



Effectiveness of Manual Physical Therapy and NSAIDs as a Combination Therapy in Arthritis Patient-A Case Series

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ABSTRACT

Among various types of arthritis Osteoarthritis (OA), Psoriatic arthritis (PA) and Gouty arthritis (GA) are the major ones which have been studied and cause hindrance in movements in many patients. Here we have discussed the treatment modality, a combination of manual therapy and NSAIDs (Ibuprofen) for relieving the symptoms of arthritis. A total of six patients were included consisting of osteoarthritis, psoriatic arthritis and gouty arthritis who presented at the medical office of Dr. Barengolts (MD in USA) and Aybek Izzatov (MD in Uzbekistan) Tyan Anmo Massage School. The study was conducted from October 2019 to March 2020. The treatment consisted of 30 sessions performed for half a year, one week per month (5 days in a month). Significant improvement in symptoms was seen as after 6 months we saw there was reduction in morning stiffness and improved range of motion. The pain score shifted from 5-6 to 2-3 on VAS pain scale. The results signify that the combination therapy wherein manual therapy and NSAIDs worked in an effective way to reduce the level of severity of pain and other associated symptoms.

Keywords: Osteoarthritis (OA), Psoriatic arthritis (PA) and Gouty arthritis (GA), Manual therapy and ibuprofen

INTRODUCTION

The word arthritis is a combination of two words arthron and itis which means joint inflammation. Arthritis is a type of joint deformity involving inflammation of one or more joints. There are at least 100 different kinds of arthritis studied till date [1]. To name a few of these they are Osteoarthritis (OA) also called as degenerative joint disease which is the most common type followed by Psoriatic arthritis (PA), Infectious arthritis (IA), Spondyloarthritis (SA), Rheumatoid arthritis (RA), Gouty arthritis (GA), Pseudogout or Calcium Pyrophosphate Deposition Disease (CPPD) and various other types of autoimmune diseases. Arthritis can also be undifferentiated which does not fit into any existing clinically defined categories [2]. The most common complaint raised by patients is joint pain, which depends on numerous factors. It can be due to the injury or damage caused to the joint from any disease, inflammation around the joint, continuous wear and tear due to day to day strenuous activities, obesity causing excessive pressure on the joints and strain impacted upon painful and rigid joints causing severe fatigue and weakness [3].

Among various types of arthritis Osteoarthritis (OA), Psoriatic arthritis (PA) and Gouty arthritis (GA) are the major ones which have been studied and are the cause of hindrance in many patients. Here is a brief overview regarding each to understand how they are characterized clinically.

OA is a joint disease which is encountered on a global level causing chronic and debilitating joint deformity in the patients. It demonstrates degenerative changes to the parts associated around the joint including the cartilages, bone, ligaments, synovial tissue and menisci. Though it can target any area of the body but it is seen to affect the hips, knees, finger joints, thumb joints and lower spine more commonly. The patient generally complains of pain, stiffness, limitation in joint movements, tenderness and a grating type of sensation [4].

The etiology behind this degenerative disorder depends on various factors such as damage caused due to continuous wear and tear, obesity, old age and trauma to the joint [5]. The true process of its progression is not properly understood [6]. There is damage to the articular cartilage which eventually results in a shift of the normal biomechanical

properties [7]. This degradation causes a loss of joint space, focal loss of articular cartilage, development of synovitis, remodeling of periarticular bone and formation of osteophyte and subchondral cysts [8,9].

It is seen that the incidence of OA increases with age as seen on the Radiographs (RG) where 72.1% of symptomatic participants and 41.6% of asymptomatic participants aged 40 or older showed radiographic changes pointing towards OA [10]. Though, a variation exists in determining the outcome and changes displayed on RG [11]. The diagnosis of OA cannot be solely based on RG findings as clinically also the key features help in detection of the level of pain and discomfort [12,13]. The soft tissue changes seen in the affected joints show a decrease in the strength, limitation in range of motion and increased contracture of the soft tissue [14]. All these results in joint pain, increased level of discomfort while performing day to day activities and decreases the flexibility. The patient limits his movements and other physical functions to decrease the pain [9]. Generally, if diagnosed at the initial stage it can be improved with various types of physical therapies, pain relieving medications and a change in lifestyle. At the advanced stage it is treated with arthroplasty (knee), which remains the last resort to manage the progressive condition [15,16].

