Peptic ulcer management in primary care by family physicians: Review

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Abstract:

In this review we discuss the physiopathology and etiology, to better understand this disease. We highlight the risk factor, scoring systems for peptic perforation and management method in primary care. We searched for articles published through 2017 in the following five electronic databases: PubMed, Science Direct, Embase, Web of Science, and Scopus, for both English and non-English language articles with the following keywords: “Peptic ulcer”, “management”, “primary care”, “family medicine. Peptic ulcer is a disease of chronic development, characterized by an inequality between the elements that harms the mucosa and those for its security, resulting in a lesion of the lining of the upper digestive tract. It has been among the most prevalent diseases worldwide, and a few of its difficulties have been the major causes of morbidity and mortality. In a location where general practitioners are the first contact for the patients a substantial reduction or judicious use of NSAID's will certainly

help in reducing gastro duodenal ulcers. Newer NO, H2S launching medications if presented would go a long way to decrease incidences of peptic disease and its complications. In proven situations of gastro duodenal ulcers on endoscopy use of three-way drug therapy for removal of H. pylori is mandatory. Boey score should be used to convey the prognosis of the patient. A well balanced diet is important in the treatment of peptic ulcer, once food could prevent, manage or even reduce the symptoms involving this pathology.

Introduction:

Peptic ulcer disease consists of both gastric and duodenal ulcers which postured a significant danger to the globe's populace over the past 2 centuries with a high morbidity and death. The advancement of understanding pertaining to etiopathogenesis of peptic acid condition from acid-driven illness to a transmittable condition has opened this topic for numerous research studies to find the best possible alternatives for management of this disease [1].The exploration of Helicobacter pylori has evinced terrific interest in the role played by this microorganism. The eradication of this organism has been found to be of critical relevance to decrease the complications of peptic ulcers [2].

The management of peptic ulcer illness and its problems continue to be a challenge. In addition, non-steroidal anti-inflammatory medications (NSAIDs), low-dose aspirin, smoking cigarettes,

excessive alcohol usage, psychological stress and anxiety and psychosocial variables are progressively essential causes of ulcers and their difficulties also in H. pylori-negative patients. Various other unusual reasons for peptic ulcer illness in the absence of H. pylori, NSAIDs, and aspirin additionally exist [3].

Epidemiological research studies expose an extremely strong organization between H. pylori infection and peptic ulcer illness. Over half the globe's populace has a chronic H. pylori infection of the gastroduodenal mucosa, yet just 5-10% establishes abscess [4].Factors that figure out whether the infection will generate the illness depends upon the pattern of histological modifications, gastritis caused changes in homeostasis of gastric hormones and acid secretion, gastric metaplasia in the duodenum, interaction of H. pylori with the mucosal obstacle, immunopathogenesis, ulcerogenic pressures, and hereditary factors.

Management of peptic acid condition differs from making use of H2 receptor antagonist, proton pump inhibitors (PPI) to three-way chemotherapy and consecutive routine for H. pylori. Similarly treating perforation varies from a traditional non operative strategy to a surgical method [5].

In this review we discuss the physiopathology and etiology, to better understand this disease. We highlight the risk factor, scoring systems for peptic perforation and management method in primary care.

Methodology:

We searched for articles published through 2017 in the following five electronic databases:

PubMed, Science Direct, Embase, Web of Science, and Scopus, for both English and non-

English language articles with the following keywords: “Peptic ulcer”, “management”, “primary care”, “family medicine. Study designs that were included were randomized controlled trials (RCTs), case-control studies, cohort studies, prospective and retrospective uncontrolled studies, cross-sectional studies, and review studies. Case reports and case series were excluded. We searched bibliographies for all retrieved and relevant publications to identify other studies.

