



PREVENTION OF STRESS GASTRITIS IN THE SICU

H₂-BLOCKERS, SUCRAFATE, AND ENTERAL FEEDS

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PGY-2

STRESS GASTRITIS

- Erosive gastritis
- Unknown pathophysiology
- Occurs in 75-100% of critically ill patients admitted to an ICU
- Clinically important bleeding in 3.5% of ICU patients mechanically ventilated for 48 hours or more
- Can be an entry point for bacteria into the bloodstream/body



RISK FACTORS FOR STRESS GASTRITIS

- Mechanical ventilation (more than 48 hours)
- Coagulopathy
- Neurosurgery
- Shock
- Respiratory failure
- Sepsis
- Polytrauma
- Tetraplegia
- Severe burns >30%
- Multiple organ failure



CONSEQUENCES OF CLINICALLY SIGNIFICANT STRESS GASTRITIS

- Increased mortality
- Demands on blood banks
- Risks of exposure to blood
- Extends ICU stay by 4-8 days



MAIN GOALS OF TREATMENT

- Maintain integrity of the stomach and bowel wall mucosa
- Increasing intragastric pH
- Stimulation of lymphoid tissue in the intestines



CONSIDERATIONS IN SELECTING TREATMENT

- Must be shown to reduce the risk of ulceration
- Pharmacokinetics
- Low risk of side effects
- Decreased risk of infections
- Interactions with other medications
- Cost effective
- How is the drug administered?



PPIS



- PPIs bind irreversibly with the H^+/K^+ ATPase
- PPIs have been shown to be superior at suppressing gastric acidity in patients with chronic conditions such as PUD, GERD, NSAID-associated mucosal damage, ZES
- Are they better than other treatments for preventing stress ulcers in critically ill patients?
- No tachyphylaxis
- pH is more predictable and sustained than H_2 -blockers
- Pharmacokinetics



DRAW BACKS TO PPIS



- Side effects
- Increased risk of ventilator associated pneumonia
- Increased risk C difficile colitis
- Increased incidence enteric infections
- Transitioned to unnecessary home therapy
 - Osteoporosis
 - Vitamin B deficiency
 - Cost



H2-BLOCKERS

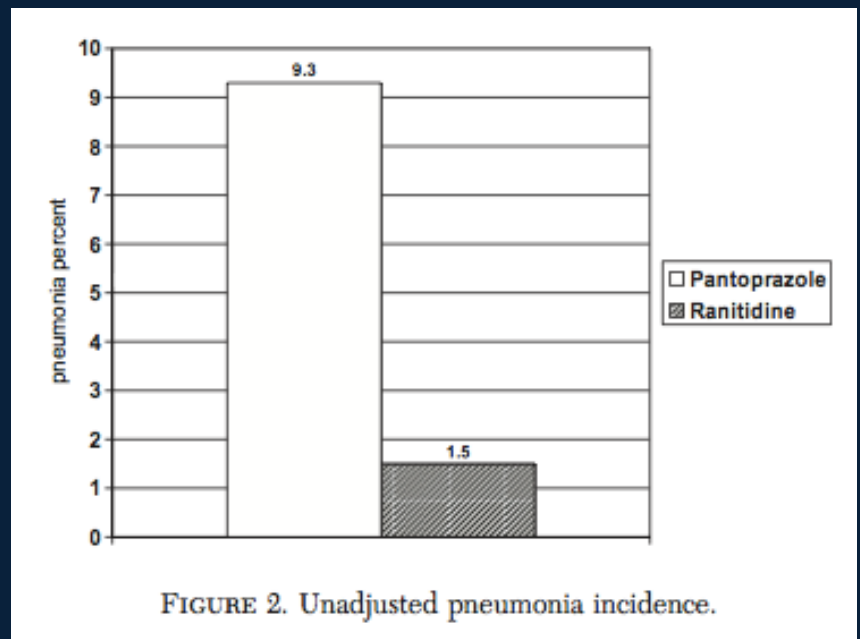


- Competitively block the action of histamine on parietal cells
 - Decreased action of histamine
 - Substance that stimulate release of histamine have a blunted response
- Tachyphylaxis
 - Can develop within 42 hours
 - pH can quickly decrease despite high doses
- Vagally-stimulated acid secretion not inhibited
 - Less useful in neurosurgery/head trauma patients
- Adverse effects
- All are excreted by kidneys
- Drug-Drug interactions