The other type of arthritis which has gained a lot of attention over the last decade is Psoriatic arthritis (PsA). It is a disease which displays different characteristics at different sites such as spondylitis, dactylitis, enthesitis and peripheral arthritis [17]. There is also presence of extra-articular manifestations like recurrent uveitis which affects the therapeutic decisions [18,19]. It is a very aggressive degenerative disease which can also cause increased cardiovascular mortality [20]. A patient with a past history of psoriasis who has inflammatory arthritis is diagnosed as a PA case. Although about 10% to 20% of patients do not have any skin involvement by psoriasis but other findings should be looked for such as psoriasis involving nail, scalp, natal cleft etc [21]. It is reported that that up to 50% of untreated patients may end up in damaging their joints, leading to deformity and disability. Therefore, immediate attention must be paid to treat this disease in the initial stage itself [21].

Another arthritis affecting the joints profoundly is Gout. It is a result of the accumulation of Monosodium urate crystals (MSU) in tissues. These crystals are formed when the Serum uric acid (SUA) level increases beyond a specific threshold. Even though the main cause of deformity in gout is hyperuricemia, still many people do not develop gout. In fact, only 5% of people with hyperuricemia above 9 mg/dL develop gout. This highlights that there are other factors which impact its progression such as genetic predisposition [22,23]. MSU crystals form the basis for diagnosing GA. Dietary modification and usage of serum uric acid lowering drugs will help in lowering the SUA levels below deposition threshold levels. The treatment should aim at the dissolution of the crystals [24,25].

On physical examination the clinical features of arthritis may present following features such as pain and tenderness around the concerned joint, reduced range of motion due to pathologic modifications around the inflamed area, synovitis (warmth, swelling, effusions). Deformity or instability is a late presentation, suggesting changes in the periarticular joint structures. Patients with long standing history of arthritis may also suffer from muscle wasting and weakness. Clinical examination should be conducted including ROM, physical function, assessment of gait and other social or physiological factors that might influence the perception of pain [26].

The treatment of arthritis currently relies on reducing symptoms rather than managing the progression of the disease [7]. An evidence based approach should be implemented to manage the symptoms and progression of the disease [27]. Presently either of these methods are used to halt the symptoms medications, physical therapy and surgical approach. To get relief from pain NSAIDs have been used widely [28]. As the number of sufferers affected with arthritis is growing globally, most of the physicians implement various kinds of manual therapy which might also include various strength-based and exercise programs as a part of the treatment. But it is hypothesized that a combination of individualized manual therapy when combined with analgesic medications will help in reducing the pain and improve the ROM in a much better way than using manual therapy alone. Among the different classes of drugs which might be used Non steroid anti-inflammatory drugs (NSAIDs) can help in reshaping and improving the joint structure such as the synovium which is damaged due to disease progression. NSAIDs might work as a disease-modifying agent in arthritis patients but this has not been demonstrated clinically [29].

Therefore to bridge the gap between the use of manual therapy and drugs, a combination therapy is used in the present research article to demonstrate the outcome in the arthritis patients (OA, PA and GA).

MATERIALS AND METHODS

In this case series, total ten cases of arthritis were included initially, out of which 4 dropped out as they could not comply with the treatment protocol. The six patients consisted of osteoarthritis [4], psoriatic arthritis [1] and gouty arthritis [1] who presented at the medical office of Dr. Barengolts and Dr. Izzatov Tyan Anmo Massage School. The study was conducted from October 2019 to March 2020. These patients were analyzed through a retrospective chart review as part of the screening process in an early arthritis clinical trial, and this study was approved at the medical office of Dr. Barengolts and Tyan Anmo Massage School. The patients provided informed consent and agreed to have their nonidentifiable information used for research, including publishing purposes.

