

News & Comments

Polypeptide Fraction from Aloe Vera Showed the Potential Efficacy against Bone Damage

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Osteoarthritis (OA) is a chronic, progressive, multifactorial disease that often affects the joints. It causes tissue destruction, chronic discomfort, and inflammation, which makes it difficult for limbs to function normally. According to the epidemiological study, the incidence and prevalence of knee OA are directly connected with age, peaking between the ages of 70 and 79. The primary pathologic characteristics of OA are cartilage degeneration and bone remodelling. The function of pro-inflammatory and anti-inflammatory cytokines in bone remodelling has been widely studied by researchers. It has been noted that OA patients' synovial fluids have changed amounts of certain cytokines. The newly developed therapy preserved osteoclast equilibrium by concentrating on the regulators most responsible for joint bone degradation.

Determining AV-effectiveness PP's and potential mechanism of action against bone healing during a surgically produced bone injury in rat models of adjuvant-induced arthritis was the goal of the current study.

The experiment was performed in the Institute Tianshui Hand and Foot Surgery Hospital, Tianshui, China. Wistar rats were obtained from the Tianshui Hand and Foot Surgery Hospital's animal house (adult female, 150–180 g, n = 140). FCA was purchased from Sigma Aldrich in St. Louis, Missouri, USA, to cause AIA. We bought a microliter syringe from Hamilton in Bonaduz, Switzerland.

Methanol, ethyl acetate, toluene, and formic acid were purchased from Merck Life Science Pvt Ltd in India as laboratory-grade chemicals. The supplier of the aloe vera was Muzi Agricultural Ltd. in the Chinese province of Shaanxi. Using a plethysmometer (UGO Basile Italy), the paw volume was measured during the trial period on various days. Using RT-PCR, as previously disclosed, the mRNA levels in synovial tissues (n = 6) were examined. A light microscope was used to assess an impression of histological characteristics. To identify histological abnormalities, a previously described technique was applied.

Tibiotarsal joints' normal architecture was shown by histological investigation of the normal and sham groups, along with slight signs of cartilage loss, inflammation, and synovial proliferation. Nearly 100 M individuals worldwide suffer from osteoarthritis (OA), the most common type of arthritis that is degenerative, crippling, painful, and affects the knee joints. An experimental model was used to assess the bone healing features of adjuvant-induced arthritis (AIA) rats' femurs after surgically inducing an



open fracture. This experimental model closely mimics the clinical features of OA, which include osteoporosis, focal bone erosion at the joint, and systemic bone loss. The AIA control rats showed signs of disease induction, including a decrease in body weight and a halt to growth, which is consistent with an earlier finding.

In recent years, it has become clear that employing a multitarget approach can increase the relevance of drug development for treating complicated and recurrent illnesses, such as OA. Drug resistance or rapid disease progression may develop from the management of chronic diseases with a single molecule target. Thus, in the current study, we found that the injection of an Aloe vera peptide/polypeptide fraction promoted bone healing in AIA rats by inhibiting the RANKL/OPG signalling pathway, activating osteocalcin, and regulating inflammatory cytokine levels. In a rat model of adjuvant-induced arthritis, the current study showed that a polypeptide fraction from Aloe vera may be effective in protecting against surgically caused bone deterioration. Furthermore, the research identified potential pathways of bone healing by blocking the RANKL/OPG signalling pathway, activating osteocalcin, and achieving a balance in these systems.

JOURNAL REFERENCE

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KEYWORDS

Aloe vera, bone healing, osteoarthritis, osteocalcin, osteoprotegerin, polypeptide, RANKL, runx2

