



A CASE STUDY ON- A PHYSIOTHERAPY INTERVENTION PROTOCOL FOR RHEUMATOID ARTHRITIS

Sristhi Diwedi¹, Dr.Nidhi Agarwal²
Intern student¹, Assistant Professor²
RAMA UNIVERSITY, KANPUR^{1,2}

ABSTRACT

Background- Rheumatoid arthritis (RA) is a painful, chronic disorder that shortens life expectancy and causes gradual joint degeneration, disability, and other problems. Even a small amount of inflammation has the potential to cause lasting impairment. Patients with RA may experience an intermittent or progressive clinical course depending on their symptoms. In the majority of patients, structural damage begins to appear within the first two years of the clinical course. In order to relieve pain and stop joint deterioration and functional loss, RA therapy must be successful. The treatment and prevention of RA is improved, and people with RA experience fewer challenges with daily living because of the applications of physiotherapy and rehabilitation, which greatly strengthen medicinal therapy.

Case Description- A 46 year old women had RA from 7 years . she had difficulty to perform ADLs like holding and grasping objects. Rheumatologists confirms the diagnosis of RA . she was having pain and stiffness in the hands

Interventions- Total 25 days of physiotherapy sessions was given to the patients in which we had given wax bath therapy and UST to decrease the pain and stiffness. Active ROM exercises with smile ball and resisted exercise with the help of rubber band helps to gain the hand grip strength.

Outcomes-The following 25 days treatment physiotherapy program there was marked improvement in ROM and decrease the pain and stiffness in the hands .patient was able to perform house hold chores .we advice to perform the home exercise program independently for the better outcomes.

Conclusion- This case study is consistent with current research that shows the benefits of active range of motion exercises with smile balls, resisted finger workouts with rubberbands, and the usage of hand grippers to strengthen hand muscles. Additionally, paraffin wax bath treatment and ust are efficient combo therapies for RA patients.

Keywords- Rhematoid arthritis , ROM exercise , physiotherapy

INTRODUCTION

RA is a chronic, symmetrical, inflammatory autoimmune disease .It affects the small joints(peripheral joints such as finger and wrist) and also affect the skin, eyes, heart, kidneys, and lungs. Joint bone and cartilage are frequently damaged, and tendons and ligaments become weak and make the patient frail. *joints get inflamed and bonny erosion start which causes degenerative changes around the joint* (1).Result is joint deformity occurred like Swan neck deformity, boutonniere deformity ,Triggered finger and thumb deformity occurs in hand, and flexion and valgus deformity of the knee can be formed in this condition. Rheumatoid nodules under the skin, fatigue, fever, weight loss, and early stiffness of the affected joints lasting longer than 30 minutes are all common signs of RA. Generally the illness begins between the ages of 35 and 60, with periods of remission and worsening(2)

The hand is made up of a variety of intricate structures that allow for a wide range of movements, many of which are necessary for everyday tasks. The joints in the hand are synovial joints, like many other joints in the body. The synovium, a thin, malleable membrane that surrounds these joints, gives them mobility. Synovial fluid, a thin, transparent, viscous fluid produced by the synovium, generally lubricates and nourishes the joint to allow movement. However, in persons with rheumatoid arthritis, the immune system can misbehave and target healthy tissue in the fingers and wrists, causing the hand joints to become inflamed. Eventually, as a result of these modifications, RA begins to damage the joints in the hand and wrist, including wrist joint, Metacarpal joint, Metacarpophalangeal joint, interphalangeal joint and proximal and distal interphalangeal joint.(3)

Based on its anti-inflammatory and analgesic properties, ultrasound is one of the therapeutic modalities frequently used by licensed healthcare professionals for the symptomatic management of RA. Compared to a placebo, ultrasound administered in water to the dorsal and palmar surfaces of the hand increased grip strength. Additionally, ultrasound reduced morning stiffness, marginally increased wrist dorsal flexion, and lowered the number of inflamed and uncomfortable joints.(4). we can help to reduce pain and inflammation by the use of heat application further we move to the rehabilitation part to treat the disability and functional capacity. By reducing pain the ROM of the hand grip may increase .Patient will be able to do their ADLs or functional activity easily. The ROM and grip function significantly improved after a wax bath treatment and active hand workout. Active hand workouts alone can increase ROM, decrease stiffness, and pain with non-resisted motion.

AIM OF THE STUDY

This study aims to relieve pain, prevent from joint damage and improve the functional capability in patients with R.A.