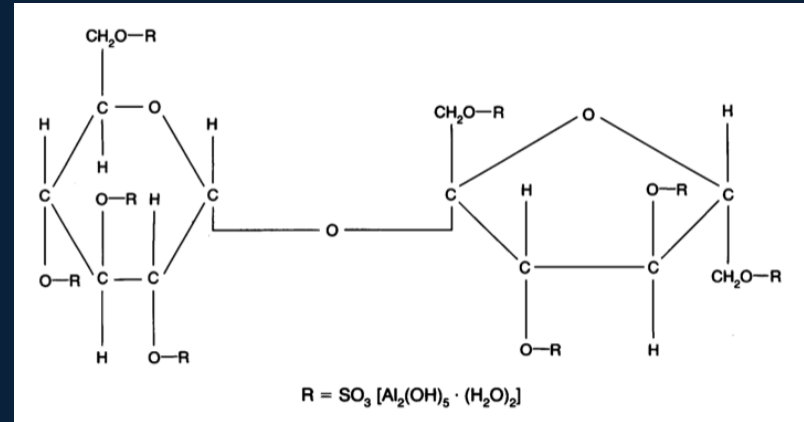


PPIS VS. H2-BLOCKERS

- Ojiako et al.
 - Retrospective chart review of 617 patients receiving famotidine (n=522) vs. pantoprazole (n=95)
 - GI bleeding occurred more frequently in the PPI group (3.2%) than the H2-blocker group (0.38%)
 - Higher acuity in the PPI group
- Miano et al.
 - Retrospective cohort study of the incidence of nosocomial pneumonia in 377 patients who received pantoprazole compared with 457 patients who received ranitidine
 - Cardiothoracic surgery patients
 - Patients who received pantoprazole were more likely to develop VAP



SUCRALFATE



- Aluminum salt
- Mechanism of action
 - Directly coats gastric mucosa
 - Stimulating release of cytoprotective agents – particularly prostaglandin E2 (PGE2)
 - Direct inhibition of growth of bacteria
 - Inhibition of peptic digestion
- Must be given intragastrically – NG or OG tube
- Adverse effects
- Drug binding

SUCRALFATE VS. H2-BLOCKERS

- Maier et al.
- Prospective, randomized trial
- H2-blocker \pm antacid versus sucralfate
- Sucralfate as efficacious as maximal H2 blocker therapy for stress ulceration prophylaxis
- May have beneficial effects on incidence of nosocomial pneumonia
- Sucralfate reduces nursing requirements for stress ulcer prophylaxis
- Cost savings of approximately \$30,000 per ICU bed per year in patient charges



SUCRALFATE VS. H2-BLOCKERS

- Cook et al.
- Prospective, randomized, blinded study comparing sucralfate vs. H2-blockers
- Patients receiving ranitidine had a significantly lower risk of GI bleeding than patients receiving sucralfate (1.7% vs 3.8%; $P=0.02$)
- No difference in the incidence of VAP
- No difference in the length of stay in the ICU
- No difference in length of intubation
- No difference in mortality



ENTERAL NUTRITION

- Buffering of acid
- Direct source of mucosal energy
- Secretion of prostaglandins and mucus
- Stimulation of lymphoid tissue
- Blunting of stress induced vagal stimulation of the stomach



ENTERAL NUTRITION

- Pingleton, et al.
 - Compared enteral nutrition to antacids and to cimetidine
 - 43 ventilated patients were included in the study
 - Twenty-one patients had evidence of GI bleeding
 - 14 of 20 patients receiving antacids
 - 7 of 9 patients receiving cimetidine
 - 0 of 14 receiving enteral alimentation
- Raff, et al.
 - Compared enteral nutrition to cimetidine \pm antacids in burn patients
 - 526 patients over 4 years
 - The overall rate of GI bleeding in the cimetidine \pm antacid group was 8.3%
 - In the enteral feeding group, the overall incidence of GI bleeding was 3.3%
 - This difference was statistically different (<0.05)



H2-BLOCKERS AND ENTERAL FEEDING

- Marik et al. performed a meta-analysis of studies comparing H2-Blockers to placebo.
- 17 studies, total of 1836 patients
- In 3 studies patients received adequate enteral nutrition
- H2-blockers reduced the risk of GI bleeding only in the subgroup of patients who did not receive enteral nutrition
- In the subgroup receiving enteral nutrition:
 - Risk of GI bleeding was not affected
 - Increased risk of hospital acquired pneumonia
 - Hospital mortality was higher in studies in which patients were enterally fed and received an H2-blocker



SUMMING THINGS UP

- Kantorova, et al.
- Single-center randomized, placebo-controlled study
- 287 patients
- 3 prophylactic regimens and placebo
- Clinically significant GI bleeding occurred in:
 - 1% of patients receiving omeprazole
 - 3% of patients receiving famotidine
 - 4% of patients receiving sucralfate
 - 1% of patients receiving placebo
- There was a statistically significant difference in gastric pH and gastric colonization in the groups receiving pH altering medications
- There was no statistically significant difference in length of time on ventilator, length of ICU stay, or mortality



CONCLUSIONS

- Any medication given to critically ill patients carries risks
- The incidence of clinically significant GI bleeding is low but not inconsequential
- Early, continuous gastric feeding should be initiated in the appropriate patient and other prophylaxis should be stopped
- Sucralfate, H2-blockers, and PPIs are all reasonable options for patients not receiving enteral nutrition
- There is no advantage for using PPIs over H2-blockers
- There is data to suggest that H2-blockers are superior to sucralfate in reducing the risk of GI bleed. However, length of ventilation, risk of VAP, length of ICU stay, and risk of death are not significantly different.



THANK YOU!



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