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Therapeutic Potential of Plant Metabolites in Bone Apoptosis: A Review

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Abstract

Osteoporosis is one of the skeletal diseases of major health concern worldwide. Homeostasis of bone occurs with the help of cells, namely, osteoblasts and osteoclasts. Physiological and pathological conditions involve the death of the cells by apoptosis, autophagy, and necrosis. Apoptosis is a key factor in the growth, development, and maintenance of the skeleton. Apoptosis is generated by two pathways: the intrinsic (mitochondria) and extrinsic (death receptor) pathways. Osteoblast apoptosis is governed by the factors like B cell lymphoma 2 (Bcl-2) family proteins, extracellular signal-regulated kinase (ERK), mitogen-activated protein kinases (MAPK), phosphoinositide-3-kinase/ protein kinase B (PI3-K/Akt), Janus kinase 2 (JAK2), bone morphogenetic protein (BMP), and bone matrix protein. Cytokines interact with osteocytes and induce apoptosis. A pro-inflammatory signal stimulates osteocyte apoptosis and increases osteocyte cytokines production. Current therapies have adverse effects which limit their applications. Various plant metabolites have shown beneficial effects on bone. The present review converses about normal bone metabolism and the mechanism of apoptosis leading to bone deterioration. Furthermore, it discusses the role of plant metabolites on bone apoptosis with related indications of efficacy in various experimental models.

Keywords: Osteoporosis; apoptosis; cytokines; osteoblast; osteoclast; plant metabolites.Copyright© Bentham Science Publishers; For any queries, please email at epub@benthamscience.net.[PubMed Disclaimer](#)

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