

**IJCRR**

Vol 06 issue 11

Section: Healthcare

Category: Research

Received on: 19/03/14

Revised on: 15/04/14

Accepted on: 17/05/14

## TO STUDY THE EFFECTIVENESS OF THERAPEUTIC INSOLES IN PATIENTS WITH OSTEOARTHRITIS

Rhucha Jadhav<sup>1</sup>, James Ghagare<sup>1</sup>, Rachana Dabadghav<sup>1</sup>, Savita Rairikar<sup>1</sup>, Ashok Shyam<sup>2</sup>, Parag Sancheti<sup>2</sup>

<sup>1</sup>Sancheti Institute College of Physiotherapy, Thube Park, Shivajinagar, Pune, MS, India

<sup>2</sup>Sancheti Institute College of Orthopedic Rehabilitation, Thube Park, Shivajinagar, Pune, MS, India

E-mail of Corresponding Author: doc.ashokshyam@gmail.com

### ABSTRACT

**Objective:** To find out if there are any significant pain relief, change in stiffness and change with respect to difficulty in performing activities of daily living.

**Methods:** Thirty patients suffering from osteoarthritis were taken and they were evaluated on the basis of Western Ontario and McMaster Universities Arthritis Index (WOMAC) scale. The patients who had a verbal analog scale (VAS) more than 15 were put in an experimental group and the remaining 15 were put in the control group. A removable therapeutic insole was given to the experimental group for a period of 3 weeks. They were then reevaluated based on the WOMC scale.

**Results:** Therapeutic insoles show to have no significant effect on the pain, stiffness or on the activities of daily living  $p \geq 0.05$ .

**Conclusion:** There was no significant difference seen in components of pain, stiffness, difficulty in Activities of daily living (ADLs) in patients of controlled and experimental group which derives that the conventional therapy for osteoarthritis is beneficial alone and the conventional therapy used along with modification of insole makes no significant changes in pain component of the patient.

**Keywords:** Osteoarthritis, WOMAC, physiotherapy, insole.

### INTRODUCTION

Osteoarthritis is the most common type of Arthritis and generally develops in people who are above 50 years of age. It tends to be more common in women than in men. It affects most commonly the knees, hips and small joints of hands. The biomechanical stresses that affect the articular cartilage and subchondral bone<sup>1,3</sup>

Typically, the joints affected by Osteoarthritis show the features mainly damage to cartilage (cartilage lines the bones and reduces friction, allowing the joints to move smoothly and easily). Bony growths developing around the edge of the joints after cartilage loss the bone starts wearing down and the body creates new bone to keep up with the wear they are termed as Osteophytes. Mild

inflammation of tissues around the affected joints termed as synovitis.<sup>1,2,4</sup>

Insoles help attain a correct posture, through proprioception, so the muscles keep the feet and body balanced. They help in maximum shock absorption, are efficient in off-loading. Most of the insoles are scientifically designed to match foot contours which help in maximum reduction of shear stress.<sup>8,9,10</sup>

The Insoles that our study provides to the patient is made up of synthetic sheets and Evasheets. They are designed to provide shock absorption and high resistance to compressive deformation.<sup>10</sup>

The main purpose of our study is mainly to focus on pain reduction through footwear modification as most of the studies focus on dealing with

osteoarthritis with the help of diet modification, regular exercise, use of assistive devices like canes / stick but there is very few research done on footwear modification on patients with osteoarthritis which would help them lead a pain free lifestyle.

## MATERIALS AND METHODS

The study was done on 30 subjects. The study was approved by the ethics committee of the institution and a written informed consent was taken from all the subjects. The subjects were selected according to inclusion and exclusion criteria and were divided into controlled and experimental group. Inclusion criteria was patients with osteoarthritis who are mobile, independent and able to do activities of daily living, who use footwear like sandals or sports shoes during their activities of daily living and those diagnosed as Osteoarthritis by surgeons and physicians. Exclusion Criteria were patients with previous ankle surgeries or LL fractures or total knee replacement surgery, with existing limb length discrepancy, with any neurological deficit, using

existing footwear modifications like orthosis. Both the groups were asked to continue with their diet modification and regular exercise. The sampling was done on the basis on Pain evaluation and verbal analogue scale was noted, those whose pain was more than 5/10 were selected for experimental study. An evaluation was done prior to modification of insole which was mainly done using WOMAC scale. Follow up was done at the end of intervention period (3 weeks) and they were again evaluated on using WOMAC scale.

## RESULTS

The result was analysed using SPSS software version 12. The between group analysis was done using Mann Whitney test and within group analysis was done using Wilcoxon sign rank test. Table 1 shows significant difference  $p < 0.05$  between pre and post results of experimental group i.e. the WOMAC score significantly improved after using therapeutic insoles. But there was no significant difference between experimental and control group as stated in table 2 as  $p > 0.05$

**Table 1: WOMAC score pre and post – experimental group**

	Pre	post	P-value
<b>WOMAC SCORE</b>	45.93	42.06	0.001*

**Table 2: WOMAC score control vs experimental**

	Controlled	Experimental	P-value
<b>WOMAC SCORE</b>	42.6	42.06	0.317

## DISCUSSION

The purpose of our study was to find out if there were any significant changes in pain, stiffness and of daily living in patients with osteoarthritis. Osteoarthritic patients normally show changes in gait pattern due to various changes like increase in knee adduction, weakness of quadriceps muscles and antalgic gait due to reduction of medial joint space which causes friction and pain during walking, stair climbing or similar activities. The concept of introducing an

therapeutic insole in the patients footwear was to ensure uniformity of weight distribution, reducing direct stress on the knee joint and help in maximum shock absorption which in turn reduces the wear and tear of the joint.<sup>8,9</sup> It was found that there was significant reduction in pain during activities of daily living which was done in pre and post intervention period using WOMAC scale. It was mainly due to properties of insoles which is made of synthetic materials mainly Evasheets which add to the cushioning effect and help in

maintaining the foot contours and get moulded according to the footwear shape. This type of insole mainly is efficient as it doesn't wear with time or over use as in contrast to use of silicon which wears out with time and hence prove less efficient in serving the purpose. Also the patients were following conventional treatment of exercise and there was uniformity in the exercise they performed so the reduction in pain in pre and post WOMAC can also be due to the exercise regime followed by the patient through the duration of 3 weeks. There was no significant changes in controlled group against experimental group of patients which was mainly due to the controlled group undergoing conventional treatment of osteoarthritis which helped in strengthening of muscles as against the patients who used insole and followed the conventional treatment of osteoarthritis along with modification in which the insole might have just added slight complementary benefit in addition to the benefits provided by exercise.

## CONCLUSION

The conclusion of our study shows that the therapeutic insoles show significant changes in components like pain reduction and components of difficulty in ADLS in experimental group who were taking conventional exercises for osteoarthritis along with insole modification.

The study shows that the insole doesn't have any significant changes on stiffness which is a rough guide to inflammatory process in the joints and it cannot be corrected with use of any external modification like insole.

There was significant difference in the Pre WOMAC scale and Post WOMAC scale of the patients with osteoarthritis which shows the effectiveness of insole in patients which is due to the conventional treatment taken by the patients

There was no significant difference seen in components of pain, stiffness, difficulty in ADLS in patients of controlled and experimental group which derives that the conventional therapy for

osteoarthritis is beneficial alone and the conventional therapy used along with modification of insole makes no significant changes in pain component of the patient.

## ACKNOWLEDGEMENT

Authors acknowledge the immense help received from the scholars whose articles were cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed. We would also like to thank all our participants and for their valuable time and participation.

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