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EFFECT OF ETHANOLIC EXTRACT OF *CURCUMIN* ON PHYSIOLOGICAL AND BIOCHEMICAL PARAMETERS IN COMPLETE FREUND'S ADJUVANT INDUCED ARTHRITIC RATS

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ABSTRACT : The current study was undertaken to investigate the anti-arthritic activity of curcumin ethanolic extracts against Freund's complete adjuvant-induced (CFA) arthritis in rats. Arthritis was induced by a single dose (0.1 ml) intra-dermal injection of (CFA) into the right hind paw. Followed by treatment with curcumin extract at two different doses 100mg/kg and 200mg/kg orally for 21 days respectively, as a standard reference, was used diclofenac sodium. Anti-arthritic potential was evaluated in paw thickness, hematological parameters [white blood cells (WBC), lymphocyte, RBC (red blood cells), and hemoglobin (Hb)], biochemical parameters [total protein (TP), albumin, alanine aminotransferase (ALT), aspartate aminotransferase (AST) and C-reactive protein (CRP)]. Radiology and histopathology of hind legs were studied. The results revealed that curcumin treatment and diclofenac in arthritic rats were significantly reduced($P<0.05$) the paw thickness, WBC, CRP, AST, and ALT. While a significant increase in lymphocyte, TP and albumin. Also, there was an improvement in radiology and histopathological changes after the administration of curcumin extract. These results Conclude that use of an extract of curcumin a potent anti-arthritic agent that maybe suggest for treatment of rheumatoid arthritis.

Key words : Rheumatoidarthritis, curcumin, Freund's complete adjuvant, Paw thickness.

INTRODUCTION

Rheumatoid arthritis is one of the most important diseases worldwide, is an autoimmune inflammatory disease accompanied by chronic synovitis, cartilage, and bone destruction, functional loss and disability of joints (Firestein *et al*, 2012). Most commonly, affected the wrist and hands joints on both sides of the body and other parts of the body. Rheumatoid arthritis results through malfunctions of the immune system of the body, targeting healthy tissue and leading to inflammation that causes pain and swelling of the joints, and may ultimately cause permanent joint damage and severe disability. The etiology of Rheumatoid arthritis is unknown and there is no cure (Kadhem, 2016). The most common medication of arthritis treatment is steroidal, non- steroidal anti-inflammatory drugs (NSAIDs) and immunosuppressant drugs. These drugs have side effects that limited their use (Gerlag and Tak, 2008). With these problems, Arthritis therapy has toward to herbal cures deemed safe and effective in all elevating chronic arthritis-related pain.

Curcumin is the essential active constituent of turmeric andits origin is the plant rhizome of Curcuma longa. Curcuminis a member of the Zingiberaceae family found in South Asia and is a popular name-turmeric. The primary active natural of curcumin is polyphenol called diferuloylmethane (Hewlings and Kalman, 2017; Nelson *et al*, 2017). The reported intensively used plant, under different pharmaceutical preparations in Indian and China traditional medicine for various diseases, specifically for local administration such as acne, wounds, parasitic infection and systemic administration such as the urinary tract disease, common cold and liver disease (Chainani-Wu, 2003). Also, curcumin has multiple health benefits, which appear to act through its anti-inflammatory (YueYu *et al*, 2016), antioxidant (Kelany *et al*, 2016), antidiabetic (Gutierres *et al*, 2015) and antitumor effects (Perrone *et al*, 2015).

Complete Freund's adjuvant (CFA) is the best induced experimental animal model for chronic inflammation Rheumatoid arthritis (Snekhalatha *et al*, 2013). A substance consists of mineral oil containing heat-killed mycobacterium when injected in the paw's planter surface, or intra-joint to induce arthritis (El-Gaphar *et al*, 2018). Adjuvant arthritis characterized by chronic proliferative