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Seminar on Acid Peptic Disease

Organized by the Deptt. of Gastroenterology Shaikh Zayad Postgraduate Medical Institute April 6, 1989.

INTRODUCTION

Acid Peptic disease is one of the most prevalent disease in Gastroenterology, therfore, a seminar, covering in detail, its many important facets was well deserved.

Last two decades have observed a phenominal change in the concept of its pathophysiology, approach to the diagnosis by the latest fiberoptic armamentarium and most importantly the development of new drugs, have offered rewarding panacea in most cases.

when medical therapy fails, a timely surgical intervention is in order. Thus: appropriately covered in this seminar. An elaborate guest and the local faculty have covered the subject well.

Pathogensis of Acid Peptic Disease

Professor Khawaja Sadiq:

Pathogenesis of a disease determines the treatment. There are certain contributory factors which can lead to acid peptic disease like hereditary, sex, stress, cigarette smoking, drugs and diet.

Hereditary; It is seen that relatives of doudenal ulcer patients usually suffer from duodenal ulcer and same happens in relatives of patients with gastric ulcer. In people with blood group "O" there is greater tendency for duodenal ulcer. Non- secretors of ABO blood group antigens in gastric juice have greater tendency for peptic ulcer.

Sex

Males have increased incidence of duodenal ulcer than females.

Stress

It is very important factor. It acts by increasing vagal tone.

Cigarette Smoking

It predisposes to peptic ulcer, by reducing bicarbonate secretion, rapid emptying of the stomach into the duodenum increasing the acid load, decreasing mucosal blood flow and decreasing synthesis of local prostaglandins.

Drugs

Non Steroidal Anti inflammatory drugs (NSAID) are ulcerogenic.

Diet

There is no definite proof that any particular diet causes ulcer. Milk was used as treatment in older times Intragastric milk drips were given and patient usually had relief symptomatically. The fact is that milk due to its calcium content gives rise to an increase rebound acidity so it is not chosen as a form of treatment. Milk does give immediate relief due to its prostaglandin contents apart from dilution of gastric contents.

Factors affecting the mucosal integrity are:-

i. Aggressive factors
ii. Defensive factors

Aggressive factors, like excessive acid production are known for a long time and there is an old dictum "no acid no ulcer". But defensive factors were ignored for a long time. Acid production is mediated by the Vagus Nerve. Parietal cells have three types of receptors

1. Gastrin receptors.
2. Muscarinic receptors.
3. H_2 receptors.

The vagus N. mediates through all three receptors, although gastrin and H_2 receptors have direct effect as well. Series of changes occur when these receptors are stimulated. Cyclic AMP and Ca^{++} ions with the help of ATPase, take luminal K^+ into the cell and H^+ ion is extruded into the lumen. This is called proton pump.

In duodenal ulcer patients about 30%, have hypersecretion of acid. There are different rates of hypersecretion in different areas of the world. In the U.S.A. it is 20%, in Scottland it is 50% and in India, it is 30-35%. Basal acid output (BAO) and Maximal acid output (MAO) both are high in duodenal ulcer and maximum acid output lasts for a longer period.

In hypersecretors there is greater parietal cell mass. Normal parietal cell mass is one billion but it is 1.9 billion in hypersecretors. Gastric acid production in

normal persons is 22 Meq/Hr while in hypersecretors it is 42 Meq/Hr.

There is also excessive stimulus for acid production like in Zollinger Ellison syndrome, G-cell hyperplasia or in systemic mastocytosis in which there is excessive histamine secretion by mast cells. Excessive stimulus in stress increases gastric output by increasing vagal tone.

Excessive pepsin production; In condition of pepsinogenemia there is increased pepsinogen - I in which there is 8 times higher tendency for duodenal ulcer than others. Pepsin has a role in acid production.

Defensive Factors

1. **Mucus:** Layer of mucus lines the whole of the G.I. tract, more so in the stomach.
2. Bicarbonate Secretion.
3. Mucosal blood supply.

