IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 3, April 2024

Advancements in Orally Disintegrating Tablets: Formulation Strategies, Drug Delivery Innovations, and Clinical Implications

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Abstract: *This comprehensive review article explores the evolution, formulation strategies, and clinical implications of Orally Disintegrating Tablets (ODTs), also known as Orodispersible or Fast-Dissolving Tablets. The structural abstract aims to provide a concise overview of the key sections covered in the review. The review begins with an insightful examination of the definition and overview of ODTs, elucidating their unique characteristics and mechanisms that facilitate rapid disintegration in the oral cavity. A historical perspective traces the development of ODTs from their inception with the introduction of OraSolv® in the 1980s to the present day, highlighting technological advancements and patient-centric transformations. The subsequent sections delve into critical aspects such as formulation strategies, excipients utilized, and various technologies employed for ODT manufacture. Superdisintegrants, binders, sweeteners, flavoring agents, and disintegration aids are individually explored for their roles in ODT composition and performance. The article navigates through drug delivery innovations, focusing on drug candidates suitable for ODTs, controlled release formulations, and the application of nanotechnology in ODT development. Regulatory considerations, stability issues, and challenges associated with ODT formulations are addressed, providing a comprehensive perspective on the regulatory landscape.Clinical implications and patient acceptance take center stage as the review investigates the benefits of ODTs for patient compliance, explores applications in pediatric and geriatric populations, and discusses taste-masking strategies. Case studies and clinical trials offer practical insights into the real-world impact of ODTs.Challenges and future perspectives shed light on emerging trends such as ODTs for biologics and peptides, addressing environmental concerns, and the integration of smart drug delivery technologies. The article concludes with a summary of key findings and a reflection on the future trajectory of ODTs in pharmaceutical sciences.*

Keywords: Orally Disintegrating Tablets, Fast-Dissolving Formulations, Pharmaceutical Innovation, Patient-Centric Drug Delivery, ODT Formulation Strategies, Nanotechnology in ODTs, Regulatory Considerations, Clinical Implications

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