A CASE DESCRIPTION

A 46 year old woman with 7 years of history of RA developed symptoms at hands, knee joint and facial swelling. The main symptoms are swelling pain and lack of power in grasping objects. Patient was diagnosed with RA 7 years ago by the rheumatologists. They carried out all important investigations and medications as needed. The patient currently using anti rheumatic medication. Morning stiffness, fatigue, pain and swelling are the primary complaints of the patients. Patient has no past history of any disease as well as no surgical history. The patient had the present H/O HTN and obesity with wt 82 kg and height 5.2 ft. There was no history of diabetes. Patient had body ache, limited mobility and low functional activity. Patient had difficulty in holding or grasping the objects like grasping a cup and doing the household work. The pain aggravates when the patient adapted to cold weather and relieved by the hot application. Patient wanted to increase the hand power so that she would be able to do her household work. Pain was also the cause of decreasing the functional ability. Patient had complain to making a fist

PHYSICAL EXAMINATION

The hands' mobility was severely restricted, especially in the PIP and MCP joints, according to an objective physical assessment. The little finger of right hand MCP joint was most affected. The swelling was present over the MCP joint and also the facial swelling involved. Patient cannot easily squeeze the hand gripper and sponge ball. During to carry any objectives patient complaining the pain. According to VAS pain at hand:- 6-7 at morning time and more worse at cold weather It will become 9. ROM of fingers measured by goniometer.

TREATMENT PROTOCOL

To improve the hand grip strength and in reducing the pain in first phase for 15 days our goal was to relieve pain and increase the ROM So we apply pain relieving modalities like wax bath for 10mins , UST pulse mode for 7min. and provide active ROM exercise with the help of smile balls and slime balland for improvement of extension ROM of fingers minimal resistance exercise with the help of rubber bands.

In second phase for 15-25 days our goals was to increase hand grip strength, hand muscle extensibility so to improve the strength in this phase we was given different type of hand griper strengthen-repetition 10-15 for thrice a day and also to improve the extensibilityof hand muscle we will provide therabandexercises -Hand grip and twisting, vertical wrist extension and flexion, hand rolled by foam roller- 10x3 .

OUTCOME MEASURES

The recovery of the patient was evaluated on the following outcome measure on VAS scale and ROM check by goniometer. The prognosis was observed by comparing score with the data was taken on 15 to 25 days.

OUTCOME MEASURES	15 DAYS	25 DAYS
VAS Score	3	1
ROM	Right FLX-15 Left FLX-12	Right FLX-25 Left FLX- 20

Comparison of baseline postintervention score

DISCUSSION

According to the study's findings the exercise programme enhanced hand function overall, the wax bath therapy had no further significant effects, although the pain was instantly relieved after treatment after wax bath patient get relieved from stiffness in hand. After 25 days of treatment plan we observe that their was marked improvement in the ROM of fingers and strength was developed in hand. Activities of daily living are restricted for RA patients. Patients with RA need a lot of help with personal care, according to Dominick et al. The patient was told to utilise a wax bath to reduce the painful, swollen joints in their hands. Additionally, the patient was told to squeeze a soft sponge ball as tolerated. The ball may be wrapped around by fingers because it is small enough to fit in one hand. When using the sponge ball, the patient experienced no adverse side effects. Exercises with the hands were necessary to increase functional independence and hand function. Squeezing the sponge ball was a simple hand-function improvement exercise. As the patient gained greater independence, the quality of their lives began to improve.

CONCLUSION

This case report is consistent with recent studies that show wax bath therapy, UST and active ROM exercises with strengthening using smile balls, and resistive exercise with rubberband for individuals with rheumatoid arthritis. After completing physiotherapy intervention, there was a noticeable improvement in the ROM and functional capability. According to VAS scale the pain was also reduced and stiffness was decreased and patient was able to do house hold activities . she was having no pain while grasping and holding the objects. For further improvement we asked patient for the home exercise program where she can do exercise independently for more better outcomes.