Mucus acts as cytoprotective layer, retain bicarbonate secreted by mucosa and prevents stomach and duodenum to come in contact with high acid in lumen. pH in lumen is less than 3 and just adjacent to cells is more than 7. This gradient in the pH on either side is the function of mucus layer.

Bicarbonate Originates From Two Sources:

1. Duodenal Mucosa; Small amount of bicarbonate is secreted by the duodenal mucosa. It counters any acid which comes in contact with the duodenal mucosa.
2. Pancreatic and Biliary Secretions; These cause mass neutralization of large volume of acid, which is present within the lumen.

Blood flow is also very important for the integrity of mucosa. Any factor which decreases the blood flow of mucosa will interfere with its integrity. Stress ulcer in patients with shock, CVA, myocardial infarction or brain tumour is due to compromised mucosal blood flow.

Prostaglandins

Prostaglandins improve blood supply and increase bicarbonate secretion.

Role of Campylobacter Pylori in Peptic Ulcer Disease

Campylobacter pylori is a spiral organism which inhabits antrum in patients with gastritis. It is associated with peptic ulcer diseae. They respond to antacids but patients usually have relapse. Relapse rate is low with bismuth which is bactericidal.

Peptic Ulcer Bleeding and its Management
Dr. Sibtul Hasnain

Leading Causes of Upper G.I. Bleeding in Pakistan.

OESOPHAGEAL VARICES:	46.0%
PEPTIC ULCER:	33.0%

MANAGEMENT OF UPPER G.I BLEEDING

1. Resuscitation
2. Early Diagnosis
3. Specific Measures

Resuscitation

Make sure that airway is patent and secure i.v. line with wide bore branula.Restore volume with crystalloids colloids or blood when available.

Assesment of blood loss

Postural hypotension/tachycardia means 20% of blood volume is lost. Systolic B.P < 100mm Hg means 30% of blood volume is lost.

Gastric Lavage

Its main value is to remove the clots and prepare the patient for endoscopy.

Early Diagnosis

Quick diagnosis is important as 10% of patients will die.

Early diagnosis is based on

a. Good history.
b. Physical examination.
c. Endoscopy.
e. Double contrast Barium study.
f. Arteriography.

In patients with upper G.I. bleed, it is important to ask the history about the drugs especially aspirin, steroids, NSAID and anticoagluants. In patients with H/O chronic liver disease it is not necessary that they bleed from esophageal varices, about one third of the group bleed from esophageal varices, about one third of the group bleed from duodenal ulcer which have strong association with chronic liver disease. History pertaining to chronic liver disease, therefore, cannot exclude the

possibility of peptic ulcer.

In bleeding diathesis it is worthwhile to examine the patient for signs of bleed from multiple sites. For this skin can be examined for purpura.

Endoscopy is the mainstay in early diagnosis of acid peptic disease. As clinical diagnosis is wrong in 50% of the cases so we have to depend on endoscopy.

Double contrast radiography is accurate in 40% of the cases of gastric ulcer and 60-80% of the cases of esophagitis. Endoscopy is accurate in diagnosis of 96% of the cases. There is high index of accuracy in endoscopy. A small percentage can be missed due to the presence of blood or food material in the stomach, unprepared patient or if ulcer is lying in unaccessible area like advanced second part of the duodenum.

In cases of upper G.I. bleed in 90% of the cases bleeding stops spontaneously. Endoscopy should be performed within 24 hours of bleeding. One of the reasons of negative endoscopy is due to delay in the endoscopy beyond 24 hours.

Emergency endoscopy should be performed to exclude varices as management is different in these cases. It should also be done in patients with continued bleeding or a patient just going for emergency surgery, a guide line for surgeon can be given about the bleeding site.

Risk of emergency endoscopy is aspiration pneumonia. These patients can not tolerate sedation so it should be avoided. After endoscopy the patient should be sent to proper unit for his management where staff should be trained for handling such patients.

