Medication use with enteral feeds

Whenever medications are injected down enteral feeding tubes, syringes must always be incompatible with IV lines to avoid accidental injection of oral medications into the vascular system.

Drug characteristics

Considerations for medications

- Drugs requiring fasting state can be a challenge to dose correctly in enterally fed patients
- Drugs that bind with protein in enteral feeds (e.g. phenytoin) may need altered dosing to achieve adequate levels
- Drugs that bind with PVC feeding tube material (e.g. phenytoin, carbamazepine, diazepam) need extensive post-dose tube flushing and may not achieve therapeutic levels.
- Drugs absorbed only from specific intestinal sites cannot reach therapeutic levels if the site of absorption is bypassed by the feeding tube (e.g. paracetamol, aspirin, warfarin, digoxin, some anti-convulsants, antifungals).
- Drugs causing gastrointestinal symptoms/intolerance
  - **Hypertonic drugs**
    - Cause diarrhoea, rapid transit
    - May delay gastric emptying
  - **Sorbitol-containing**
    - At >10mg/day causes symptoms
    - At >20mg/day causes diarrhoea
  - GIT symptoms may compromise nutritional delivery
- Drugs that must not be crushed:
  The following drugs must **NOT** be crushed due to potential for excessively rapid uptake and toxicity: extended/sustained-release, enteric coated, teratogenic, cytotoxic and sub-lingual drugs
- Certain medications when crushed and dissolved release excipients (salts or ions) which alter the pH of the solution causing poorly bioavailable drug metabolites
- Hydrophobic drugs may not dissolve well in water and may need to be suspended in food oils
- The same drug may not react in the same way at different concentrations in terms of the impact on solution pH and precipitate formation (e.g. mist morphine)
- Multiple crushed drugs should never be combined in a single syringe, because of the high risk of incompatibility reactions, precipitates that may block the tube and the formation of unknown novel drug mixtures
- Chemical interactions between drugs and cations (K, Mg, Ca) in the enteral feed can significantly reduce drug absorption

Nasogastric tubes

Considerations for medications

- Drugs should not be given into the stomach while nasogastric drainage or suction is ongoing
- If patients are being fed continuously, it is difficult to dose medications which require fasting state/empty stomach (examples are certain penicillins and beta-blockers).
- Holding feeds before drug dosing is necessary but may lead to nutritional deficits.

Post-pyloric/small bowel tubes

Pharmacokinetics data on medications delivered directly into the small intestine is scarce. Drugs may require altered dosing.

Considerations for medications

- Drugs designed to act locally in the stomach (e.g. sucralfate, H2-blockers) cannot be used via this route
- Drugs which are activated by low pH or are poorly absorbed at high pH (e.g. iron, warfarin, certain anti-fungals) may not reach therapeutic levels via this route at standard doses
- Drugs which have low solubility in high pH post-pyloric environment (e.g. certain calcium channel blockers, benzodiazepines) may be poorly absorbed
- Potential toxicity may occur with drugs that have a high first pass metabolism (e.g. opioids, tricyclics, beta-blockers, nitrates) due to increased absorption
- Drugs which are degraded in the high pH environment of the duodenum and jejunum (e.g. captopril) may not reach therapeutic levels via this route at standard doses

Rebound toxicity

When higher than standard doses are required to achieve therapeutic drug levels in patients receiving continuous enteral feeding, there is a risk of rebound toxicity if dose is not adjusted down once enteral feeding is stopped.
Monitoring of drug levels may be required in both instances.

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