REFERENCES

1. Rheumatoid Arthritis: A Brief Overview of the Treatment Jacqueline Bullock, ^aSyed A.A. Rizvi, ^{b,*}Ayman M. Saleh, ^cSultan S. Ahmed, ^dDuc P. Do, ^eRais A. Ansari, ^dand Jasmin Ahme
2. Physiotherapy in Rheumatoid Arthritis Vural Kavuncu, MD and Deniz Evcik, MD
3. Książopolska-Orłowska K, Sadura-Sieklucka T, Kasprzak K, Gaszewska E, Rodkiewicz-Bogusławska A, Sokołowska B. The beneficial effects of rehabilitation on hand function in patients with rheumatoid arthritis. Reumatologia 2016;54(6):285. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5241364/> (last accessed 20.3.2020) NICE Rheumatoid arthritis in Adults: Management Available from: <https://www.nice.org.uk/guidance/ng100/chapter/Recommendations> (last accessed 20.3.2020) Rheumatoid Arthritis updated feb 2020 Krati Chauhan; Jagmohan S. Jandu; Amandeep Goyal; Pankaj Bansal; Mohammed A. Al-Dhahir. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK441999/> (last accessed 20.3.2020) Radiopedia RA Available from: <https://radiopaedia.org/articles/rheumatoid-arthritis> (last accessed 20.3.2020)
4. Therapeutic ultrasound for the treatment of rheumatoid arthritis Lynn Casimiro Lucie Brosseau Vivian Welch Sarah Milne Maria Judd George A Wells Peter Tugwell Beverley Shea -
5. Sandy B, Ganz PT, Harris LL. General overview of rehabilitation in the rheumatoid patient. Rheum Dis Clin North Am. 1998; 24: 181-201. [PubMed] [Google Scholar] Wade TD. Measurement in Neurological Rehabilitation. New York: Oxford University Press; 1992:189. [Google Scholar] Harris ED, McCroskery PA. The influence of temperature and fibril stability on degradation of cartilage collagen by rheumatoid synovial collagenase. N Engl J Med. 1974; 290: 1-6. [PubMed] [Google Scholar]
6. Oosterveld FG, Rasker JJ. Effects of local heat and cold treatment on surface and articular temperature of arthritic knees. Arthritis Rheum. 1994; 37: 1578-1582. [PubMed] [Google Scholar]
7. Fredrikus GJ, Oosterveld FG, Rasker J. Treating arthritis with locally applied heat or cold. Semin Arthritis Rheum. Semin Arthritis Rheum. 1994; 24: 82. [PubMed] [Google Scholar]
8. Mainardi C, Walter JM, Spiegel PK, Goldkamp OG, Harris ED. Rheumatoid arthritis: failure of daily heat therapy to affect its progression. Arch Phys Med Rehabil. 1979; 60: 390-392. [PubMed] [Google Scholar]
9. Mannheimer C, Carlsson CA. The analgesic effect of transcutaneous electrical nerve stimulation (TENS) in patients with rheumatoid arthritis. A comparative study of different pulse patterns. Pain. 1979; 6: 329-334. [PubMed] [Google Scholar]
10. Mannheimer C, Lund S, Carlsson CA. The effect of transcutaneous electrical nerve stimulation (TNS) on joint pain in patients with rheumatoid arthritis. Scand J Rheumatol. 1978; 7: 13-16. [PubMed] [Google Scholar]
11. Kumar VN, Redford JB. Transcutaneous nerve stimulation in rheumatoid arthritis. Arch Phys Med Rehabil. 1982; 63: 595-596. [PubMed] [Google Scholar]
12. Abelson K, Langley GB, Sheppard H, Vlieg M, Wigley RD. Transcutaneous electrical nerve stimulation in rheumatoid arthritis. N Z Med J. 1983; 96: 156-158. [PubMed] [Google Scholar]
13. Levy A, Dalith M, Abramovici A, Pinkhas J, Weinberger A. TENS in experimental acute arthritis. Arch Phys Med Rehabil. 1987; 68: 75-78. [PubMed] [Google Scholar]
14. Jarit GJ, Mohr KJ, Waller R, Glousman RE. The effects of home interferential therapy on post-operative pain, edema, and range of motion of the knee. Clin J Sport Med. 2003; 13: 16-20. [PubMed] [Google Scholar]