Endoscopic Diagnosis Versus Final Diagnosis

Two thousand people when operated it was found out that duodenal ulcer diagnosed on endoscopy was 94.3% accurate and gastric ulcer, 91.7% accurate. Acuracy rate in endoscopy is fairly good.

Role of Angiography

Angiography may be used as a means of diagnosis and treatment. It localizes the site where endoscopy has failed. It can be used to stop bleeding where surgery is contraindicated. Management of bleeding patients depends upon sources of bleed, accurate diagnosis, amount of blood lost, associated diseases and experties available. Monitor pulse and BP of bleeding patients, orthostatic changes raise the suspecion of further bleeding. Signs of peripheral perfusion should be noted and urine output monitored.

ECG, Hb% and PCV should be done. Hemoglobin is not accurate assessment of blood loss because of intravascular haemoconcentration. Blood urea and creatinine should be checked for renal status. Urea is high in upper G.I bleed due to presence of nitrogenous compounds in the gut. But if urea and creatinine both are high they suggest renal failure. Patients need immediate blood transfusion if hypovolemia or massive bleeding is observed. Or if Hb% is in the range of 4-10 gm%.

Factors which can cause rebleeding are fluctuating blood pressure, uremia, use of gastrotoxic drugs or by touching bleeding points during endocopy.

Non specific measures like cold water lavage or adrenaline lavage might be helpful initially but there is no proven role of gastric lavage. It might worsen the bleeding causing stress ulcer.

Role of Antacids and H2 Receptor Blockers in Acute Bleeding

There is no appreciable difference between placebo and H_2 receptor blockers, as far as arrest of bleeding is concerned. Similarly there is no advantage of antacids when used alone. In one study improvement was seen, when H_2 receptor blockers and antacids were used in combination and gastric pH was raised above 7.

Antifibrinolytic therapy has been tried but did not prove to be of benefit.

Modern Trend to Stop Bleeding Directly by Physical Means

Laser Photocoagulation: It has good results but equipment is costly and not available all around and it needs experience.

Electrocoagulation: It has passed through evolution of monopolar to bipolar, then teflon coated probes. It can stop bleeding effectively. Adrenaline injection at the site of bleeding is a simple method. It will stop bleeding if injected locally at the site of bleeding. Adrenaline is passed through the liver without entering into the systemic circulation and metabolized there. It has no adverse effects on heart or blood pressure.

Local coagulants can also be used. Intra arterial embolization can be done. Intra arterial vasopressin can be injected which is helpful in gastric ulcer but not in case of duodenal ulcer in which there are big arcades of vessels and drug is not effective to control bleeding.

Prognosis of Bleeding Patients

Morality is adversely affected by age (if it is above

60 years) massive hematemesis, gastric ulcer and concomitant illness.

Atypical Gastroduodenal Ulcer and Its Medical Management
Dr. Zafar Iqbal:

Atypical peptic ulcer is drug induced like NSAID, certain chemicals, antimetabolites, histamine, caffeine, steroids and corrosive agents.

NSAID: They interfere with gastric mucosal barrier by causing reduction in local prostaglandins synthesis, so that the defensive mechanism is lost. These also decrease mucus formation and bicarbonate secretion and lead to decreased mucus turnover.

Potassium: Potassium is usually given to patients with cardiac failure along with diuretics. It is highly ulcerogenic. In one study salt of patassium was used. 2.4 gm caused acute gastic errosions in 80% of the cases and by the slow K in 40% of cases. One should be careful about the use of potassium.

Steroids: Most of the studies show that steroids do not cause ulcer. Most of the patients on steroids are also getting NSAID so these might be the cause of the ulcer.

Gastritis: It washes away the mucosa and ulcer is formed. It is much commoner than the ulcer of an acid peptic disease. It can be of type A or B.

Type A: It is more common in females and involves fundal area. Acid pepsin is normal in them. In 90% of cases parietal cell antibodies are present and 3% of cases with ulcer develop pernicious anemia.

