Effectiveness of physical therapy interventions for Gout Arthritis – Single case study report

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ABSTRACT

Gout is a form of arthritis that causes joint pain. Gout is a painful and potentially disabling form of arthritis. The first symptoms usually are intense episode of painful swelling in single joints, most often in the first metatarsal joint. The swollen site may be red and warm. The objective of this study to evaluate the effectiveness of Physical therapy intervention in 30 years old men with a two year of gouty arthritis. Clinical investigation shows elevated uric acid level in the blood.

Radiological findings show trophy changes in the first metatarsal joints. The study involved pre assessment phase, 2 weeks of treatment phase and 2 weeks of home exercise phase. Pain assessed using the visual analogue scale (VAS). Functional disability of the foot was measured by the foot function index (FFI). Physical therapy interventions are followed such as heat therapy, mobilization, and Theraband strength training. Following treatment visual analysis revealed beneficial effects on pain and functional disability. Their improvement was maintained over the home exercise phase and at the 1 month follow up.

Gout is a form of inflammatory arthritis associated with pain and impaired quality of life. This single case report study would suggest that physiotherapy management could be an effective treatment for gout arthritis in various stages. Significant changes have been found in the clinical manifestations after application of various physical therapy interventions in this participant. Improving quality of life in the gout arthritis subjects is a challenging part while management advised conservatively, as well the importances of physiotherapy should be major concerned in the future.

Key words: Foot Function Index, Heat therapy, Thera band, Visual Analogue Scale

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INTRODUCTION

Gout is a common disease with a worldwide distribution. The major risk factor for the development of gout is sustained asymptomatic hyperuricaemia. Although pharmacological therapy of asymptomatic hyperuricaemia is not recommended, primary prevention of gout can be achieved through lifestyle changes including weight loss, restricting protein and calorie intake, limiting alcohol consumption, avoiding the use of diuretics in the treatment of hypertension, and avoiding occupational exposure to lead.[1]

There are three stages in the management of gout: (i) treating the acute attack; (ii) lowering excess stores of uric acid to prevent flares of gouty arthritis and to prevent tissue deposition of urate; and (iii) providing prophylaxis to prevent acute flares. It is important to distinguish between therapy to reduce acute inflammation in acute gout and therapy to manage hyperuricaemia in patients with chronic gouty arthritis. During the acute gouty attack nonpharmacological treatments such as topical ice and rest of the inflamed joint are useful. NSAIDs are the preferred treatment of acute gout.

The most important determinant of therapeutic success is not which NSAID is chosen, but rather how soon NSAID therapy is initiated. [2] Arthritis caused by gout (i.e., gouty arthritis) accounts for millions of outpatient visits annually, and the prevalence is increasing. Gout is caused by monosodium urate crystal deposition in tissues, leading to arthritis, soft tissue masses (i.e., tophi), nephrolithiasis, and urate nephropathy. The biologic precursor to gout is elevated serum uric acid levels (i.e., hyperuricemia). Asymptomatic hyperuricemia is common and usually does not progress to clinical gout.

Acute gout most often presents as attacks of pain, erythema, and swelling of one or a few joints in the lower extremities. The diagnosis is confirmed if monosodium urate crystals are present in synovial fluid. First-line therapy for acute gout is a nonsteroidal anti-inflammatory drugs or corticosteroids, depending on commodities; colchicine is second-line therapy.[3] The management of gout can be subdivided into four phases. Asymptomatic hyperuricaemia represents the basic underlying metabolic abnormality that can lead to gout. Studies are evaluating whether interventions may be indicated in some cases.

Diagnostic criteria for gout and acute flares are still not well defined unless urate crystals are found. Acute attacks of gout are treated with anti-inflammatory measures and the agent of choice is often determined by attack stage, severity and comorbidities that may contra-indicate one or more agents. [4]

Gout usually flares up during an acute illness, and should be considered while evaluating acute mono articular arthritis. Rarely, it can also present with tophi as an initial manifestation. [5] In contrast, best of our knowledge, there is no validation there are no published validation studies assessing the accuracy of gout-related physical therapy intervention. The objective of this single case studies report to examine the efficacy of physical therapy intervention to the gouty arthritis. Repeated episode attack of gouty arthritis effectively treated by physical therapy interventions such as heat modalities, soft tissue manipulation and physical therapy exercise.

CASE REPORT

A 30 year old male, 15 months before had history of severe pain, swelling and stiffness of first metatarsal joint of the great toe on the right side. Pain was started suddenly restricting his motion in the great toe on the right side. He was advised to get physician opinion. He was treated with analgesics and NSAIDS initially. After had conservative management (medications) pain decreased. Later he was starting to do his functional activities normally without any restriction. Six months later when he had protein rich food with alcohol intake he was starting to feel same clinical symptoms suddenly. This time he felt swollen on the lateral aspect of first metatarsal joint, severe stiffness of the great toe on the right side and restriction in functional activities. At this time the subject was examined by orthopedician at a multi specialty hospital in Bangalore.

