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Trends on gastrointestinal bleeding and mortality: Where are we standing?

Ahmed Mahmoud El-Tawil

Abstract

Bleeding from the gastrointestinal tract and its management are associated with significant morbidity and mortality. The predisposing factors that led to the occurrence of these hemorrhagic instances are largely linked to the life style of the affected persons. Designing a new strategy aimed at educating the publics and improving their awareness of the problem could effectively help in eradicating this problem with no associated risks and in bringing the mortality rates down to almost zero.

INTRODUCTION

Gastrointestinal (GI) bleeding involves any bleeding in the GI tract from the mouth, oesophagus, stomach, small intestines, large intestines, to the anus. Upper GI bleeding has been estimated to account for up to 20,000 deaths annually in the United States (international records are not available). The overall incidence of acute upper GI haemorrhage has been estimated to be 50 to 100 per 100,000 persons per year. The trends of hospitalization for GI bleeding in the United States in 1998 and in 2006 have

TRENDS ON GASTROINTESTINAL BLEEDING AND MORTALITY

Upper GI bleeding involves bleeding from the mouth to the duodenum (common causes of upper GI bleeding are listed in Table 1). But lower GI bleeding involves bleeding from the small intestines to the anus and can be caused by haemorrhoids, cancer, polyps and colitis, among other causes (Table 2). Upper GI bleeding has been estimated to account for up to 20,000 deaths annually in the United States (international records are not available). The overall incidence of acute upper GI haemorrhage has been estimated to be 50 to 100 per 100,000 persons per year. The trends of hospitalization for GI bleeding in the United States in 1998 and in 2006 have
Table 1  Causes of acute upper gastrointestinal bleeding

| Common                     | Gastric ulcer     |
|----------------------------|-------------------|
| Duodenal ulcer             |                   |
| Esophageal varices         |                   |
| Mallory-Weiss tear         |                   |
| Less common                | Gastric erosive/gastropathy |
|                            | Esophagitis       |
|                            | Cameron lesions   |
|                            | Diliarutory lesion|
|                            | Telangiectasias   |
|                            | Portal hypertensive gastropathy |
|                            | Gastric antral vascular ectasia (watermelon stomach) |
|                            | Gastric varices   |
|                            | Neoplasms         |
| Rare                       | Esophageal ulcer  |
|                            | Erosive duodenitis|
|                            | Aortoenteric fistula|
|                            | Hemobilia         |
|                            | Pancreatic disease|
|                            | Crohn’s disease   |

Table 2  Causes of acute lower gastrointestinal bleeding

| Common                     | Colonic diverticula |
|----------------------------|---------------------|
|                            | Angioectasia        |
| Less common                | Colonic neoplasms (including post polypectomy bleeding) |
|                            | Inflammatory bowel disease |
|                            | Colitis             |
|                            | Ischemic            |
|                            | Radiation           |
|                            | Unspecified (infectious or non specific) |
|                            | Haemorrhoids        |
|                            | Small bowel source  |
|                            | Upper gastrointestinal source |
| Rare                       | Diliarutory lesion  |
|                            | Colonic ulcerations |
|                            | Rectal varices      |

been summarised in Table 3.

And the hospitals’ discharge rates of the admitted subjects for different causes of GI haemorrhage in 1998 and 2006 in the United States have also been listed (Table 4).

The incidence rate for upper GI bleeding appears to be, in general, decreasing (Table 3). This may be due to the prescription of proton pump inhibitors and the skilled efforts to eradicate *Helicobacter pylori* infections (Table 4). But, the risk of upper GI bleeding appears to be increasing in particular groups of patients, such as those with a history of oesophageal varices (Table 5).

Regarding bleeding from the lower GI tract, it appears that haemorrhage from rectum and anus and the incidences of diagnosis of occult blood in stool are increasing (Table 5).

When the total number of discharges for cases of GI bleeding was investigated per age of the discharged patient, it appeared that incidences of GI bleeding are increasing in certain subgroups. The incidences of GI haemorrhage was, for example, found increasing in those who were less than 20 years old (Table 3).

