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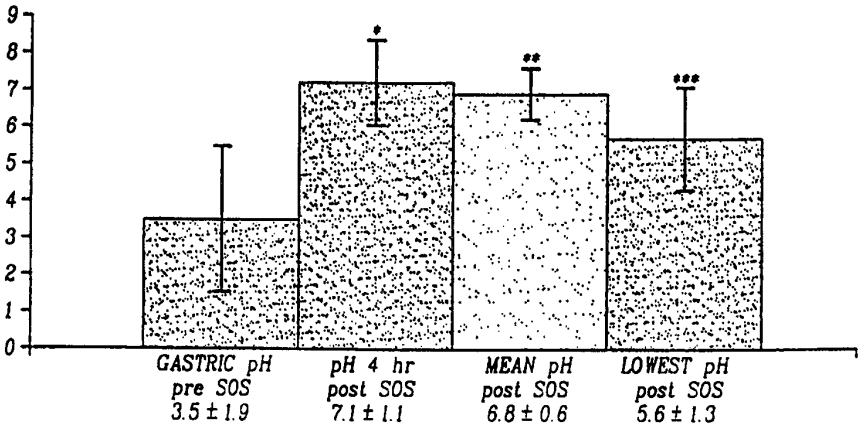

(57) Abstract

A method of treating gastric acid disorders by administering to a patient a pharmaceutical composition including a proton pump inhibitor in a pharmaceutically acceptable carrier including a bicarbonate salt of a Group IA metal where the administering step consists of a single dosage form without requiring further administering of the bicarbonate salt of the Group IA metal. A pharmaceutical composition includes a dry formulation of a proton pump inhibitor in a pharmaceutically acceptable carrier including a bicarbonate salt of a Group IA metal. A pharmaceutical composition for making a dry formulation of a proton pump inhibitor which includes a proton pump inhibitor and a bicarbonate salt of a Group IA metal in a form for convenient storage, whereby when the composition is in a dry formulation which is suitable for enteral administration.

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OMEPRAZOLE SOLUTION AND METHOD OF USING SAME

This application is a continuation-in-part of United States Serial Number 08/680,376 filed on January 4, 1996.

TECHNICAL FIELD

The present invention relates to a pharmaceutical preparation containing a substituted benzimidazole, more specifically known as proton pump inhibitor(s) (ppi). More particularly, the present invention relates to a substituted benzimidazole solution/suspension suitable for oral administration.

BACKGROUND OF THE INVENTION

Omeprazole is a substituted benzimidazole, 5-methoxy-2-[(4-methoxy-3,5-dimethyl-2-pyridinyl) methyl] sulfinyl]-1H-benzimidazole, that inhibits gastric acid secretion. Omeprazole belongs to a class of antisecretory compounds, the proton pump inhibitor that do not exhibit anti-cholinergic or H_2 histamine antagonist properties. Drugs of this class suppress gastric acid secretion by the specific inhibition of the H^+/K^+ ATPase enzyme system (proton pump) at the secretory surface of the gastric parietal cell.

Typically, omeprazole and lansoprazole or other proton pump inhibitors in the form of a delayed-release capsule, is prescribed for short-term treatment of active duodenal ulcers, gastric ulcers, gastroesophageal reflux disease (GERD), severe erosive esophagitis, poorly responsive systematic GERD, and pathological hypersecretory conditions such as Zollinger Ellison syndrome. These conditions are

caused by an imbalance between acid and pepsin production, called aggressive factors, and mucous, bicarbonate, and prostaglandin production, called defensive factors.

These above-listed conditions commonly arise in healthy or critically ill patients and may be accompanied by significant upper gastrointestinal bleeding. H_2 antagonists, antacids, and sucralfate are commonly administered to minimize the pain and the complications related to these conditions. These drugs have certain disadvantages associated with their use. Some of these drugs are not completely effective in the treatment of the aforementioned conditions and/or produce adverse side effects, such as mental confusion, constipation, diarrhea, thrombocytopenia,(lowered platelet count) and/or are relatively costly modes of therapy as they require the use of automated infusion pumps for continuous intravenous delivery.

Patients with significant physiologic stress are at risk for stress-related gastric mucosal damage and subsequent upper gastrointestinal bleeding (Marrone and Silen, 1984). Risk factors that have been clearly associated with the development of stress-related mucosal damage are mechanical ventilation, coagulopathy, extensive burns, head injury, and organ transplant (Zinner et al., 1981; Larson et al., 1984; Czaja et al., 1974; Skillman et al., 1969; and Cook et al., 1994). One or more of these factors are often found in critically ill, intensive care unit patients. A recent cohort study challenges other risk

factors previously identified such as acid-base disorders, multiple trauma, significant hypertension, major surgery, multiple operative procedures, acute renal failure, sepsis, and coma (Cook et al., 1994). Regardless of the risk type, stress-related mucosal damage results in significant morbidity and mortality. Clinically significant bleeding occurs in at least twenty percent of patients with one or more risk factors who are left untreated (Martin et al., 1993). Of those who bleed, approximately ten percent require surgery (usually gastrectomy) with a reported mortality of thirty percent to fifty percent (Czaja et al., 1974; Peura and Johnson, 1985). Those who do not need surgery often require multiple transfusions and prolonged hospitalization. Prevention of stress-related upper gastrointestinal bleeding is an important clinical goal.

In addition to general supportive care, the use of drugs to prevent stress-related mucosal damage is considered by many to be the standard of care (AMA Drug Evaluations). However, general consensus is lacking about which drugs to use in this setting (Martin et al., 1993; Gafter et al., 1989; Martin et al., 1992). In two recent meta-analyses (Cook et al., 1991; Tryba, 1994), antacids, sucralfate, and H_2-antagonists were all found to be superior to placebo and similar to one another in preventing upper gastrointestinal bleeding. Yet, prophylactic agents are withdrawn in fifteen to twenty percent of patients in which they are employed because of failure to prevent bleeding, or control pH (Ostro et al.,

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