Discussion:

- **Physiopathology and etiology**

Peptic ulcer is defined by an option of continuity the top gastrointestinal system mucosa exposed to chloride peptic secretion. It typically takes place in the duodenum (5-10% of the populace), stomach or esophagus [6].It is a chronic condition, with activation and remission periods and its pathogenesis is characterized by the discrepancy in between the factors that harms the mucosa (chloride acid, pepsin, and ulcerogenic drugs) and those that secure it (mucosal barrier, prostaglandins, and mucosal secretion) [8].Clinical symptoms are defined by epigastric pain, shedding or severe and continuous discomfort, which has the tendency to be worse during the night. Pain generally takes place one to 3 hrs after eating, and may be complied with by

queasiness, vomiting, discomfort in the stomach tract, windiness, and considerable loss of body weight [7].

Crucial consider the etiopathogenesis are cigarette, alcohol, and Helicobacter pylori, which is able to move in high viscosity tool, adhering to the mucosa epithelium, where it continues to be secured [8].Medical diagnosis of this infection could be attained with different examinations, each with a level of sensitivity and specificity over 80%. The golden common examination is the top endoscopy, which allows the doctor to gather material to check for the presence of H. pylori besides other healing treatments [6].

- **Immunopathology of peptic ulcer**

The feedback to H. pylori infection is moderated by release of microbial lipopolysaccharide which carries out an acute adhered to by chronic immune reaction. At first there is a polymorphonuclear infiltration which along with bacterial products promote the manufacturing of IL 8 whose production is stimulated by tumor death factor alpha (TNF-α) and IL-1 launched by macrophages in action to microbial lipopolysaccharide.The acute and chronic response is promoted by T-helper cells. Th1 cells that promote swelling and by activating Cluster of differentiation 8+ T cells bring about autoantibody formation and cell-mediated epithelial damage. Constant secretion of IL 8 due to chronicity of infection brings about mucosal damages and raised complimentary radical development. LT are conciliators for mucosal damage particularly in alcohol induced ulcers where LT B4 is understood to be a powerful vasoconstrictor that induces mucosal anemia. Cytokines [9] play a vital role in law of mucosal immune system. Swelling of gastroduodenal mucosa causes release of IL 1β, IL 2, IL 6, IL 8 and

TNF that harms mucosal tissue. The degrees of IL 1β are elevated in H. pylori infection which causes inhibition of gastric acid and pepsinogen secretion.

- **Risk Factors**

The significant danger factors for PUD are credited to H pylori infection and NSAID or ASA use.Causes of non-H- pylori non-NSAID ulcers are the use of antiplatelet agents, anxiety, Helicobacter heilmanii, cytomegalovirus infections, Behcet condition, Zollinger Ellison disorder, Crohn condition, and cirrhosis with portal hypertension. Various other threat factors include older age and ethnic background (Table 1). H pylori, a gram-negative spiral bacteria, is transmitted via fecal-- oral, oral-- oral, iatrogenic or from mother-to-child paths. Danger factors for H pylori infection reveal geographical variant, with birth in developing countries and lower socioeconomic condition being highly common [10].Although a causal relationship with PUD is usually approved, it is approximated that H pylori-positive subjects have a 10% to 20% lifetime risk of developing PUD [1].This suggests feasible, yet unknown, cofactors responsible for ulcer formation.

Table 1. Etiology and risk factors for peptic ulcer disease.

Nonsteroidal anti-inflammatory drugs	Helicobacter pylori
Chronic obstructive pulmonary disease	Chronic renal insufficiency
Current tobacco use	Former tobacco use
Three or more doctor visits in a year	Coronary heart disease
Former alcohol use	Obesity
Diabetes	

- **Scoring systems for peptic perforation**

As peptic perforation is harmful, various scoring systems [11], [12] have evolved to prognosticate death and morbidity. Some systems take pre-operative condition right into account whereas others take the laboratory parameters and intra-operative findings into account for racking up. We

feel the Boey's scoring system still stands the test of time and assess the problem of the patient rather properly. The MPI, APACHE II, Hacetteppe systems include comprehensive parameters to be explored to arrive at a score.