15. Johnson MI, Tabasam G. An investigation into the analgesic effects of interferential currents and transcutaneous electrical nerve stimulation on experimentally induced ischemic pain in otherwise pain-free volunteers. *Phys Ther.* 2003; 83: 208-223. [[PubMed](#)] [[Google Scholar](#)]
16. Fam AG. Spa treatment in arthritis: a rheumatologist's view (editorial). *Br J Rheumatol.* 1993; 23: 771-773. [[Google Scholar](#)]
17. O'Hare JP, Haywood A, Summerhayes C, et al. Observations on the effect of immersion in bath spa water. *BMJ.* 1985; 291: 1747-1751. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
18. Becker BE. The biologic aspects of hydrotherapy. *J Back Musculoskel Rehabil.* 1994; 4: 255-264. [[PubMed](#)] [[Google Scholar](#)]
19. Elkayam O, Wigler I, Tishler M, et al. Effect of spa therapy in Tiberias on patients with rheumatoid arthritis and osteoarthritis. *J Rheumatol.* 1991; 18: 1799-1803. [[PubMed](#)] [[Google Scholar](#)]
20. Sukenik S, Neumann L, Flusser D, Kleiner-Baumgarten A, Buskila D. Balneotherapy for rheumatoid arthritis at the Dead Sea. *Isr J Med Sci.* 1995; 31: 210-214. [[PubMed](#)] [[Google Scholar](#)]
21. Evcik D, Kizilay B, Gokcen E. The effects of balneotherapy on fibromyalgia patients. *Rheumatol Int.* 2002; 22: 56-59. [[PubMed](#)] [[Google Scholar](#)]
22. Van Tubergen A, Boonen A, Landewe R, et al. Cost effectiveness of combined spa-exercise therapy in ankylosing spondylitis: a randomized controlled trial. *Arthritis Rheum.* 2002; 47: 459-467. [[PubMed](#)] [[Google Scholar](#)]
23. Strauss-Blasche G, Ekmekcioglu C, Klammer N, Marktl W. The change of well being associated with spa therapy. *Forsh Komplementarmed Klass Naturheilkd.* 2000; 7: 269-274. [[PubMed](#)] [[Google Scholar](#)]
24. Kuboto K, Kurabayashi H, Tamura K, et al. A transient rise in plasma beta endorphin after a traditional 47.0C hot-spring bath in Kusatsu-Spa, Japan. *Life Sci.* 1992; 15: 1877-1880. [[PubMed](#)] [[Google Scholar](#)]
25. Kappel M, Diamant H, Hansen MB, et al. Effects in vitro hyperthermia on the proliferative response of blood mononuclear cell subsets, and detection of interleukins 1-6, tumor necrosis factor-alpha and interferon-gamma. *Immunology.* 1991; 73: 304-308. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
26. Chan AS, Vallbona C. Immobilization. In: Garrison SJ, ed. *Handbook of Physical Medicine and Rehabilitation.* Philadelphia, Pa: Lippincott Williams and Wilkins; 2003:152-160. [[Google Scholar](#)]
27. Callinan NJ, Mathiowetz V. Soft versus hard resting hand splints in rheumatoid arthritis: Pain relief, preference and compliance. *Am J Occup Ther.* 1995; 50: 347-353. [[PubMed](#)] [[Google Scholar](#)]
28. Falconer J. Hand splinting in rheumatoid arthritis: a perspective on current knowledge and directions for research. *Arthritis Care Res.* 1991; 4: 81-86. [[PubMed](#)] [[Google Scholar](#)]
29. Philips CA. Management of the patient with rheumatoid arthritis: the role of the hand therapist. *Hand Clin.* 1989; 5: 291-309. [[PubMed](#)] [[Google Scholar](#)]
30. Ouellette EA. The rheumatoid hand: orthotics as preventive. *Semin Arthritis Rheum.* 1991; 2: 65-72. [[PubMed](#)] [[Google Scholar](#)]
31. Kjelen I, Moller G, Kvien T. Use of commercially produced elastic wrist orthosis in chronic arthritis: a controlled study. *Arthritis Care Res.* 1995; 8: 108-113. [[PubMed](#)] [[Google Scholar](#)]

32. Voloshin D, Wosk J. Influence of artificial shock absorbers on human gait. *Clin Orthop*. 1981; 160: 52-56. [[PubMed](#)] [[Google Scholar](#)]
33. Culic DD, Battaglia MC, Wichman BS, Schmid FR. Efficacy of compression gloves in rheumatoid arthritis. *Am J Phys Med*. 1979; 58: 278-284. [[PubMed](#)] [[Google Scholar](#)]
34. Nicholas JJ. Physical modalities in rheumatological rehabilitation. *Arch Phys Med Rehabil*. 1994; 75: 994-1001. [[PubMed](#)] [[Google Scholar](#)]
35. Neumann DA. Biomechanical analysis of selected principles of hip joint protection. *Arthritis Care Res*. 1989; 2: 146-155. [[PubMed](#)] [[Google Scholar](#)]
36. Steultjens E, Dekker J, Bouter L, Schaardenburg D, Kuyk M, Ende C. Occupational therapy for rheumatoid arthritis. *Cochrane Database Syst Rev*. 2004; 1: CD003114. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
37. Dhondt W, Willaeyts LA, Verbruggen A, Oostendorp RAB, Duquet W. Pain threshold in patients with rheumatoid arthritis and effect of manual oscillations. *Scand J Rheumatol*. 1999; 28: 88-93. [[PubMed](#)] [[Google Scholar](#)]

