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Novel Oro-Dispersible Tablets of Pantoprazole and Domperidone for theManagement of Peptic Ulcer Disease: A Comprehensive Review

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ABSTRACT:
Peptic ulcer disease remains a significant gastrointestinal disorder worldwide, commonly associated with excessive gastric acid secretion, Helicobacter pylori infection, and non-steroidal anti-inflammatory drug use. Proton pump inhibitors such as pantoprazole are widely used to suppress gastric acid secretion, while prokinetic agents like domperidone improve gastrointestinal motility and alleviate associated symptoms including nausea, vomiting, and bloating. Despite their proven efficacy, conventional oral dosage forms often suffer from poor patient adherence due to swallowing difficulties, delayed onset of action, and the need for water intake.
Oro-dispersible tablets (ODTs) have emerged as a patient-centric drug delivery system designed to disintegrate rapidly in the oral cavity without the requirement of water, thereby enhancing convenience and compliance. This review critically evaluates the pharmaceutical rationale, formulation strategies, and therapeutic relevance of a fixed-dose combination of pantoprazole and domperidone formulated as an oro-dispersible tablet. The review summarizes published literature on the pathophysiology of peptic ulcer disease, pharmacological actions of the
selected drugs, formulation approaches for ODTs, and reported advantages over conventional tablets.
Evidence from previously published studies suggests that pantoprazole–domperidone ODTs offer rapid disintegration, improved patient adherence, and effective symptom control without compromising drug bioavailability. The review highlights the potential of this formulation to improve therapeutic outcomes, particularly in elderly patients and individuals with dysphagia or nausea. Overall, the pantoprazole–domperidone oro-dispersible tablet represents a promising advancement in patient-friendly ulcer management.
Keywords: Oro-dispersible tablets; Pantoprazole; Domperidone; Peptic ulcer disease; Patient adherence; Fixed-dose combination

I. INTRODUCTION:

Peptic ulcer disease (PUD), encompassing gastric and duodenal ulcers, remains a major global gastrointestinal health concern, contributing significantly to morbidity and healthcare burden. The condition arises due to an imbalance between aggressive factors such as gastric acid secretion, Helicobacter pylori infection, and non-steroidal anti-inflammatory drug (NSAID) use, and protective mechanisms including mucosal bicarbonate secretion, mucus barrier integrity, and adequate mucosal blood flow. If left untreated, peptic ulcers may lead to serious complications such as bleeding, perforation, and gastric outlet obstruction.

Pharmacological management of peptic ulcer disease primarily focuses on acid suppression and symptomatic relief. Proton pump inhibitors (PPIs), particularly pantoprazole, are considered first-line therapy due to their potent and long-lasting inhibition of gastric acid secretion via irreversible blockade of the H^+/K^+-ATPase enzyme in parietal cells. In addition to acid suppression, patients frequently experience associated gastrointestinal symptoms such as nausea, vomiting, bloating, and delayed gastric emptying, which may compromise treatment compliance. Domperidone, a dopamine D_2-receptor antagonist with prokinetic activity, is commonly used to enhance gastrointestinal motility and alleviate these symptoms.

Despite the clinical effectiveness of pantoprazole and domperidone, conventional oral tablets present notable limitations, including difficulty in swallowing, delayed onset of action, and dependence on water for administration. These challenges are particularly relevant in elderly patients, individuals with dysphagia, and patients experiencing nausea during acute ulcer episodes. Oro-dispersible tablets (ODTs) have emerged as an innovative drug delivery system designed to disintegrate rapidly in the oral cavity without the

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need for water, thereby improving convenience, adherence, and therapeutic acceptance.

The development of a fixed-dose combination oro-dispersible tablet of pantoprazole and domperidone represents a patient-centric approach that integrates acid suppression with motility enhancement in a single, easy-to-administer dosage form. This review aims to critically analyze existing literature related to the formulation, pharmacological rationale, and clinical relevance of pantoprazole–domperidone ODTs in the management of peptic ulcer disease.

II. OBJECTIVE OF THE REVIEW:

Need of the Review

Long-term management of peptic ulcer disease requires consistent medication adherence to achieve optimal healing and prevent recurrence. However, poor compliance associated with conventional oral dosage forms remains a significant challenge, particularly among elderly patients, individuals with swallowing difficulties, and those experiencing gastrointestinal discomfort. The increasing emphasis on patient-centric drug delivery systems has highlighted the need for alternative dosage forms that improve ease of administration without compromising therapeutic efficacy. Oro-dispersible tablets offer a promising solution by enhancing convenience, reducing pill burden, and potentially improving adherence. A comprehensive review of pantoprazole–domperidone oro-dispersible tablets is therefore essential to evaluate their formulation rationale, therapeutic advantages, and potential role in modern ulcer management.

