Title: A Review of Nano-Based Drug Delivery System for the Treatment of Osteoporosis

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Abstract:

Osteoporosis is a silent disease; peoples experiences a fragility fracture occurring at the wrist, vertebra, or hip. Based on WHO calculations, 61 million people in India face osteoporotic difficulties, of which 80 percent are women. Systemic bone disease decreases bone mass, quality, and microarchitecture degradation. Bisphosphonates are usually the first choice for osteoporosis treatment. These include Alendronate, Risedronate, etc. Current therapies for osteoporosis cause changing lifestyles, taking orthopedic drugs, and invasive surgeries. Researchers focused on developing nanomaterials to create innovative and alternative treatments associated with the consequences of osteoporosis. Plant secondary metabolites, such as isoflavones, polyphenols, genistein, lycopene, and carotenoids, have a role in enhancing bone mineral density (BMD) and osteogenesis. The use of drug carriers such as hesperidin, chitosan, collagen, dextran, and alginates helped deliver poorly water-soluble and less bioavailability compounds to make them nano-formulations by minimizing the undesirable side effects. It reduced the dose of medication needed to achieve the therapeutic effect. This study aims to review the nano-formulations used to treat osteoporosis.

Keywords: Osteoporosis, Nano-formulations, Hydroxyapatite