Gastric Prokinetics in Critical Care

In critically ill patients malnutrition is associated with impaired immune function, impaired ventilatory drive and weakened respiratory muscles leading to prolonged ventilation.

Critical Care patients should generally commence enteral nutrition within 48hrs from admission.

Strategies to optimise delivery of enteral nutrition such as starting at the target rate, use of a feeding protocol, using a higher threshold of gastric residuals volumes and use of motility agents should all be considered to achieve adequate calorific intake.

Delayed gastric emptying is common in critically ill patients because of many factors including medications (e.g. narcotics, catecholamines, neuromuscular blockers, nitrates, calcium channel blockers), hyperglycaemia, renal dysfunction, mechanical ventilation, or the disease process itself.

Drugs that may slow gut function could be reduced or substituted to aid gastrointestinal motility (opiates in particular).

Evidence suggests an association between feeding intolerance, prolonged length of stay and increased risk of death. Although it is possible that this association reflects the underlying severity of illness or a consequence of other unmeasured confounders, feeding intolerance may well be playing a causal role.

For those deemed at specifically high risk of aspiration consider post pyloric (Naso/Percutaneous-jejunal) feeding. Commonly seen in pancreatitis, post oesophageal or gastric surgery.

These can be arranged by contacting Gastroenterology who ca place these in the unit. If there is an expected delay of >48hrs can contact IR to alternatively place these, endoscopic is however the preferred first choice.

NICE suggest - People who have delayed gastric emptying and are not tolerating enteral tube feeding should also be offered a motility agent unless there is a pharmacological cause that can be rectified or suspicion of gastrointestinal obstruction.

Enteral feeding is preferred to parenteral nutrition as it is associated with fewer septic complications, lower risk of bacterial translocation, and is cheaper. There are several therapeutic options that help to overcome feeding intolerance.

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The principal local hormones that modulate gut motility are ghrelin, cholecystokinin (CCK), motilin, glucagon like peptide-1 (GLP-1), serotonin and dopamine.

Metoclopramide, erythromycin and domperidone are the commonest prokinetic agents in current use in the UK.

Metoclopramide is a selective D2 (dopamine) receptor antagonist that enhances peristalsis in the upper gastrointestinal tract.

Domperidone is another D2 receptor antagonist that increases the amplitude of oesophageal motor function and duodenal contractions, and coordinates peristalsis across the pylorus to accelerate gastric emptying.

Erythromycin acts locally to enhance the release of motilin from enterochromaffin cells (interstitial cells of Cajal) of the duodenum. Motilin causes contraction of the duodenum and gastric antrum.

All of these agents have all been shown to prolong the QT interval, and may cause serious dysrhythmias, though reports are generally very low. Up to 35% of ICU patients who receive enteral nutrition have received a prokinetic with no difference in outcomes compared to those receiving parenteral nutrition and no pro-kinetics.

Peripherally acting mu-opioid receptor antagonists, specifically methylnaltrexone, have been shown to facilitate recovery of GI function after surgery; however, to date there are no studies investigating their use as prokinetic agents.

All prokinetic agents display tachyphylaxis after 48hrs and use should generally not exceed 96hrs of continuous use, even if desired effect achieved.

Prokinetics have however failed to show that they significantly reduce the risk of pneumonia, mortality, length of stay in the ICU but do reduce vomiting and potentially associated complications.

There is limited evidence to suggest benefits of one over the other, however consideration of route of delivery, development of associated side effects, anti-microbials resistance can all be taken into consideration when making decisions about appropriate choice. Drug interactions are common with all agents and review should be taken before prescribing.

Prokinetic choice options for Critically ill patients:

1st line - Metoclopramide 10mg IV 8hrly

2nd line – Erythromycin 3mg/kg 8hrly IV or PO 250-500mg 8hrly

3rd line – Domperidone 10mg PO 8hrly

Each of these should be used for 72hrs, if ineffective they should be discontinued or may consider combination therapy of 1st and 2nd line for further 72hrs. If ineffective thereafter they should be stopped.

Other motility agents are used in chronic constipation or intractably slow gut such as **Prucalopride** (5-HT4 agonist) These should only be used after discussion with GI. Cisapride is no longer available for human use in the UK.

References:

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