Case 1

A 64 years old male presented with a diagnosis of osteoarthritis of the left elbow joint, after he had a fracture and abnormal fusion 20 years ago. On clinical examination we observed that movement range was only 40%. We advised him for a combination therapy, involving the manual therapy and drugs as it has shown effective results to improve and help in the restoration of blood circulation in the para-articular and articular tissues. He was advised to take Ibuprofen 600 mg 2 times a day after completion of session of manual treatment. For half a year the patient received total 30 sessions, one week per month. After 6 months we observed that on physical examination it was seen that the range of motion increased to 60% as measured by the angle of the joint-forming bones. The joint circumference also decreased by 0.5 cm. Also on the VAS pain scale (1-10), the score shifted from 5 to 2.

Case 2

A 60 years old female reported to us with a diagnosis of osteoarthritis involving spine and hip along with bursitis. She shared the history mentioning that the disease began about a year ago with a gradual worsening of her pain and limiting her movements. She was unable to sleep on the left side due to secondary bursitis and arthritis of the hip joint such that after few years spinal stenosis also began. She was prescribed 600 mg of ibuprofen 2 times a day after completion of her manual therapy. She underwent the treatment for 6 months where 25 sessions of manual treatment were given for 5 consecutive days in a month. After the completion of the treatment her range of movement shifted from initial 30% to 60%. Also on the VAS pain scale (1-10), the score shifted from initial 6 to 3. Due to the combination therapy the condition improved drastically and she was able to sleep without any pain in the thigh.

Case 3

A 48 years old male was diagnosed with psoriasis involving the nails and psoriatic arthritis of the fingers. He reported that the disease began 12 years ago. The chief complaint was morning stiffness in all joints which lasted up to 30 minutes. On clinical examination sausage-shaped fingers were identified. There was spinal stenosis due to degenerative changes in the vertebrae and osteoarthritis of the lower back was also present. We checked that 2-3 lumbar vertebrae were also affected. He mentioned that he could not sleep on his back and was unable to straighten his back. There was a constant mild back pain involved. He was advised to take 600 mg of ibuprofen twice a day after the manual therapy was completed. He received 30 sessions for half a year, one week per month (5 days in a month). After examining 6 months later we saw that the circumference of the fingers decreased by 0.1 cm. Also, the morning stiffness lasted for only about 5 minutes which was initially 30 minutes. The pain score shifted from 6 to 4 on VAS pain scale. There was marked improvement in his symptoms.

Case 4

A 63 years old male was diagnosed with gout such that it affected his big toe on left foot and involved both his knees. The patient mentioned that his disease began 3 years ago which kept on increasing in severity with time. He underwent treatment which involved cortisone in the left knee, given twice but there was only temporary success that lasted for one month. On clinical examination it was seen that movement in the right knee was only 40% and in the left knee 30%. He received 600 mg of ibuprofen twice a day after the manual therapy was completed. For half a year he received 30 sessions, one week per month for 5 days. After the medication and manual therapy course was completed the severity of the symptoms reduced to a great extent. The circumference of the big toe decreased by 0.1 cm. The range of motion of the knee joints increased to 60% on the right foot and 50% on the left. On the VAS pain scale, the pain score shifted from 5 to 2.

Case 5

A 58 years old female patient was diagnosed with osteoarthritis of the cervical joints, c-3-4-5. She explained that the disease began 5 years ago. She complained of morning stiffness which lasted up to 15 minutes and there was a constant moderate pain in the neck. Her range of motion was about 50%. She also informed that to get relief from the stiffness and pain she took muscle relaxants. She was prescribed 600 mg of ibuprofen 2 times a day after completion of her manual therapy. She underwent the treatment for 6 months where 25 sessions of manual treatment were given for 5 consecutive days in a month. After completion of the entire treatment we saw there was vast improvement in her symptoms. The pain score reduced to 3 from an initial 6 score when detected via VAS pain scale. The range of motion increased up to 70%. The pain also occurred intermittently which was mild in the morning lasting for about 10 minutes.

