Antibacterial effect of Bacopa Monnieri (Brahmi) on Swollen Joints – A Case Study

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ABSTRACT

The arthritis is a chronic, inflammatory, autoimmune disease characterized by Pain, edema and stiffness of the joints. Chronic stages of arthritis causes swelling in and around the affected joints. The Siddha herbal medicines are becoming familiar as they possess less adverse effects. Plenty of anti-inflammatory herbs are described in Siddha system of medicine. The plant, bacopa monnieri maintains its original place in the management of various diseases, including arthritis, and acts as anti-inflammatory drug. Hardly a few studies are available to prove the antiarthritic and anti-inflammatory properties of Bacopa monnieri. In ancient Siddha literature Bacopa has been highlighted for its antiarthritic properties especially prescribed to reduce the swelling caused by increased synovial effusion. The current study is aimed to assess the antiarthritic and anti inflammatory properties of Bacopa (Brahmi) paste on swollen arthritic joints. A male patient aged 70 was selected from IPD, Pothu maruthuvam department, Sri Sairam Siddha Medical College & Research Center, Chennai -44. Bacopa Paste applied over swollen arthritic ankle joints showed good progress in very few days of treatment.

INTRODUCTION

Pain is the main symptom in virtually all types of Arthritis. Other symptoms include Swelling, joint stiffness and aching around joints. The three most common types of chronic inflammatory arthritis are rheumatoid arthritis, psoriatic arthritis and ankylosing spondylitis. Swollen joints happen when there’s an increase of fluid in the tissues that surround the joints. Joint swelling is common with different types of arthritis. In chronic arthritis, there’s a wearing down of the cartilage that cushions the ends of the bones.

In conditions of Chronic arthritis Synovial membrane undergo hypertrophy and become oedematous which can lead to ‘cold’ effusions. Reduction of synovial fluid secretion results in loss of nutrition and lubricating action of articular cartilage. Capsule undergoes fibrous degeneration and there are low-grade chronic inflammatory changes. Ligaments Undergoes fibrous degeneration. Muscles Undergo atrophy, as patient, is not able to use the...
joint. Because of presence of pain movements are restricted further.

The patient with arthritis may present with following clinical features. Pain and tenderness in unilateral or bilateral sides and involving single or multiple joints. Usually onset of discomforts very slow, with gradual and intermittent increase of pain. Pain is more on weight bearing joints due to stress on the synovial membrane and later on pain is due to the bone surfaces, which are rich in nerve endings coming in contact. Initially the pain is relieved by rest but lateron pain alarm sleep. Diffuse/sharp and stabbing local pain may be seen depending on the type of arthritis.

The joint usually swells due to synovial fluid collection. Synovitis is more commonly found in rheumatoid arthritis than in other forms of arthritis. It is also present in many joints affected with osteoarthritis (Sivaramakrishna et al., 2005). Synovitis causes joint tenderness or pain, swelling and hard lumps, called nodules. When associated with rheumatoid arthritis, swelling is a better indicator than tenderness. Bacopa monnieri is a perennial, creeping herb native to the wetlands of southern and Eastern India. In Siddha literatures Brahmi is used for many purposes that help in enhancing the brain power. In Tamil it is called as Brahmi. The best characterized phytochemicals in Bacopa monnieri are triterpenoid saponins known as bacosides, with juubogenin or pseudo-juubogenin moieties as aglycone units (Sutton et al., 2009). In many preclinical studies Bacopa was used to prevent and reduce the prostaglandin and arachidonic acid induced inflammatory changes (Viji and Helen, 2011; Shivanand, 2010). Bacopa could be used against swelling induced in arthritis (Baranwal et al., 2011). Bacopa leaves possess antiarthritic properties. When applied over edematous arthritic joints caused by synovitis, swelling would reduce immediately (Scanzello and Goldring, 2012).

Case Study
A 70-year-old male with Osteoarthritis for past 7 years was admitted at our IPD, Sri Sairam Siddha Medical College and Research Center. On presentation he was found to have pain and creaky knee joint, along with Swelling and pain in ankle joint bilaterally (Figures 1 and 2). He had difficulty to move or walk. He was Non-alcoholic, Non-Smoker and had no history of Tattoos or drug. He had no history of recent travel. He had no history of Hypertension, Diabetes mellitus and had Normal Liver function tests and renal function tests. He had no positive family history. He was not obese.