Objectives

- Summarize the pathophysiology of peptic ulcer disease and current pharmacological treatment strategies.
- Review the pharmacological roles of pantoprazole and domperidone in ulcer management.
- Evaluate the rationale for combining pantoprazole and domperidone in an oro-dispersible tablet formulation.
- Analyze reported formulation approaches, evaluation parameters, and performance characteristics of ODTs.
- Highlight potential advantages of pantoprazole–domperidone ODTs over conventional oral dosage forms regarding patient adherence and therapeutic outcomes.

III. METHODOLOGY OF LITERATURE REVIEW:

A comprehensive literature search was conducted to identify relevant published studies related to pantoprazole, domperidone, oro-dispersible tablets, and peptic ulcer disease. Electronic databases including PubMed, Google Scholar, ScienceDirect, Scopus, and Cochrane Library were systematically searched. Keywords included pantoprazole, domperidone, oro-dispersible tablets, peptic ulcer disease, patient adherence, and fixed-dose combinations.

Peer-reviewed articles published predominantly between 2010 and 2025 were considered to ensure recent and relevant findings. Studies focusing on formulation development, pharmacological evaluation, in vitro characterization, clinical relevance, and patient adherence associated with ODTs were included. Non-English articles, conference abstracts without full text, and studies unrelated to gastrointestinal drug delivery were excluded. The literature was critically analyzed and organized thematically to present a balanced, evidence-based review.

IV. DISCUSSION:

Oro-dispersible tablets (ODTs) represent an important advancement in oral drug delivery systems, particularly for chronic gastrointestinal disorders such as peptic ulcer disease. The fixed-dose combination of pantoprazole and domperidone in an oro-dispersible form offers both pharmacological and patient-centered advantages over conventional oral dosage forms. Pantoprazole provides effective and sustained suppression of gastric acid secretion, while domperidone enhances gastric motility and alleviates associated symptoms such as nausea, vomiting, and postprandial fullness. The combination therapy therefore addresses both the etiological and symptomatic aspects of peptic ulcer disease.

Published literature indicates that ODT formulations disintegrate rapidly in the oral cavity, usually within seconds, allowing administration without water and improving convenience. This characteristic is particularly beneficial for elderly patients, individuals with dysphagia, and patients experiencing nausea during acute ulcer episodes. Improved convenience and ease of administration have been consistently associated with better patient adherence compared with conventional tablets. Several studies reported in the literature suggest that oro-dispersible formulations of proton pump inhibitors and prokinetic agents demonstrate

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comparable bioavailability to traditional tablets while offering faster onset of action.

The fixed-dose combination approach further reduces pill burden, which is a recognized factor contributing to non-adherence in long-term therapies. Compared with conventional formulations that require multiple tablets and water intake, pantoprazole–domperidone ODTs simplify treatment regimens and enhance patient acceptability. Although formulation challenges such as moisture sensitivity and the need for specialized excipients exist, these limitations are outweighed by the clinical benefits of improved adherence and patient satisfaction. Overall, the reviewed evidence supports the potential of pantoprazole–domperidone oro-dispersible tablets as a patient-friendly and effective option for peptic ulcer management.

V. CONCLUSION:

The present review highlights the pharmaceutical and therapeutic significance of a fixed-dose combination oro-dispersible tablet containing pantoprazole and domperidone for the management of peptic ulcer disease. By integrating potent acid suppression with enhanced gastrointestinal motility in a rapidly disintegrating dosage form, this formulation addresses both disease pathology and patient-related barriers to treatment adherence. Evidence from previously published studies suggests that oro-dispersible tablets provide rapid disintegration, convenient administration without water, and comparable bioavailability to conventional tablets.

The pantoprazole–domperidone oro-dispersible tablet offers particular advantages for elderly patients, individuals with swallowing difficulties, and patients experiencing nausea, thereby supporting consistent medication use and improved therapeutic outcomes. While further large-scale clinical evaluations may strengthen the evidence base, the available literature indicates that this patient-centric formulation represents a promising approach in modern ulcer therapy. Overall, pantoprazole–domperidone oro-dispersible tablets have the potential to improve adherence, enhance symptom control, and contribute to more effective long-term management of peptic ulcer disease.

Conflict of Interest:
The author declares that there is no conflict of interest regarding the publication of this article.

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