In our opinion the scoring system should be simple and need to optimally predict the outcome on admission itself taking only clinical criteria into account to ensure that a opinion can be provided to the patient's relatives about the diagnosis which would ease any doubts.

Concurrent medical illness, pre-operative shock, and longstanding perforations (more than 24 h) are considered in Boeys score (Table 2).

Table2. Boey's score

Risk factors	No. of risk factor
None of below	0
Pre-operative Blood Pressure<100 mm Hg	1
Delayed presentation	2
Major medical illness present	3

In a large series by Irvin, ratings based on the existence of shock, delayed presentation or concurrent medical disease can have predicted bulk of post-operative deaths in elderly subjects, and it was recommended that threat stratification and better caution in using conclusive operations for perforated abscess may cause a decrease in the high mortality rate in elderly subjects.

Similarly many authors have observed that likelihood of death could be predicted by the Boey rating whereas the APACHE II score was much better in anticipating morbidity. Considering the large number of parameters that need to be examined in APACHE rack up that might not be feasible in all established especially so in our backwoods Boey score still stands the test of time.

The summary of all scoring systems [13] lead us to think that delay in treatment, concurrent clinical disease and visibility of shock create a savage triad for death. As these requirements are satisfied by Boeys, score it seems to be relatively a measure of morbidity and mortality. [14], [15].For this reason the scoring system ought to be frequently utilized for prognostication.

- **Medical management of peptic ulcer**

The medical management of peptic disease was revolutionized by the development of H2 receptor antagonists like ranitidine with subsequent exploration of PPI i.e omeprazole and its more recent generations. It was then that H. pylori was identified and different elimination programs evolved. H. pylori eradication program consisted of the 3 drug regime. In order to avoid resistance to antibiotics a consecutive regime is being utilized in many countries.Selective COX 2 inhibitors were introduced to decrease NSAID caused ulcers. PPI creates the mainstay in NSAID caused ulcers. Misoprostol is much better compared to H2 receptor villain in preventing gastric ulcer. There are research tasks that are on to assess the choice for using safer analgesics based on the facility that addition of NO, H2S releasing moiety to anesthetics through [4-(nitrooxy)-Butyl-(FEW)-2-(6-methoxy-2-naphthyl) -propanoate] 3582, 2-(acetyloxy) benzoic acid3- [(nitrooxy) methyl] phenyl ester] -4016 particle removes peptic ulcer risk considerably. These are partially in animal and human tests [16], [17], [18].In our institute we recommend triple treatment to all patients with peptic ulcer and perforation as facilities for breath examination and H. pylori histology and society are not offered.

- **Management of perforated peptic ulcers**

Perforation management of gastroduodenal ulcers has had numerous opinions.Duodenal ulcers are the commonest ulcers to perforate as compared with gastric ulcers. Surgery forms the pillar of treating perforation. It can be done by laparoscopy or open laparotomy.

Conservative treatment known as the Taylor method [19] consists of Ryles tube aspiration, anti-biotics, intravenous fluids and nowadays H. pylori three-way treatment. Patients most likely to react to conventional therapy can be identified by performing a gastroduodenogram as defined by Donovan et al. [20] and show no leak. A randomized trial suggested that in patients with perforated peptic ulcer, a preliminary duration of conventional treatment with mindful observation could be safely permitted except in patients over 70 years old, because such a monitoring duration could avoid the requirement for emergency situation surgical procedure in more than 70 percent of patients [21].Nonetheless, this opinion will certainly not hold good in cases with long perforation-operation interval. Finally non personnel choice must be made in operatively unfit patients only.