Type B: Most common in Eastern Europe and Australia. It is usually due to the use of food preservatives like nitrates which are toxic to the gastric mucosa. These are also carcinogenic.

Corrosive Agents Corrosive agents like alkalies and acids can cause ulcers.

Tumours Tumours are also among common causes of atypical ulcer. These can be benign or malignant.

Surgery in Peptic Ulcer
Professor Mahmood Ahmad Chaudhry

One in ten patients might come for operation. 70% have good results end 30% still have problems and are unsatisfied.

Indications for Operation
1. Failed medical treatment.
2. Recurrent peptic ulcer formation.
3. Patient's choice.
4. Upon advice of endoscopist because ulcer is not healing and has undulent margins.

Surgical Emergencies
a. Bleeding peptic ulcer.
b. Perforated peptic ulcer.

Types of Operations
Gastroenterostomy: It is safe and simple procedure. Mortality rate is 25-30%. Usually stomal ulcers are formed at the site of junction. Now a days it is hardly used due to the problem of recurrence, except in old age group where acid production is lesser and surgeon wants to bypass the scarred area. It can be combined with other operations.

Gastrectomy

Distal 2/3 of the stomach is dissected. It gives excellent results but mortality rate is very high about 55% which is much high for a benign condition.
Drainage procedures are of two types:-

1. *Gastrojejunostomy*
2. *Pyloroplasty*: This is more physiological though technically more difficult to manage than gastrojejunostomy. Here pylorus is made incompetent. This is a procedure which has to be combined with vagotomy.

Antrectomy + Vagotomy: Done in patients who are labelled by endoscopist as having bad prognosis, as they have multiple ulcers. Here the neurogenic stimulus as well as the acid producing mucosa is removed. Technically it is a difficult operation.

Gastroenterostomy

As a sole procedure, it is useful in elderly patients as mortality and morbiditly are low but recurrence rate is as much as 40%, which is unacceptable.

Partial Gastrectomy

Two third of the distal stomach is removed and remaining part is anastomosed with the duodenum. This is successful in gastric ulcers.

Polya Gastrectomy

This is done where duodenum is very much scarred and partial gastrectomy is not feasable. Precautions are taken to avoid blind loop syndrome, hence afferent limb is kept as short as possible.

Truncal Vagotomy

In this operation both anterior and posterior vagi are cut in their abdominal course.

Selective Vagotomy

These procedures were introduced with the concept that only those vagal branches should be cut which supply the acid producing mucosa of the stomach and rest of the vagus should be preserved, thereby reducing post operative complications. However, practically there is no advantage and truncal vagotomy is performed. So the procedure of choice in acid peptic disease is truncal vagotomy with a drainage procedure where mortality is less than 2% and recurrence rate is 6-10%.

Surgery in Complications of Peptic Ulcer

1. Perforation:- (Duodenal)

It is best to operate in the first 12 hours. A thorough peritoneal toilet will reduce chances of subsequent adhesion formation. If there is much edema of the affected area, then simple closure should not be attempted and a rotated omental patch should be used.

Vagotomy should not be combined routinely except in those patients who were already evaluated for elective surgery. Here truncal vagotomy with a drainage procedure may be combined with repair of perforation.

2. Bleeding Peptic Ulcer: (Duodenal)

Surgery is usually required in older patients who have atherosclerosed vessels. Also recommended in those who are not controlled conservatively.

Any concomittent therapy e.g. anticoagulants should be discontinued and if bleeding can not be controlled, one should not wait and should pursue for emergency surgery. At surgery it may be required to locate gastroduodenal artery, put a stitch there and then do definitive repair.

3. Bleeding/Perforation of Gastric Ulcer

Only one treatment i.e. gastrectomy is the option. Here, morbidity and mortality is high and there is also definitive risk of malignancy.

Technique

Good exposure is important hence no scope of a small incision.

Good lighting and adequate traction are also important.