When he was treated with NSAIDS intensity of pain was on the same level. Orthopedician are directed him to go for pathological investigation and further clinical evaluation. A pathology report shows elevated levels of Uric Acid in the blood and deficiency of Vitamin D. Study design – single case study design. A study was conducted in the outpatient department at the Oxford college of Physiotherapy, Hongasandra, Bommanahalli, Bangalore. A study was carried out two weeks.

Intensive physiotherapy followed by two weeks to reduce the stiffness level in the great toe and pain in the first metatarsal

joint. Before the treatment complete physiotherapy evaluation done and recorded on the OPD assessment sheet. Intensity of pain was recorded by the use of visual analogue scale. A functional activity of foot was recorded by the use foot function index.

Treatment procedures

Pain management was done by the use of superficial heat modalities. Wax was applied directly on the affected site by the use of the paint brush method(8 layers). Before wax therapy application, subject sensory examination was done examined carefully with patient consent. After application of wax therapy application treatment part was covered with plastic paper 10 to 15 minutes. Wax therapy was applied regularly for two weeks excluded on Sunday. The subject was advised to give hot water immersion technique 15 to 20 minutes for his affected foot to manage his intensity of pain and stiffness in the first metatarsal joint at the night time.

Hot water immersion has been advised twice a day each session approximately 15 minutes to reduce stiffness and swelling. Exercises were suggested to reduce the first metatarsal joint stiffness and increase range of motions. Planned physiotherapy exercises and managed has been suggested for two weeks with regular reviews in our oxford college of physiotherapy out patient department.

During the first set of treatment session pain intensity was measured by the use of Visual Analogue (VAS) and foot functions were measured by use of the Foot Function Index(FFI). Intensity of pain was recorded three days once, the Foot Function Index was assessed weekly once. The pre test score was measured by the use of VAS and FFI. Data were assessed by statistical analysis. Pain level assessed by the use of visual analogue scale and foot functions was measured by the use of FFI. Pre and post treatment data were collected regularly. Visual analogue scale was explained to the patient before analysis the quality of pain to avoid communication errors. The pre test value of VAS shows quantity of pain was 9. The post test value of VAS was measured 0. FFI scale data were assessed before the evaluation of FFI, various components of FFI was explained clearly to the participant. The pre test value of FFI showed 70%. Post test value of FFI showed 34%. The clinical significance of physiotherapy management is well documented by the use of pain measurement(VAS)and quality of life(FFI).

Anteroposterior presentation

Photographic presentation of lateral view shows trophus

Photography presentation of lateral view shows swelling at first metarasal joint

Photography presentation of dorsal view shows lateral deviation of great toe

DISCUSSION

Gout is a most common form of inflammatory arthritis and the findings of several studies suggest that the prevalence and incidence of gout has risen in recent decades. Gout usually flares up during an acute illness, and should be considered while evaluating acute mono articular arthritis. Rarely, it can also present with tophi as an initial manifestation.[6] A Foot Function Index (FFI) was developed to measure the impact of foot pathology on function in terms of pain, disability and activity restriction.[7] May not be appropriate for individuals who function at or above the level of independent activities of daily living.[8]

The FFI should prove useful for both clinical and research purposes. It has been shown to be a reasonable tool for use with low functioning individuals with foot disorders and patients with rheumatoid arthritis and non-traumatic foot or ankle problems.[9] FFI is an instrument that was rated positively for responsiveness. [10] In 1991, the Foot Function Index (FFI) was developed as a self-reporting measure that assesses multiple dimensions of foot function on the basis of patient-centered values. In the past 20 years, the FFI has been widely used by clinicians and investigators to measure pain and disability in various foot and ankle disorders and its use has expanded to involve children, adults, and older individuals.[11]

Pre and post foot functions was measured by the use of the foot function index. Foot functions are measured prior to the treatment sessions. Self reporting measures of FFI filled by participants with the help of a physiotherapist. It shows marked changes in the Foot Functions and pain. A 30 years old male had sudden onset of severe pain, swelling and stiffness of his right First metatarsal joint. Clinical investigation shows his elevated uric acid level in the blood. The first episode was treated successfully with medicines. When he had a second episode after 3 months, the intensity of pain was severed and stiffness moderate. During this time, clinical manifestation managed with medication and diet modifications. Third attack had a history of excessive intake of purine food and alcohol. This attack was taking place one month back. This time medication helps to reduce intensity pain also quantity of pain is same.