Pitting edema - ankle joints

Figure 1: Right Leg

Figure 2: Left Leg

Figure 3: Bacopa monnieri Paste

After completion of first line of treatment, he was prescribed with internal medicines. Simultaneously, bacopa paste was applied topically over the swollen areas of ankle.

Bacopa paste (BM paste)

Enough amount of fresh Bacopa monnieri plant was collected from the herbal garden of Sri Sairam Siddha Medical College. They are then added to the
blender and grinded with a small amount of water and a smooth paste was prepared (BM paste) (Figure 3).

**Application of BM Paste**

The oedematous ankles were cleaned first with Hot water. BM paste was gently applied over the swollen area by adding little water so that it became sticky and would last for hours on the swollen area. The paste was allowed to dry for about 6 to 7 hrs. After 7hrs the dried paste was washed off with the help of cotton bathed in Warm water (Figure 4).

Bacopa paste was applied regularly once a day. Within 3 days good progress was noticed over the swollen joints. Seven days after treatment the patient had no swelling and felt relaxed to move the limbs (Figure 5).

**RESULTS AND DISCUSSION**

The production of Auto antigens in much Arthritis is due to Denaturation of protein in the body cells and so membrane lysis occurs. All the results of studies on Bacopa stated that Methanolic extracts of Bacopa are proficient in controlling the production of those above mentioned Auto antigens and thus Denaturation of Protein is prevented. This also prevents the cell membrane injury (Volluri et al., 2011).

Arachidonic acid plays a vital role in inflammation reactions related to injury and many diseased states. Increased intake of food with Arachidonic acid exacerbates the symptoms in many patients who suffers from joint pain or some active inflammatory diseases. In a previous study, it was stated that Arachidonic acid (AA) injected into hindpaws of Lewis rats produce a severe edematous response (Prasad et al., 2008).

PGI2 is seen in the synovial fluid of Rheumatoid arthritis (RA) patients. Elevated levels of prostaglandins have been reported in the synovial fluid of RA patients. In the Joints that show chronic inflammation Prostaglandins play crucial role through multifarious relations with White blood cells and other cells.

Use of *Bacopa monnieri* has been mentioned in several ancient Siddha literatures including the Agasthiyar Gunavagadam (Gohil and Patel, 2010). Bacopa is a major ingredient in many formulations that are used for the management of a range of mental conditions including Anxiety, Less Cognition and poor concentration. The plant is also used as a Diuretic and acts as an energizer of the Central Nervous system and the Heart. It is also used in treatment of Asthma, Insanity and epilepsy (Gohil and Patel, 2010; Chopra, 1958). The Plant is used commonly as an immune booster and aids in proper digestion and improves learning (Patwardhan et al., 2010; Kim et al., 2005). In Agasthiyar Gunavagadam it is specifically quoted about the anti arthritic property of Bacopa. It is mentioned that, Bacopa is highly potent in reducing the edema caused by inflammatory changes in osteoarthritis. The ethanolic extract of *Bacopa monnieri* when treated with Chemical mediators like Histamine, Serotonin, Bradykinin and Prostaglandin E (2) and Arachidonic acid induced edema in rats showed very positive results. Bacopa selectively inhibited prostaglandin E(2)-induced inflammation (Kang et al., 2003; Pushkar et al., 2018).

**CONCLUSIONS**

*Bacopa monnieri* paste while applied topically reduced the swelling present over the ankle joint in the above described patient with arthritis. The inflammatory changes produced by various prostaglandins are reduced by Bacopa. Thus it could be considered that Bacopa might have a vital role in reducing various inflammatory changes. Further clinical series to be conducted to evaluate...
the efficacy of Bacopa. Still the mechanism how Bacopa acts remain unclear.

**Funding Support**

NIL.

**Conflict of Interest**

I hereby declare that there is no conflict of interest related to this manuscript.

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