The open repair entails the closure of perforation by Grahams spot or Cellan-Jones method. Here we would like to clarify that the former used a free omental graft and the latter pedicled omental graft. In our viewpoint a pedicled omentopexy is more effective as the patch stays viable for a longer period. In bigger openings which is defined as a perforation of greater than 3 cm in dimension jejunal serosal flaps or antrectomy are done. A great peritoneal lavage is additionally important. A drainpipe will certainly not minimize the occurrence of intra-abdominal fluid collections or abscesses [22]. Nevertheless, we would recommend use drains pipes as it lowers poisonous peritoneal collections that includes in early retrieval. Rat models have proved that omental grafts assisted abscess recovery and prevented ulcer reoccurrence because of the visibility of fibroblast development aspect and changing development element at the graft

website showing a considerable duty in healing due to higher anti-inflammatory, raised angiogenic task and boost in collagen synthesis activity [23].

The indicators for elective surgery during emergency laparotomy are still clouded. However, extremely discerning vagotomy has been advised in places where the instances present early without comorbid variables. The enhancement of a conclusive procedure such as Billroth I/II; vagotomy throughout the emergency situation surgical treatment is not required as it enhances operating time specifically so in country circumstance where discussion to institute is delayed invariably due to inadequate socioeconomic problems. In gastric openings [24] the alternatives available are primary closure with omental spot or including a clear-cut treatment in addition to closure. Suffice it to state that straightforward closure is connected with low death and morbidity rate. Resections ought to be restricted to large ulcers and in very early discussions [25]

Laparoscopic repair service has its own advantages and disadvantages. A laparoscopic treatment is a minimally invasive tool. Benefits of laparoscopic repair are reduced post-operative pain, minimal use of analgesics, minimized health center keep. In addition, a decrease in injury infections, ruptured abdomen and incisional hernia because of tiny marks is known. Drawbacks are a lengthy operating time, higher incidence of re-operations because of leakage at the repair work website and a greater occurrence of intra-abdominal collection additional to poor lavage and not the least calls for an expert [1].

A brand-new method, called "stamp" approach that uses a biodegradable patch made of lactide-glycolide-caprolacton to shut the perforation using an adhesive Glubran 2 constructed from n-butyl 2 cyanoacrylate 2-octil cyanoacrilate, which has been accepted for intracorporeal use is in a trial phase in rats which has motivating results [26].

Conclusion:

Peptic ulcer is a disease of chronic development, characterized by an inequality between the elements that harms the mucosa and those for its security, resulting in a lesion of the lining of the upper digestive tract. It has been among the most prevalent diseases worldwide, and a few of its difficulties have been the major causes of morbidity and mortality. In a location where general practitioners are the first contact for the patients a substantial reduction or judicious use of NSAID's will certainly help in reducing gastro duodenal ulcers. Newer NO, H2S launching medications if presented would go a long way to decrease incidences of peptic disease and its complications. In proven situations of gastro duodenal ulcers on endoscopy use of three-way drug therapy for removal of H. pylori is mandatory. Boey score should be used to convey the prognosis of the patient. A well balanced diet is important in the treatment of peptic ulcer, once food could prevent, manage or even reduce the symptoms involving this pathology.

Reference:

1. Kusters JG, van Vliet AH, Kuipers EJ. Pathogenesis of Helicobacter pylori Infection. Clinical Microbilology Reviews 2006;19(3):449–90.
2. Kitchens DH, Binkley CJ, Wallace DL, et al. Heficobacter pyfori infection in people who are intellectually and developmentally disabled: a review. Spec Care Dentist 2007;27(4):127–33.
3. Hooper L, Brown TJ, Elliott R, et al. The effectiveness of five strategies for the prevention of gastrointestinal toxicity induced by non-steroidal anti-inflammatory drugs: systematic review. BMJ 2004;329(7472):948.
4. Aro P, Storskrubb T, Ronkainen J, et al. Peptic ulcer disease in a general adult population: the Kalixanda study: a random population-based study. Am J Epidemiol 2006;163(11):1025–34.
5. Ramakrishnan K, Salinas RC. Peptic ulcer disease. Am Fam Physician 2007; 76(7):1005–12.
6. Toneto M, Oliveira F, Lopes MH. Evolução histórica da úlcera péptica: da etiologia ao tratamento. Scientia Medica. 2011;21:23–30.