Complications of Surgery:
Early Comlications:

1. *Stomal Obstruction*
   May be due to edema or herniation of anastomosed loop of small intestine. This can be a bad complication managed initially by continued NG suction. However, if patient does not improve in 3-4 days then, reoperation and rectification of the problem is needed.

2. *Anastomotic Leak*
   This is due to faulty technique where either suture line is not competent or too much has been done resulting in avascular necrosis. These cases need to be reoperated.

3. *Internal Hernia*
   A rare complication, may need reexploration.

4. *Duodenal Hematoma*
   It can be avoided by gentle handling of the tissues and exclusion of bleeding diathesis preoperatively.

5. *Jejunal Ulceration:*
   Occurs in those cases of gastro jejunostomy where accompanying vagotomy is not complete and jejunal mucosa is exposed to gastric acid.

6. *Acute Pancreatitis:*
   This can result from rough handling.

Late Complications:

1. *Recurrent Ulcers*
   These can occur at or distal to the anastomotic site e.g. in pre pyloric area if acid production is not adequately abolished and there is stasis due to faulty drainage. These are managed initially by medical therapy but re-operation may be necessary.

2. *Diarrhoea*
   Usually it settles but in 10-30% of the cases it continues and becomes very troublesome for the patient. It can result in malnutrition.

3. *Gastritis*

In cases where pyloroplasty has been done biliary reflux can cause gastritis. Metoclopramide can be useful in such condition.

4. *Nutritional Deficiencies*
Various types of anemias e.g. iron deficiency or B_{12} deficiency can develop which should be diagnosed accurately and treated. Osteomalaeia and osteoporosis may be precipitated.

5. *Dumping Syndromes*
These are uncommon. They may be

a. Early - Due to VIP or hyperosmolar food bolus getting entry into the intestine and resulting in flushing and feeling of fulness.

b. Late - This is supposed to be duc to inappropriate rise in insulin post-prandially, resulting in faintness.

6. *Malignancy*
There is a definitive risk of developing carcinoma at the site of surgery. It is not clear whether it is duc to an already unstable mucosa or H_2 blockers havc any contribution to it.

Question/Answer

Q: How the completeness of vagotomy is verified?
A: If vagotomy is complete abdominal part of the esophagus should become freely mobile.

Peptic Oesophagitis

Dr. Anwaar A. Khan

Peptic Oesophagitis is defined as inflamation of the oesophagus as a result of reflux from the stomach. A large study was conducted at Michigan Univ. Hospital where it was found that 7% of house staff had symptoms of heartburn on daily basis and considered it normal. However, when they were questioned on monthly basis, 36% complained of heart- burn.

Pathogenesis

Antireflux Barrier

Most important factor is the pressure at the lower oesophageal sphincter. It is a physiological sphincter 2 cm below the diaphragm. Sphincter pressure is about 10 cm of water. It has been documented with sophisticated motility studies that those who have sphincter pressure less than 10 cm had symptoms of reflux and also oesophagitis.

Causes of Low Oesophageal Sphincter Pressure:

1. *Dietry Factors*
Alcohol, coffee, chocolate

2. *Smoking*
Lowering of LES pressure on smoking is documented on Barium studies.

Mucosal Resistance

Once mucosal resistance is overcome further damage is perpetuated. This has been shown in animal studies. This results in a vicious cycle which continue unless broken by medication.

Oesophageal Clearance

This is due to primary and secondary peristaltic waves. Primary peristalsis is triggered by swallowing. Secondary peristalsis continues untill esophagus is empty. It takes about 9 seconds for oesophagus to empty after swallowing liquids. If there is delayed clearance then mucosa is receptive to reflux damage. This has been documented in scleroderma and autonomic neuropathy e.g. Diabctes Mellitus.

Gastric Factors

Patients who have gastric ulcers have reduced in them gastric motility and reflux is increased. It has been documented that those who have esophagitis have reduced gastric motility. Whether this is mediated through vagi is not clear.

