Disorders of Gastrointestinal Motility in Critically Ill Patients

Essay

Submitted for Partial Fulfillment of Master Degree in Intensive Care

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List of Abbreviations

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Abb.	Meaning
5-HT	5-Hydroxytryptamine
ANS	Autonomic Nervous System
CCK	Cholecystokinin
CFU	Colony Forming Units
CNS	Central Nervous System
EN	Enteral nutrition
ENS	Enteric Nervous Systems
ETF	Enteral Tube Feeding
GE	Gastric Emptying
GERD	Gastroesophageal Reflux Disease
GI	Gastrointestinal
GRVs	Gastric Residual Volumes
ICC	Interstitial Cells of Cajal
ICU	Intensive Care Unit
IL	Interleukin
MMC	Migrating Motor Complex
PAT	Paracetamol Absorption Test
POI	Postoperative Ileus
SIRS	Systemic Inflammatory Response Syndrome

Abbreviations are alphabetically ordered.

Introduction

And

Aim of work

Introduction

Gastrointestinal (GI) motility disturbances are common in critically ill patients. GI tract dysmotility has been linked to increased permeability of intestinal mucosa and bacterial translocation, contributing to systemic inflammatory response syndrome, sepsis, and multiple organ dysfunction syndromes. A key issue in providing nutrition to critically ill patients is intolerance of enteral feeding because of impaired GI motility **(Marik and Zaloga, 2001).**

Remarkable progress has been made in the understanding of the regulation of GI motility in critical illness. Predominant motility abnormalities seen in intensive care unit (ICU) patients include antral hypomotiliy, delayed gastric emptying, and reduced migrating motor complexes. The diagnosis of motility disturbances can be challenging to establish in critically ill patients. The available tests used for detection of abnormal motility have major limitations in the ICU setting **(Gramlich et al., 2004).**

Recognition of the type and site of intestinal motility disorder is important to guide the therapy and improve the outcome **(Flokhart et al., 2000).**

The etiology of abnormal GI motility in critically ill patients is multifactorial but largely remains unclear. Shock, electrolyte abnormalities, hyperglycemia, disease itself, sepsis, increased intracranial pressure and medications such as catecholamines, dopamine, opioids and propofol, which are often administered to critically ill patients, may contribute to GI tract dysfunction **(Fruhwald et al., 2000).**

Hyperglycemia can disrupt antral motor activity at plasma glucose levels as low as 140 mg/dl. Reduced fundic tone, inhibition of antral pressure waves, and stimulation of pressure waves in the pylorus have also been reported with plasma glucose levels greater than 270 mg/dl **(Spallone, 2004).**

Suppressed vagal nerve activity plays an important role in the inhibition of gastric emptying (GE) in patients with elevated intracranial pressure **(Toumadre, 2001).**

Electrolyte abnormalities such as hypokalemia, hyponatremia, and hypomagnesemia can also contribute to postoperative GI dysfunction. They affect gut motor function by alternating nerve conduction and directly affecting smooth muscle contractility **(Tournadre et al., 2000).**

Shock, Dehydration and hypovolemia can also lead to gut hypoperfusion followed by gut dysfunction **(Lobo et al., 2002).**

GI tract dysfunction has been associated with an increased rate of complications, including aspiration pneumonia, infections, sepsis, bacterial translocation, as well as bacterial overgrowth and adverse outcome **(Inglis et al., 1993).**

Strategies to prevent or treat GI tract dysfunction and feeding intolerance include pharmacologic interventions, use of prokinetic drugs, or change in the enteric access site or route of nutrition support. Gastrointestinal promotility agents may improve tolerance to enteral nutrition, reduce gastroesophageal reflux and pulmonary aspiration, and therefore have the potential to improve outcomes of critically ill patients **(Heyland et al., 1998).**

A one-time dose of erythromycin may facilitate small bowel feeding tube insertion. Administration of metoclopramid appears to increase physiologic indices of gastrointestinal transit and feeding tolerance **(Peeters, 1993).**

Enteral naloxone reduces gastric tube reflux and frequency of pneumonia in critical care patients during opioid analgesia **(Meissner, et al., 2000).**

Aim of the work

The aim of this work is to present an update review on altered gastrointestinal motility in critically ill patients including its pathophysiological basis, identification, treatment and prevention.

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اضطرابات حركية الجهاز الهضمي في مرضى الرعاية المركزة

رسالة مقدمة توطئة للحصول على درجة الماجستير فى الرعاية المركزة

من

الطبيب/أحمد عبد الجليل عبد العليم

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Ahmed Abd Algalil Abd Alaleem

قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

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Chapter (1)

Anatomy of the Gastrointestinal Tract