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Peptic ulcer and NSAIDs

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Abstract :

Non-steroidal anti-inflammatory drugs including low-dose aspirin are some of the most commonly used medicines. They are associated with gastrointestinal mucosal injury.

Before prescribing, it is important to assess the patient's gastrointestinal risk factors such as age and history of peptic ulcers.

So this report will discuss the relation between peptic ulcer and NSAIDs

Introduction:

Gastroduodenal ulceration and bleeding are the major limitations to the use of non-steroidal anti-inflammatory drugs (NSAIDs). The development of safer NSAIDs or of effective therapies for the prevention of the adverse effects of existing NSAIDs requires a better understanding of the pathogenesis of NSAID-induced ulcer disease. NSAIDs can cause damage to the gastroduodenal mucosa via several mechanisms, including the topical irritant effect of these drugs on the epithelium, impairment of the barrier properties of the mucosa, suppression of gastric prostaglandin synthesis, reduction of gastric mucosal blood flow and interference with the repair of superficial injury. The presence of acid in the lumen of the stomach also contributes to the pathogenesis of NSAID-induced ulcers and bleeding, by impairing the restitution process, interfering with haemostasis and inactivating several growth factors that are important in mucosal defence and repair. In recent years, a fuller understanding of the pathogenesis of NSAID-induced ulcer disease has facilitated some new, very promising approaches to the development of stomach-sparing NSAIDs.

Discussion:

Aspirin and many other nonsteroidal anti-inflammatory drugs (NSAIDs), (eg, ibuprofen, naproxen, indomethacin, and ketorolac) are carboxylic acids [1]. Their pKa values range from 3.50 (aspirin) to 4.85 (ibuprofen). As such, they are not ionized at the acidic pH found in the gastric lumen and thus can be absorbed across the gastric mucosa. Once these drugs move from the acidic environment of the gastric lumen into the pH-neutral mucosa, the drugs ionize and are trapped temporarily in epithelial cells where it may damage these cells.

However, this "topical" epithelial injury by many NSAIDs does not appear to be of prime importance in the pathogenesis of clinically important endpoints (symptomatic ulcers). The pathogenesis of symptomatic peptic ulcer disease caused by repeated exposure to NSAIDs is mainly a consequence of systemic (post-absorptive) inhibition of gastrointestinal mucosal cyclo-oxygenase (COX) activity. Even intravenous or intramuscular administration of aspirin or NSAIDs can cause

gastric or duodenal ulcers in animals and humans . Cyclo-oxygenase (COX), the rate-limiting enzyme in prostaglandin (PG) synthesis, converts the unsaturated fatty acid arachidonic acid (C20:4) (derived from phospholipids in cell membranes) into PGG2 and then to PGH2 ([figure 1](#)). The gastric and duodenal mucosa proceed to convert PGH2 to various prostanoids (prostaglandins and thromboxane A2). PGs such as PGE2 protect the mucosal lining from injury by luminal acid-pepsin.

Risk factors:

Gastrointestinal toxicity with NSAIDs, including low-dose aspirin, is highest in patients with risk factors. These include increased age (>65 years), past history of peptic ulcer disease, heart disease, and co-prescription of antiplatelets , corticosteroids and anticoagulants. In addition, using higher doses of NSAIDs leads to an increased risk of upper gastrointestinal complications.⁷ Prolonged NSAID use and *H. pylori* infection are also associated with an increased risk of gastrointestinal toxicity. In patients who are chronic users of NSAIDs and who have no risk factors, only 0.4% have serious adverse events. However, the risk is as high as 9% in patients with multiple risk factors.⁸ Before prescribing for a patient with risk factors always consider if there are alternatives to NSAIDs

conclusion :

Peptic ulcer disease is a well-recognised complication of NSAID use. Inhibition of COX-1 in the gastrointestinal tract leads to a reduction of prostaglandin secretion and its cytoprotective effects in gastric mucosa. This therefore increases the susceptibility to mucosal injury. even though that most cases of peptic ulcer (60% of gastric and 90% of duodenal ulcers) is caused by *H.pylori* . NSAIDs still play a major role in pathogenesis but it must be considered that not every patient that taking NSAIDs will suffer from gastrointestinal ulcers.

References :

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