Recent Advances in anti-Obesity Drug Development - Pharmaceutical Technology

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Abstract

Obesity is a chronic, multifactorial metabolic condition resulting from the excessive accumulation of adipose tissue in the body. It is associated with increased morbidity and mortality and is strongly linked to a range of comorbid conditions, including type 2 diabetes, cardiovascular diseases, and several types of cancer, such as oesophageal, pancreatic, colon, and breast cancers. Current clinical guidelines recommend the use of approved pharmacotherapy for obese individuals (body mass index [BMI] ≥30 kg/m²) or overweight adults (BMI ≥25 kg/m²) who also present with at least one bodyweight-related comorbidity, such as diabetes, hypertension or dyslipidaemia.

Despite the availability of effective medications, adherence to long-term pharmacotherapy and lifestyle interventions remain limited, highlighting the need for improved therapeutic strategies. Recent advances in pharmaceutical technology have contributed significantly to overcoming traditional barriers in obesity management. Long-acting glucagon-like peptide-1 (GLP-1) receptor agonists, dual incretin mimetics, and combination peptides have transformed obesity management by improving both efficacy and adherence. Sustained-release injectable systems and prefilled user-friendly autoinjectors have enhanced dosing convenience and reduced administration burden. Innovations, such as controlled-release formulations, oral peptide delivery systems, nanocarriers, and combination drug-device platforms have enhanced drug stability, bioavailability and patient compliance.

This review focuses on the most recent pharmacological approaches in treating obesity, emphasizing how emerging pharmaceutical technologies are reshaping drug development, delivery, and therapeutic outcomes in the management of this complex and globally prevalent disease.

Keywords

Obesity, pharmacotherapy, drug delivery, pharmaceutical technology.