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Quantitative analysis of Copper in arthritic joint effusion and its correlation with Allopathy and Ayurvedic medicinal system.

Bagla H[1], Karvat A[1], Londhe V[2], Savrikar S[3] and Sabnis M[4].*

1. Department of Nuclear and Radiochemistry, Kishinchand Chellaram College, Churchgate- 400020, India.
2. B.Y.L Nair Charitable Hospital & TN Medical College, Dr. A.L. Nair road, Mumbai-400008, India.
3. R.A. Podar Ayurvedic College and Hospital, Worli, Mumbai- 400018, India.
4. Jeevanrekha ayurved chikitsalaya & Research Center, Seawoods, Nerul West, Navi Mumbai - 400 706, India.

Corresponding Author: H.*Bagla* Department of Nuclear and Radiochemistry, Kishinchand Chellaram College, Churchgate- 400020, India.

Copper being an essential element in human biology, its relevance in joint effusion has been served to be a non-invasive diagnostic tool for the characterization of joint diseases. The main objective of present work was to establish the correlation between the levels of copper in the synovial fluids (SF) of patients consuming Antiarthritic Ayurvedic drugs (AAD) and Allopathy medicine. Arthrocentesis was adopted to acquire the samples of joint effusion from proved cases of Osteoarthritis (OA), Rheumatoid arthritis (RA) and Bursitis patients. Patient's population was divided into two categories based on the intake of Allopathy and Ayurvedic Drugs. The control comprised of healthy adult volunteers. The concentrations of copper in joint fluid of patients were assessed by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) analytical technique. It was observed that the patients under the therapy of Antiarthritic Ayurvedic drugs formulation had significantly altering level of mean copper concentration than those under Allopathy drug therapy. Furthermore, the post treatment effects of Antiarthritic Ayurvedic drugs on the amount of copper in joint fluid of patients were fairly analogous to controls. Thus the current study implicates an unequivocal positive alteration of copper in joint fluid of arthritis patients under treatment of traditional medicinal system, thus elucidating its antidote effect for potent joint health. Moreover, it demarcates the two medicinal systems pertaining to its possible elemental variation in joint effusion.

Keywords: Synovial fluid, Osteoarthritis, Rheumatoid Arthritis, Bursitis, Copper, Antiarthritic Ayurvedic drugs

Introduction

According to Ayurveda, vata dosha causes body ache and is basically an air disease. When ama, a toxin produced by a poor digestive system, accumulates within the body it aggravates vata. The ama then circulates in the body and most often gets deposited in the joint areas. The deposited ama causes arthritis in the affected joints. Among the most diagnosed musculoskeleton disorders are Osteoarthritis, Rheumatoid arthritis and Bursitis. The major site of pathology in arthritis is synovium. The synovial fluid is an ultrafiltrate of blood plasma present in between the synovial joints. Also, during inflammation or injury bursitis arises due to accumulation of bursal fluid in the bursae. In arthritic joints, the chemical components of cartilage and synovial fluid degrade, reducing their ability to retain water and limiting their protective properties. Besides, the biomarkers originating from bony tissue changes and cartilage are released in increased amounts into synovial fluid (SF) and thereafter into the blood. Also, the composition of the fluid can reflect either a transudative or exudative etiology; hence the analysis of synovial fluid becomes crucial in assessment of disease.

Cu is one of the essential mineral which helps in maintaining the connective tissue integrity, thus it plays an essential role in joint health[1]. Though the changes in copper concentrations in body fluids and tissues have been reported in literature but its role in most of them is not completely clarified [2].

Cu has been implicated in many musculoskeletal disorders; as long ago as 1938 hypercupreamia[3] was observed in RA, but it was only in 1951 that it was established that Cu complexes can be effective in