Peptic Ulcer Disease

Pages with reference to book, From 46 To 48

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An ulcer is defined as the denudation of the cells from the gut to at least the depth of muscularis mucosa. Lesions superficial to muscularis mucosa are called erosions. As peptic proteolysis leads to ulcer so the term “peptic” is used to describe the ulcer. Duodenal bulb is the commonest site of ulcer hut, ulceration in the oesophagus, post bulbar region and meckel’s diverticulum is also frequent (Fisher, 1983).

The etiology of ulcer depends upon three major factors i.e.. Aggressive factors, which damage the mucosa directly (acid, pepsin, bile salts and pancreatic enzymes). Defensive factors, whose disruption leads to mucosal damage (mucus, bicarbonate deficiency, mucosal defects, and blood supply} and miscellaneous factors which are neither aggressive nor defensive (genetic factors, psycho-visceral axis and autoimmune factors) (lsenb erg et al., 1978).

A normal stomach produces about 2--30 meq of acid per hour. High acid load is either due to an increase in the parietal cells mass or due to the diminished release of inhibitory factors that regulate gastric acid secretion and gastrin. Fats and aminoacids in duodenum produce less inhibition of acid secretion in duodenal ulcer.

Release of secretion, which controls the pancreatic bicarbonate decreases, and emptying rates for solids and liquids increase in duodenal ulcer; therefore the dumping (acidic contents into the duodenum might also contribute to ulceration.

Inactive pepsinogens are converted to active pepsin by acid. Peptic activity is maximum at a pH of 2.0 and is absent at pH of 5.0 or above. Any abnormality in the synthesis, release or metabolism of pepsin may contribute to ulceration.

Reflux of small bowel contents into the stomach occurs in gastric ulcer. Bile salts are likely to be toxic to gastric mucosa. It is not yet clear that whether it is the quantity, concentration or chemical structure of the bile salts or some other factor that produces the damage.

The role of pancreatic enzymes in the development of ulcer has not yet been studied. Mucus contains a glycoprotein which swells on contact with water and thus forms a protective layer over the mucosa. Mucus slows the diffusion of hydrochloric acid into and bicarbonate out of the mucosa and thus prevents ulceration.

Low duodenal bicarbonate is seen in duodenal ulcers, due to abnormal synthesis or release of. secretin. Smoking also reduces pancreatic bicarbonate secretion and predisposes to ulcer.

Autodigestion in normal subjects is prevented by the presence of some intrinsic factor. It is assumed that structural abnormalities in the intrinsic factor predispose to ulceration. Abnormalities of sialic acid content have been reported (Fisher. 1983).

A very poor colateral circulation exists in the duodenal bulb and lesser curvature of the stomach and that is why these areas are more prone to ulceration. Micro occlusion of the blood vessels also predisposes to ulcer.

Salicylates, corticosteroids and other anti inflammatory drugs produce erosions or ulceration. Prostaglandin inhibition is a common mechanism of mucosal damage by drugs. Genetic factors (Rotter and Rimoin, 1977) and blood group 0 in few cases also predispose to peptic ulcer disease.

Psychovisceral malformation in few cases leads to ulcer but psychological factors alone are less likely to produce ulcer. Increased incidence of peptic ulcer disease occurs in autoimmune diseases like Rheumatoid arthritis and Crohn’s disease (Fisher, 1983).

Diffuse pain, in the mid epigastrium is the major symptom (Earlam and Chir, 1976). Duodenal ulcer pain is mostly felt on the right and gastric ulcer on the left of mid line. It is typically growing, dullache,

or burning in nature. Radiation to lowerback, right or left of abdomen suggests pancreatic, gall bladder or splenic involvement. Severity of pain is related to the size and depth of ulcer. Pain becomes intractable during perfocation. G.I. bleeding reduces the pain due to the buffering of acid by blood. Duodenal ulcer pain occurs some time after the ingestion of meals and either subsides spontaneously or may continue till the next meal. Interval between the ingestion of meal and the onset of pain is short in gastric ulcer. Peptic ulcers usually heal in 6-8 weeks, but recurrence is a rule and about 80% r cur within a year of healing, usually during spring and autumn seasons. Symptoms in most cases subsides within few days of the initiation of the therapy. If relief does not occur, complication should be considered.

Upper G.I. series still remains the procedure of choice (Dodd and Nelson, 1961; Rogers et al., 1976). Angiographic diagnosis of the bleeding site should be done in acute bleeders. In 80% cases single contrast radiograph can differentiate benign from malignant ulcer, double contrast techniques will further increase the yields.

In 98% cases biopsy and brush cytology together during endoscopy can differentiate benign from malignant ulcer (Dodd and Nelson, 1961; Rogers et a!., 1976). Gastric analysis is seldom done these days. It is used to detect absolute achiorhydria in gastric malignancy, pernicious anaemia and atrophic gastritis.

The different agents used to heal ulcer can be broadly divided into 3 groups (Grossman et al.. 1981; Samloff, 1981). Those which (a) neutralize acid, (b) diminish pepsin activity, (c) protect mucosa from peptic proteolysis.

Although antacids are me most efficient means of neutralizing acid but all antacids are not alike. Much depends upon the acid neutralizing capacity, magnesium-aluminium ratio, sodium potassium and calcium content and of course the taste and cost. Most antacids empty rapidly from the fasting stomach and ideally they should be given one and three hours after meals. The aluminium and magnesium content of antacids disrupt the bowel habits, absorption of tetracycline is also impaired during antacid therapy.

In 1968 Black nd colleagues discovered the H2 receptor antagonists which include burimamide, metiamide and cimetidine. Burirnamide is weak when given orally. Metiamicle causes bone marrow suppression and fatal aplastic anaemia. Cimetidine is potent orally and intervenously. It decreases the acid secretion for almost four hours. Side effects of cimetidine are rare.

Anticholenergics are potent in inhibiting basal gastric acid secretion, but meal induced acid secretion is reduced only by 30-40%. Side effects of anticholenergics include blurred vision, dry mcuth retention of urine, constipation and glucoma exacerbation. Prostaglandins are also potent inhibitors of acid secretion but their side effects on cardiovascular and gastro-intestinal system are problematic.

Suiphated polysaccharides were used to inhibit pepsin activity. In U.S.A. they failed to show any efficacy, while in Japan they produced colitis and coagulation defects in test animals. However by decreasing the degree of polymerization, the side effect were reduced but antipeptic activity increased.

Sucralfate (Carafate) an aluminium salt of sucrose sulphate has a dual action. Firstly it binds to the ulcer crater by binding with albumin, fibrmogen and globulin and thus protects the ulcer. Secondly it adsorb pepsin. It also binds some bile salts and thus reduces the penetration of the acid in the mucosa. Healing rates of duodenal ulcer with this agent varies from 71-100% and thus the efficacy is similar to cimetidine.

Bismith containing preparations are reported to coat the gastric mucosa, but they are bad to taste, cause pigmentation of the tongue and turn the stools black. Carbenoxolone increases the quality and the quantity of mucus, inhibits pepsin and increases the mucosal secretions of bicarbonates, but its use is limited because of its mineralocorticoid like side effects as hypokalemia, hypertension, oedema and myopathy.

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