3 tests were calculated.

RESULTS

A total of 120 patients were included in the study. The mean age of the patients in was found to be 24.8 +_ 5.2 (range 18-50) years, and sex distribution was 75 males (62.5%) and 45 females (37.5%). We performed MRI for all patients. Overall, 88 (73%) participants had medial meniscus tears including 28 (23.3%) grade I, 33 (27.5%) grade II, 24 (20%) grade III, and 3 (2.5%) grade IV. Also, 14 (11.6%) patients had lateral meniscus tears including 6 (5%) grade I, 4 (3.3%) grade II, 3 (2,5%) grade III and 1 (0.8%) grade IV lateral meniscus tear among the participants. Other findings on MRI included 48 (40%) incomplete and 16 (13.3%) complete anterior cruciate ligament tear, 2 (1.6%) incomplete posterior cruciate, 15 (12.5%) incomplete medial collateral ligament tear, 6 (5%) incomplete lateral collateral ligament tear. Based on MRI, Thessaly was the most sensitive for medial meniscus tears (57.2%), while McMurray and joint line tenderness were more specific (88.1% and 89.2%, respectively). For lateral meniscus tears, McMurray was the most sensitive (55.8%) and all were specific (McMurray 89.8%, Thessaly 89%, joint-line tenderness 91.2%). The accuracy of tests for medial meniscus were 68.2 % Thessaly, 65.8 % McMurray and 66.2 % for joint line tenderness. The accuracy for lateral meniscus were 80.4 % Thessaly, 84 % McMurray and 83.6% for joint line tenderness.'

DISCUSSION

Meniscal tears are the result of injury or degeneration of the substance of the meniscus. Majority patients with meniscal tears complain of an acute onset of sharp pain following a twisting injury with the knee flexed and the foot planted on the ground23. The diagnosis of meniscus tear can frequently be made from a careful history, physical examination and appropriate diagnostic tests. There are various provocative manoeuvres or tests to elicit symptoms from a torn meniscus, but the reported accuracy has been inconsistent across

studies. In this study, we tried to compare the accuracy of Thessaly test with those of McMurray and joint line tenderness in screening for meniscal tears. We compared the results of the clinical tests with findings of MRI. Our results demonstrated that when MRI is the basis for the diagnosis of medial meniscus tears, Thessaly is the most sensitive, while McMurray and joint-line tenderness are more specific clinical tests. In other words, a negative Thessaly test is more helpful in ruling out medial meniscus tears and a positive McMurray or joint-line tenderness test can be used for ruling in the tears. For lateral meniscus tears McMurray is the most sensitive and all the three tests are highly specific. The accuracy of Thessaly was highest for medial meniscus and MacMurray have highest accuracy for lateral meniscus tear.

In a study by Gupta et al 24 with 66 knees to validate joint line tenderness, the sensitivity, specificity, positive predictive value, negative predictive value and accuracy in diagnosing medial meniscus tears found to be 50%, 61.7%, 51.8%, 60% and 56.4%, respectively. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy for McMurray's test for diagnosing medial meniscus tear were 54%, 79%, 68%, 67.50% and 67.74%, respectively. The author concluded that clinical tests like McMurray and joint line tenderness have low diagnostic value when applied individually. They may be useful when combined together with the background of clinical history. The diagnostic parameters of McMurray test were in concordance with our results, while those were lower than our study regarding joint line tenderness. In a study by Karachalios et al 16, 213 patients with knee injuries underwent MRI and arthroscopic surgery, and 197 asymptomatic participants underwent MRI on their normal knees. It was reported that the Thessaly test at 20° of knee flexion had a diagnostic accuracy of 94% for the detection of medial meniscus tears and 96% for the lateral meniscus tears, and that the test had a low rate of false-positive and false-negative recordings. They suggested that other clinical tests showed inferior accuracies, except for joint line tenderness with the accuracy of 89% in the detection of lateral meniscal tears. It was concluded that the Thessaly test at 20° of knee flexion can be used effectively as a first-line clinical screening test. They even claimed that the test will reduce the need for and the cost of modern MRI methods. Our results failed to show the superiority of the Thessaly test. In another study on 109 (80 males) patients with average age of 39 (16 to 56) years, the diagnostic accuracy of the Thessaly test was compared with joint line tenderness and McMurray's tests. Patients were presented with a history suggestive of a meniscal tear. They underwent MRI and arthroscopy. The study showed a relatively low diagnostic accuracy for the Thessaly (61% for medial meniscus and 80% for lateral meniscus), and the McMurray's tests (57% for medial meniscus and 77% for lateral meniscus). It was declared that the joint line tenderness test is the most accurate (81% for medial meniscus and 90% for lateral meniscus). Also, it was suggested that combining the tests further increased the accuracy. It was concluded that the Thessaly test in isolation was not useful for the detection of meniscal tears but it helps to increase diagnostic certainty when combined with other tests4. With regard to the Thessaly test and when MRI was considered as the standard diagnostic method, the results of that study were comparable to ours.

CONCLUSION

Our study showed that the Thessaly is a sensitive clinical test for the diagnosis of medial meniscus tears. Therefore, the test can be used to screen general population. On the other hand, McMurray and joint-line tenderness are more specific and should be used to diagnose medial meniscus tears in patients with the related clinical manifestations. For lateral meniscus tears, the McMurray test is appropriate for screening and all the three tests are useful in the physical examination of patients with the suspected tears. Overall, we did not find important difference in the diagnostic usefulness of the three tests and prefer to use the tests combined

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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