Case 6

A 60 years old male patient was diagnosed with osteoarthritis of the left knee. He gave a history of the problem which started 20 years ago. He twice received cortisone in the left knee. There was only temporary success lasting for about 3 months. On clinical examination we observed that movement in the left knee was 60%. He received 600 mg of ibuprofen twice a day after the manual therapy was completed. For half a year he received 30 sessions, one week per month for 5 days. After the medication and manual therapy course was completed the severity of the symptoms reduced to a great extent. The ROM of the knee joints increased to 80%. The pain score shifted from 6 to 3 on a VAS pain scale.

DISCUSSION

In this case series, we present six patients presenting with osteoarthritis, psoriatic arthritis and gout at the medical office of Dr. Barendolts and Tyan Anmo Massage School from October 2019 to March 2020. A lot of research has been conducted involving different modalities for treating arthritis and have paid attention to physical therapy including exercises and medications. Very less focus has been paid to manual therapy approaches. It has been used for different kinds of arthritis mainly in OA of the knee [30,31] with or without other interventions.

In our present study we have highlighted the combination therapy wherein manual therapy and NSAIDs worked in an effective way to reduce the level of severity of pain and other associated symptoms.

As it is commonly known that the knee joint and other joints which have to bear the maximum amount of body weight including joints of the spine and hip have showed degenerative changes as age progresses [32]. A higher degree of arthritis especially OA is evident in females and elderly people [33,34]. Previous literature has demonstrated that OA accounts for the knee pain in most of the population [35]. Arthritis not only impacts physically but it changes the overall quality of life shifting the social and mental well-being [36,37].

Presently, the treatment of most of the arthritis mainly, OA, PA and gout pays attention to take care of the symptoms which can reduce the pain and discomfort rather than establishing a well-defined treatment guideline for the management of the disease. The techniques associated with manual therapy which has been used in the present study has demonstrated to stabilize the joint capsule, brings flexibility to the joint movement within patient's tolerance limit, breaks and loosens the adhesions of the associated articulations, restores the blood circulation and eventually reduces the amount of swelling and inflammation in the affected joint.

It is to be noted that an evidence based approach should be used for treating arthritis such that the affected patient should be made aware of the arthritis signs and symptoms, management methods like pain reductions techniques, modes to promote functionality, stability and factors that could halt the progression of the disease [27]. Generally for the treatment, pharmacological, non-pharmacological and surgical interventions are used. The most common medications which are used for arthritis consists of class of analgesics and anti-inflammatory drugs [28]. Current literature demonstrates that NSAIDs can be effective in reducing arthritis associated pain [38]. Along with the manual therapy we have used NSAIDs to provide a balanced treatment wherein the symptoms and disease progression were simultaneously managed. NSAIDs are among the drugs that are cost effective and have demonstrated analgesic, anti-inflammatory and anti-pyretic effects.

The analgesic property is mediated by inhibiting PG both in the peripheral tissues and in the central nervous system. Prostaglandin synthesis is associated with the process of inflammation and is regulated by cyclooxygenase-2 and

COX-1 enzymes so they work by causing inhibition of cyclooxygenases mainly COX-1 enzymes. Peripheral nociceptors are sensitized to the chemical mediators such as bradykinin or histamine [39] which are affected by the PG. During any inflammatory process or trauma, the PG are released and reduce the activation threshold of tetrodotoxin-resistant sodium channels located on sensory neurons. The NSAIDs and acetaminophen display analgesic effects as well as PG promotes neuronal sensitization.

COX-2 is located at the dorsal horn of the spinal cord where during inflammation its expression increases [40]. It is seen that increased level of PGE2 causes the activation of spinal neurons and microglia that are associated with neuropathic pain [41]. An experiment that was conducted in mice has also confirmed that both COX-1 and COX-2 are linked with nociception as reduction in pain level was seen when the mice was deficient in either COX-1 or COX-2 [42].

NSAIDs are a class of drug that includes various medications. In this study we have treated the patient by prescribing Ibuprofen at a dosage of 600 mg for 6 months, given for a week every month. The medication was advised to be taken after the completion of the manual therapy. Previous literature has highlighted that ibuprofen can be given at different doses such as low dose (400 mg thrice daily) or medium dose (600 mg thrice daily) with the maximum limit of 3200 mg/day [43]. While prescribing Ibuprofen proper care was taken by taking a through complete medical history. As simultaneous use of acetylsalicylic acid and other NSAIDs is associated with various risk factors mainly related to gastrointestinal side effect such as peptic ulcer [44]. The choice of NSAIDs is based on the safety profile of the patient, drug history and any other associated medical condition. Few drugs belonging to the NSAIDs class can cause peptic ulcer even at low dose and the risk increases as the dosage increases [45]. Therefore, we used ibuprofen in this study as it is a very safe drug with no or minimal side effects and greatly improves the sign and symptom of arthritis [46].