Barrett's Oesophagus

This is a severe form of oesophagitis where normal stratified squamous epithelium of the lower oesophagus is replaced by columnar epithelium. This can be diagnosed easily endoscopically when finger like projections of gastric mucosa can be seen at the lower end of the oesophagus. This metaplastic epitheluim produces acid and pepsin to which esophageal mucosa is sensitive. There is also risk of developing adencoarcinoma in the long run.

Investigations

History: Symptoms of reflux e.g. heart burn.
Ba Swallow: Not uncommonly will demonstrates reflux. However this is not a sensitive test. This demonstrates only gross abnormality of the lower oesophageal sphincter (LOS). Once reflux is documented phase I treatment is instituted which consists of:

1. Raising head end of the bed.
2. Advising small and more frequent meals. Dinner

should be taken 3-4 hrs before going to bed.

3. *Antacids:* All those available in the market have similar properties however there is evidence that those antacids which contain alginic acid have better results in reflux patients It forms a foam on the surface of gastric contents.
4. Weight reduction has a beneficial effect and improves LES pressure.

Acid perfusion Test

If the patients do not improve then this simple test can be done in which a nasogastric tube is passed into the mid oesophgus and about 50 ccs of 0.1 N HCI is instilled. Patients should have symptoms of heart burn. If so then normal saline is instilled and this should relieve the symptoms. If symptoms recur on reinstillation of HCL, then test is positive and is quite specific for reflux oesophagitis.

Endoscopy

Those patients who fail to improve should have endoscopy for the following reasons:

1. To see complications of reflux oesophagitis e.g. Barrett's Oesophagus or stricture formation.
2. To exclude any malignancy. However, endoscopy is not a sensitive test for the diagnosis of reflux esophagitis and it is not uncommon to see normal endoscopic appearence in the presence of oesphagitis.

pH Monitoring

This can be one time or 24 hours pH monitoring. These are becoming very popular. pH is monitored by very tiny catheters and recordings are made like holter monitor. If the pH is below 4 most of the time, this is consistent with reflux esophagitis.

Oesophageal Scintigraphy

This is a tubeless test well tolerated by the patient. It requires Gamma camera and can quantify the reflux.

Eophageal Manometry

Not a routine test, however, if the patient is not improving then this can be done if anti-reflux surgery is being considered. This shows whether the peristalsis is strong or weak. If weak, then a high anti reflux procedure can cause dysphagia and surgical technique has to be modified.

Phase II Treatment

The patients who do not respond to phase I treatment are put on phase II therapy. The drugs are:

a. Bethanecol.
b. Metoclopramide.

These improve the oesophageal as well as gastric emptying. They also increase LES pressure.

H_2 Receptor Blockers

They have been tried and produce improvement in symptoms, however, healing of ulcers is not as promising as was expected.

Metoclopramide

Its role has been studied in many placebo controlled studies lasting 4-8 weeks. In most of the studies its use produced marked symptomatic improvement and reduction in the dosage of antacid required. However, healing of ulcers was not affected.

Cimetidine

The studies have generally shown symptomatic improvement and reduction in antacid requirement. However, healing is not affected.

Bismuth

It has been studied in those patients who were given an adequate course of cimetidine and then bismuth was added to it. It was instilled into the esophagus. In one study, seven out of ten patients had healing of ulcers whereas the other three reverted from Grade IV to Grade I oesophagitis.

Anti Reflux Surgery

This is the last modality of treatment

Questions/Answers

Q: What are the indications of anti-relefux surgery?

A: Patients with Grade IV oesophagitis not responsing to phase I and II treatment, cimetidine and some of the newer drugs, should be recommended surgery. Patients who develop complications e.g. stricture should have surgery. In Barrett's esophagus where dysplastic changes are present on biopsy, should also have surgery.

Dr. Nusrat ullah chaudhry: Common Acid Peptic disorders a message for all.

Dr. Nasrut Ullah Ch. showed video recording of spectrum of interesting cases of acid peptic disease. His message for the residents and general practitoners was clear that early diagnosis of peptic ulcers prevents serious complications as the therapy is instituted early.