Oesophageal varices form less than 10% of the all causes of GI haemorrhages. However, patients with variceal haemorrhage have a mortality rate of at least 30% during their initial hospitalization, with a one year mortality rate approaches 60%[3]. Patients who have bled once from oesophageal varices have a 70% chance of rebleeding, and approximately one third of further bleeding episodes are fatal[3]. The risk of death is maximal during the first few days after the bleeding episode and decreases slowly over the first 6 wk. Oesophageal varices are present in approximately 40% of patients with cirrhosis and in as many as 60% of patients with cirrhosis and ascites[3]. In cirrhotic patients who do not have oesophageal varices at initial endoscopy, new varices will develop at a rate of approximately 5% per year. In patients with small varices at initial endoscopy, progression to large varices occurs at a rate of 10%-15% per year and is related chiefly to the degree of liver dysfunction[4]. On the other hand, improvement in liver function in patients with alcoholic liver disease who abstain from alcohol is associated with a decreased risk, and sometimes even disappearance of the varices[3]. It has been estimated that up to 25% of the patients with newly diagnosed varices would bleed within two years[5]. The risk of bleeding in patients with varices less than 5 mm in diameter is 7% by two years, and in patients with varices greater than 5 mm in diameter is 30% by two years[5]. Mortality rates in the setting of surgical intervention for acute variceal bleeding are high[5]. Associated abnormalities in the renal[7], pulmonary[7], cardiovascular[7], and immune systems in patients with oesophageal varices contribute to 20%-65% of mortality[7]. In Western countries, alcoholic and viral cirrhosis are the leading causes of portal hypertension and oesophageal varices. Thirty percent of patients with compensated cirrhosis and 60%-70% of patients with decompensate cirrhosis have gastrointestinal varices at presentation[8]. The de novo rate of development of oesophageal varices in patients with chronic liver diseases is approximately 8% per year for the first 2 years and 30% by the sixth year[8]. A recently published survey[8] on consumption of alcohol by teenagers in the North West of England revealed that almost 90% of the participant school children (aged 15 and 16) drink alcohol at least occasionally. Of those, 38.0% usually binge drink (5+ drinks in one session), 24.4% are frequent drinkers (drinking two or more times a week) and 49.8% drinks in public settings (such as bars, clubs, streets and parks). It is worth to note that excessive drinking by young people, for example, has seen a 20% rise in hospital admissions in England over the last five years. The number of people taken to Accident and Emergency with alcohol-related injuries has also doubled to 148 477 a year. Alcohol-related conditions such as liver disease have doubled in less than a decade, to 262 844 a year as well.

But in developing countries, hepatitis B is endemic in the Far East and Southeast Asia, particularly, as well as South America, North Africa, Egypt and other countries in the Middle East. Schistosomiasis is an important cause of portal hypertension in Egypt, Sudan and other African countries[8]. Those that have been affected with bilharzia, they almost have additional complications from hepato-
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| Table 3 Trends of hospitalization for gastrointestinal bleeding in the United States in 1996 and 2006 |
|--------------------------------------------------------------------------------------------------|
| **Total number of discharges per 100 000 persons** |
| **(principal diagnosis)** | **1998** | **2006** | **Percent changes (%)** |
| Upper | 96 | 82 | -14 |
| Lower | 43 | 44 | +2 |
| Unspecified | 50 | 56 | +11 |
| **Total number of discharges per 100 000 persons** |
| **(all diagnosis)** | **1998** | **2006** | **Percent changes (%)** |
| 23 | 25 | +8.6 |
| 55 | 59 | +6.1 |
| 139 | 140 | +0.6 |
| 399 | 396 | -0.9 |
| 1731 | 1596 | -7.8 |
| 4257 | 4375 | -18.4 |

| Table 4 Death rates for gastrointestinal bleeding inpatients |
|--------------------------------------------------------------------------------------------------|
| **1998** | **2006** | **Percentage change (%)** |
| Inpatient death number | 20 013 | 16 344 | -18 |
| Inpatient death number/100 000 | 7 | 5 | -26 |
| **Percentage change (%)** |
| By bleeding site | Upper | 3.5 | 2.7 | -22 |
| | Lower | 3.5 | 2.9 | -17 |
| | Unspecified | 5 | 3.6 | -28 |
| By sex | Male | 4 | 3 | -25 |
| | Female | 3.8 | 3 | -21 |
| By age (yr) | < 20 | - | - | - |
| | 20-29 | - | - | - |
| | 30-44 | 1.6 | 1.1 | -31 |
| | 45-64 | 2.7 | 2.2 | -19 |
| | > 85 | 4.1 | 3 | -27 |
| **Percentage change (%)** |
| Ascaris and widespread infection has been demonstrated throughout Europe, particularly, Romania, Hungry, Portugal and Turkey. When 312 children in the age group of 4-15 years were examined for different intestinal helminths in three schools located in rural areas in Kupwara, Kashmir, India, 222 of 312 (71.15%) tested positive for various intestinal helminths. The various helminth parasites included Ascaris lumbricoides, Trichuris trichura, Enterobius vermicularis and Taenia saginata. The highest frequency of 69.23% (216/312) was noted for Ascaris lumbricoides followed by Trichuris trichura 30.76% (96/312), Enterobius vermicularis 7.69% (24/312) and Taenia saginata 7.69% (24/312). Single infection was found in 33.65% (105/312) and mixed infection was seen in 37.5% (117/312) children. Again, Chandrasekhar MR and others in 2003 collected faecal samples from 1000 children below 6 years of age. Six hundred and eighty children (68.0%) were detected to have intestinal helminthic infection. The incidence of intestinal helminthiasis in urban group of children was 56.8% (284 out of 500 tested) while in rural group of children was 79.2% (396 out of 500 tested) both in rural and urban population Ascaris lumbricoides was the single predominant species, whereas a combination of A. lumbricoides and Trichuris trichura was common multiple infection. All cultures of faecal samples were positive for hook worm ova. In Pakistan, out of 200 children examined, 132 (66%) were found positive for various intestinal helminths infection. There were 6 different types of helminths found in the specimens examined.