7. Marotta K, Floch MH. Diet and nutrition in ulcer diases. Med. Clin North Am. 1993;77:88–17.
8. Nieto Y. Protocolo terapéutico de la úlcera péptica. Medicine. 2012;11:179–182.
9. Kaur A, Robin S, Sharma R. Peptic ulcer: A review on etiology and pathogenesis. Int Res J Pharm. 2012;3:2230–8407.
10. Makola D, Peura DA, Crowe SE. Helicobacter pylori infection and related gastrointestinal diseases. J Clin Gastroenterol 2007;41(6):548–58.
11. Mäkelä JT, Kiviniemi H, Ohtonen P, Laitinen SO. Factors that predict morbidity and mortality in patients with perforated peptic ulcers. Eur J Surg. 2002;168:446–51.
12. Boey J, Choi SK, Poon A, Alagaratnam TT. Risk stratification in perforated duodenal ulcers. A prospective validation of predictive factors. Ann Surg. 1987;205:22–6.
13. Svanes C, Salvesen H, Espehaug B, Søreide O, Svanes K. A multifactorial analysis of factors related to lethality after treatment of perforated gastroduodenal ulcer. 1935-1985. Ann Surg. 1989;209:418–23.
14. Lohsiriwat V, Prapasrivorakul S, Lohsiriwat D. Perforated peptic ulcer: Clinical presentation, surgical outcomes, and the accuracy of the Boey scoring system in predicting postoperative morbidity and mortality. World J Surg. 2009;33:80–5.
15. Boey J, Wong J, Ong GB. A prospective study of operative risk factors in perforated duodenal ulcers. Ann Surg. 1982;195:265–9.
16. Wallace JL. Prostaglandins, NSAIDs, and gastric mucosal protection: Why doesn't the stomach digest itself? Physiol Rev. 2008;88:1547–65.
17. Fiorucci S, Santucci L, Gresele P, Faccino RM, Del Soldato P, Morelli A. Gastrointestinal safety of NO-aspirin (NCX-4016) in healthy human volunteers: A proof of concept endoscopic study. Gastroenterology. 2003;124:600–7.
18. Hawkey CJ, Jones JI, Atherton CT, Skelly MM, Bebb JR, Fagerholm U, et al. Gastrointestinal safety of AZD3582, a cyclooxygenase inhibiting nitric oxide donator: Proof of concept study in humans. Gut. 2003;52:1537–42.
19. Dascalescu C, Andriescu L, Bulat C, Danila R, Dodu L, Acornicesei M, et al. Taylor's method: A therapeutic alternative for perforated gastroduodenal ulcer. Hepatogastroenterology. 2006;53:543–6.
20. Donovan AJ, Berne TV, Donovan JA. Perforated duodenal ulcer: An alternative therapeutic plan. Arch Surg. 1998;133:1166–71.
21. Crofts TJ, Park KG, Steele RJ, Chung SS, Li AK. A randomized trial of nonoperative treatment for perforated peptic ulcer. N Engl J Med. 1989;320:970–3.
22. Schein M. To drain or not to drain? The role of drainage in the contaminated and infected abdomen: An international and personal perspective. World J Surg. 2008;32:312–21.
23. Matoba Y, Katayama H, Ohami H. Evaluation of omental implantation for perforated gastric ulcer therapy: Findings in a rat model. J Gastroenterol. 1996;31:777–84.
24. Madiba TE, Nair R, Mulaudzi TV, Thomson SR. Perforated gastric ulcer – Reappraisal of surgical options. S Afr J Surg. 2005;43:58–60.

25. Turner WW, Jr, Thompson WM, Jr, Thal ER. Perforated gastric ulcers. A plea for management by simple closures. Arch Surg. 1988;123:960–4.
26. Bertleff MJ, Stegmann T, Liem RS, Kors G, Robinson PH, Nicolai JP, et al. Comparison of closure of gastric perforation ulcers with biodegradable lactide-glycolide-caprolactone or omental patches. JSLS. 2009;13:550–4.