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A Review on Insulin Drug Delivery Systems

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Abstract: *Diabetes Mellitus is a metabolic condition marked by elevated blood sugar levels, the presence of glucose in urine, and increased lipid levels. Currently, India holds the title of the diabetes capital of the world, with an estimated 35 million individuals affected by the condition. This number is projected to rise to 52 million by the year 2025. The two primary forms of diabetes mellitus are Insulin-Dependent Diabetes Mellitus (IDDM) and Non-Insulin-Dependent Diabetes Mellitus (NIDDM). Insulin, a protein hormone, is produced by clusters of cells known as islet cells within the pancreas. The discovery of insulin is credited to Frederick Banting and Charles Best. The hormone consists of 51 amino acids arranged in two chains: Chain A contains 21 amino acids, while Chain B comprises 30. Commonly utilized types of insulin include rapid-acting (such aspart or lispro), short-acting (regular insulin), long-acting (ultra Lente insulin), insulin glaring, and insulin detemir. Various insulin delivery systems are available, including syringes, insulin infusion pumps, jet injectors, and pens. Among these, the insulin syringe is the most widely used and cost-effective option. The insulin pump facilitates continuous subcutaneous insulin infusion therapy. A jet injector employs a high-pressure stream of the injection solution to penetrate the skin, eliminating the need for a needle. The pen is a reusable, prefilled device. Numerous insulin delivery devices are currently in development. This review aims to shed light on the role of insulin as a primary therapeutic agent for diabetes, tracing its historical significance to contemporary applications.*

Keywords: Diabetes mellitus; proteins and peptides; Insulin drug delivery systems

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