It has become visible from the above review that the main causes for the occurrence of haemorrhage from the GI tract are strongly linked to the life style of the affected persons. Educating the public is thus expected to solve this problem. However, when the effect of health education in the control of bilharzias is assessed the results were disappointing. In 2001, Garba et al. carried out a survey on two groups of endemic villages in the Niger. In one group of villages, there were health educa-

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Hobermold

Table 5  Underlying conditions of gastrointestinal in 1998 and 2006 n (%)

| Underlying condition | 1998 | 2006 | Discharge percentage change (principal diagnosis) | 1998 | 2006 | Discharge percentage change (all diagnosis) |
|----------------------|------|------|-----------------------------------------------|------|------|-----------------------------------------------|
| Upper GI: oesophageal varices, ulcer, perforation and other haemorrhages | 33597 (31) | 35085 (6) | 52% and 38% after population adjustment | 84368 (8) | 103381 (9) | 25% and 11% after population adjustment |
| Gastric, duodenal ulcers, gastrointestinal ulcers or perforation | 75129 (31) | 131225 (24) | -16% and -24% after population adjustment | 215912 (20) | 179032 (16) | -17% and -25% after population adjustment |
| Gastritis or duodenitis and haemorrhage | 54310 (11) | 44104 (8) | -19% and -27% after population adjustment | 118333 (11) | 90635 (8) | -23% and -31% after population adjustment |
| Angioedema of stomach and duodenum with haemorrhage | 9237 (2) | 14679 (3) | 59% and 43% after population adjustment | 15061 (1) | 23032 (2) | 53% and 38% after population adjustment |
| Haematemesis | 16466 (3) | 21230 (4) | 29% and 16% after population adjustment | 58955 (6) | 72655 (6) | 25% and 11% after population adjustment |
| Perforation of the large intestine | 9117 (2) | 10066 (2) | 10% and -0.3% after population adjustment | 26200 (2) | 33246 (3) | 27% and 15% after population adjustment |
| Haemorrhage of rectum and anus | 12084 (2) | 21456 (4) | 78% and 60% after population adjustment | 52974 (5) | 85592 (7) | 56% and 41% after population adjustment |
| Diverticulosis and diverticulitis of the colon and haemorrhage | 80007 (16) | 83927 (15) | 5% and -5% after population adjustment | 101000 (10) | 104516 (9) | 3% and -7% after population adjustment |
| Diverticulosis and diverticulitis of the small intestine and haemorrhage | 15369 (3) | 16259 (3) | 6% and -5% after population adjustment | 26933 (3) | 27433 (2) | 2% and -8% after population adjustment |
| Unspecified GI bleeding (blood in stool) | 31044 (6) | 38284 (7) | 23% and 11% after population adjustment | 283440 (27) | 325053 (29) | 15% and 4% after population adjustment |
| Haemorrhage of GI tract (unspecified) | 104991 (21) | 129164 (24) | 23% and 11% after population adjustment | 283440 (27) | 325053 (29) | 15% and 4% after population adjustment |

GI: Gastrointestinal.

Table 6 Causes of occult gastrointestinal bleeding

| Mass lesions | Carcinoma (any site) | Large > 1.5 cm adenoma (any site) |
| Inflammatory lesions | Erosive oesophagitis ulcer (any site) | Cameron lesion | Erosive gastropathy | Celac sprue | Ulcerative colitis | Crohn's disease | Non specific colitis | Caecal ulcer |
| Vascular lesions | Angioedema (any site) | Portal hypertensive gastropathy (colopathy) | Gastric antral vascular ectasia | Hemangioma | Dieulatary lesion | Hockworm | Whipworm | Strongylodiosis | Ascaridosis | Tuberculous enterocolitis | Amoebiasis | Cytomegalo virus |

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