The manual therapy is an approach which is commonly used to treat various types of musculoskeletal dysfunction. It can be defined as a procedure wherein specific hands-on techniques are used involving hands-on mobilization which are used by the physiotherapist. It plays a significant role to detect and manage soft tissue and related joint structures so as to modulate pain, promote and enhance range of motion, decrease soft tissue inflammation, increase the joint flexibility by loosening the adhesions, repairing the damaged structures, promote stability of contractile or non-contractile tissue and improve the overall functionality of the joint structures [30]. The manual therapy which we have used here comprised of manipulation and mobilization techniques. Manipulation consists of exerting high level of thrusts applied forcefully while during mobilizations less forceful techniques were applied which we used in all our patients to provide relief from peripheral joint pain and stiffness [47]. Even though very less studies have used manual therapy clinically [48], but our results showed that when combined with NSAIDs it showed tremendous improvement in reducing pain or improving function in all the three types of arthritis.

Current practices have used manual therapy in combination with different types of interventions usually with exercise therapy [49]. Hardly few studies have focused on the approach to combine the benefits of drugs along with manual therapy. Previous studies have shown benefits of manual therapy techniques when used in combination with joint mobility and strengthening exercises [30,50]. A study has found that when mobility exercises were combined with manual therapy procedures showed improvements in the ROM, (11%), pain (33%), and gait speed (11%) after the patient received 12 treatments in a physical therapy clinic over 4 to 6 weeks [50]. Also a study demonstrated the important outcome of manual therapy as there was a 52% improvement in self-reports of function, stiffness, and pain as measured by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scale and a 12% improvement in 6-minute walk test scores when performed by physical therapists for 8 clinical visits [45] whereas the placebo group that performed exercises at home showed no much changes in the pain and ROM score. This highlights that the manual therapy when performed under the supervision of a therapist with proper techniques and correct approach changes the outcome of the disease. Also, it is observed that subjects in the clinic treatment group appeared to be more satisfied with the overall outcome of their rehabilitative treatment than subjects in the home exercise group.

A periodic follow was conducted as a total of 30 sessions were performed extended over a six months period. When a treatment is performed in a clinical setting it is observed that effects of the intervention are adequately maintained when periodic follow up is done. To obtain a higher level of improvement we realized that a total of 30 sessions will show lasting results in the improvement of symptoms. Patient who was unable to tolerate the treatment due to severe pain dropped out from the study and the rest were assured to follow periodic scheduled appointments. Few studies

which have used manual therapy and medications have shown improvements in the outcome as seen in our current study [51].

Arthritis is caused mainly due to limited mobility and adhesions due to recurrent inflammations of both intra-articular and periarticular tissues. Additional symptoms are demonstrated when due to movement restrictions varied changes occur on the articular surfaces such that it is unable to bear the normal level of biomechanical forces. Overall it is clearly evident that manual therapy approach when used with medication (Ibuprofen) showed reduction in the pain and stiffness allowing patients to manage their routine activities with complete independence.

CONCLUSION

In the present study the treatment results have demonstrated that manual therapy along with ibuprofen at a dose of 600 mg significantly improved the pain score, flexibility, ROM and reduced the morning stiffness. Preliminary findings of this study promote future research for scientific protocols in the management of arthritis and other similar degenerative disorders. Large randomized clinical trials should be conducted with increased sample size to define the correct approach in managing arthritis. Large scale research should be conducted to address the dosage and duration of treatment required to resolve signs and symptoms associated with arthritis. Future investigations should study objective measurements of function and pain, with a medium to long term follow up to assess the duration of treatment effect and outcome of this combination therapy.

DECLARATIONS

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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