One week he was treated with medicine such as NSAIDS and Analgesics. Later physician advised him to go for physical therapy treatment. He was treated at the outpatient Physiotherapy Department, The Oxford college of Physiotherapy, Bommanahalli, Bangalore. Later on, two weeks of physical therapy treatment, patient pain level, swelling and stiffness, reduced significantly and functional activities shows marked improvement. Recent epidemiological studies have described trends in the prevalence and incidence of gout, and have increased our understanding of risk factors for its development and the implications of co-morbid disease on mortality and cardiovascular morbidity.[12]

Gout is a form of inflammatory arthritis associated with pain and impaired quality of life. This single case report study would suggest that physiotherapy management could be an effective treatment for gout arthritis in various stages. The first MTP joint is the first joint attacked in roughly 50% of individuals. Some persons never have clinical attacks of gout, but rather they slowly build tophaceous deposits in and around joints. [13] Significant pain, activity limitation, and disability in patients with acute and chronic gouty arthritis, lower health-related quality of life. Although many effective therapies are available for gouty arthritis, medication errors are common.

One goal of therapy is to reduce the frequency of gout flares by lowering serum uric acid. [14] A concerted effort is needed to improve the quality of care and quality of life in patients with gout. This approach may include physician education, patient education and other interventions that can help to prevent errors in use of gout medications. [15]

CONCLUSION

Gout is a form of inflammatory arthritis associated with pain and impaired quality of life. This single case report study would suggest that physiotherapy management could be an effective treatment for gout arthritis in various stages. Significant changes have been found in the clinical manifestations after application of various physical therapy interventions in this participant. Improving quality of life in the gout arthritis subjects is a challenging part while management advised conservatively, as well the importances of physiotherapy should be major concerned in the future.

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REFERENCES

1. Star VL1, Hochberg MC, Prevention and management of gout, Drugs. 1993 Feb;45(2):212-22.

2. Schlesinger N, Management of acute and chronic gouty arthritis: present state-of-the-art, Drugs. 2004;64(21):2399-416.

3. Eggebeen AT, Gout: an update, Am Fam Physician. 2007 Sep 15;76(6):801-8.

4. Chen LX1, Schumacher HR, Gout: can we create an evidence-based systematic approach to diagnosis and management?, Best Pract Res Clin Rheumatol. 2006 Aug;20(4):673-84.

5. Abhijeet Dhoble*, Vijay Balakrishnan and Robert Smith, Chronic tophaceous gout presenting as acute arthritis during an acute illness: a case report, Cases Journal 2008, 1:238 doi:10.1186/1757-1626-1-238

6. Abhijeet Dhoble*, Vijay Balakrishnan and Robert Smith, Chronic tophaceous gout presenting as acute arthritis during an acute illness: a case report. Cases Journal 2008, 1:238 doi:10.1186/1757-1626-1-238

7. Budiman-Mak E, Conrad KJ, Roach KE. The Foot Function Index: a measure of foot pain and disability. J Clin Epidemiol. 1991;44:561–570.

8. Agel J, Beskin JL, Brage M, Guyton GP, Kadel NJ, Saltzman CL, Sands AK, Sangeorzan BJ, SooHoo NF, Stroud CC, Thordarson DB: Reliability of the foot function index: a report of the AOFAS outcomes committee. Foot Ankle Int 2005, 26:962-967.

9. Martin RL, Irrgang JJ. A survey of self reported outcome instruments for the foot and 9nkle. J Orthop Sports Phys Ther.2007;37:72–84.

10. Marike Van Der Leeden, Martijn P.M. Steultjens, Caroline B. Terwee, Dieter Rosenbaum, Debbie Turner, Jim Woodburn and Joost Dekkera. Systematic review of instruments measuring foot function, foot pain, and foot-related disability in patients with rheumatoid arthritis. Vol. 59, No. 9, September 15, 2008, pp 1257–1269.

11. Budiman-Mak, E. et al., 2013. A review of the foot function index and the foot function index - revised. Journal of foot and ankle research, 6(1), p.5.

12. Edward roddy, Michael Doherty, epidemiology of gout, Arthritis & Therapy, 2010, 12:223,

13. Natalie Dubchak, Gerald F Falasca, New and improved strategies for the treatment of gout, International Journal of Nephrology and Renovascular Disease, 22 November, 2010:3 145–166,

14. Singh JA, Quality of life and quality of care for patients with gout, Current Rheumatology, Rep. 2009 Apr;11(2):154-60.

15. Jasvinder A. Singh, Quality of Life and Quality of Care for patients with Gout, Curr Rheumatol Rep. Apr 2009; 11(2): 154–160.

Flow chart about Treatment Procedures