

Emergence of Nanoparticles in Revolutionizing Diabetes Treatment

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Abstract: People have known about diabetic mellitus for 2,000 years. Diabetes is a group of metabolic illnesses characterized by insulin deficiency or resistance. Diabetes prevalence has increased due to age, ethnicity, and lifestyle. One challenge in diabetes management is optimizing drug use to regulate glucose, blood pressure, and cholesterol and minimize side effects. Many researches are focusing on innovative diabetes treatments. Nanomedicine seems to be the most promising option. A brief overview of nanoparticles (NPs) in diabetes treatment is provided in this publication. Better oral insulin administration is needed to reduce daily subcutaneous injections for diabetes. Oral insulin administration may mimic insulin's natural fate in diabetics while reducing injection discomfort and damage. Casein, alginate, calcium pectinate, zinc oxide, chitosan, and other polymer NPs have been utilized to deliver insulin orally. Insulin buccal plus absorption enhancers exhibited 12% maximum pharmacological action. Natural degradability A nanoporous membrane with grafted glucose oxidase surrounds the insulin matrix in polymeric NPs for parenteral insulin delivery. Increased blood glucose alters the nanoporous membrane, causing biodegradation and insulin release. Polymeric nanoparticle-based inhalable medication delivery systems have been studied for TB and cardiovascular disease. This approach can deliver insulin via inhaled nanoparticles. All previous studies indicated that NPs collected in skin and eyes following treatment. These medication delivery techniques are in various stages of development. Nanotechnology offers several medical applications that might heal diabetes and other diseases.

Keywords: Diabetes Mellitus, Nanoparticles, Nanomedicine, Nanotechnology

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