

Monthly and seasonal variations of acute upper gastrointestinal bleeding in Mosul

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Abstract

Previous studies have reported seasonal variations in the incidence of acute upper gastrointestinal bleeding especially so for peptic ulcer. There is no study focusing on this issue in our locality. The study aimed to assess whether monthly and seasonal climatic changes during the year have an influence on the incidence of bleeding from duodenal ulcer (DU) and erosive gastroduodenitis (EGD); both of which are major causes of bleeding in this region. This case-series study involved (416) patients presented with acute upper gastrointestinal bleeding at Al-Salam General Hospital in Mosul during the period from 1 April 2001 to 31 March 2011. All patients were subjected to endoscopic examination and causes of bleeding, and date of examination were documented. Monthly and seasonal evaluation of bleeding incidents were made and correlated with the major causes of bleeding. The main causes of bleeding were (EGD) and (DU) making 41.11% and 30.53% respectively. Duodenal ulcer bleeding showed significant monthly ($p=0.035$) and seasonal ($p=0.005$) fluctuations, peaked in November, during autumn, and the trough was in July and August during summer ($P=0.0004$). Bleeding due to (EGD) showed neither significant monthly ($p=0.117$) nor seasonal ($p=0.711$) variations. In this study (DU) bleeding showed clear seasonal fluctuation which is not detected in bleeding due to (EGD).

Key words: Season, upper gastrointestinal bleeding, duodenal ulcer, Erosive gastroduodenitis.

Introduction

Acute bleeding from the upper gastrointestinal tract is a common medical emergency that has a hospital mortality of approximately 10% (1). Numerous reports have shown that acute upper gastrointestinal bleeding (AUGIB) from peptic ulcer is influenced by climatic factors (2-8). Studies of the effect of seasons on bleeding incidence from causes other than peptic ulcer are scanty (9-11). Some reports have found that the incidence of (AUGIB) is not influenced by seasonal factors (12,13). Most of the studies have shown that the incidence of such bleeding is higher in cold seasons and lower in summer (10,14-17). Duodenal ulcer complications have been linked to seasonal variations in the frequency of helicobacter pylori infection and gastric acid output (18,19). It has been reported that duodenal ulcer activity and bleeding are both influenced by climatic changes with similar monthly fluctuations (20).

Mosul is situated at north of Iraq (a developing country with a subtropical

climate), and located at about 36° 32' N - 43° 10' E. Temperature range is 1.85°C-42.65°C, in winter (0°C-16°C) and in summer (27°C-47°C). Mean duration of sunshine hours during summer is 14 hours/day and during winter 10 hours/day.

The aim of this study is to assess whether climatic factors throughout the 12 months and 4 seasons of the year have an influence on the incidence of bleeding from (DU) and (EGD) which are the main causes of (AUGIB) in our locality. Anticipation of such variations in the incidence of (AUGIB) during the year might have a favorable impact on management of patients in primary medical care centers and hospitals. To our knowledge no similar study has been conducted in Mosul, and worldwide limited number of reports have correlated between (AUGIB) due to (EGD) and climatic factors.

Patients and methods

This study was conducted at the endoscopy unit of Al-Salam General Hospital in Mosul. Four hundred and

sixteen patients presented with haematemesis and or melaena were examined endoscopically during the period from 1 April 2001 to 31 March 2011. These patients were referred from inpatient or outpatient departments. Informed consent from the patients or their families was taken. Relevant information of all patients was registered on endoscopic examination form including date of examination and endoscopic findings. Endoscopic examination was done within 2-48 hours after the incident of bleeding. Diagnosis of each lesion was based on endoscopic criteria and biopsy was taken from suspicious lesions. The diagnosis of (EGD) was made by finding different grades and patterns of mucosal congestion and oedema involving the stomach and or the duodenum with different size erosions. Recent bleeding was confirmed through finding actively bleeding lesion, blood clot, vessel at ulcer base, and blood or coffee ground material inside the stomach. At times such signs were absent and any lesion seen was regarded as the culprit lesion. The 12 month of the year were

divided, according to the climate in Mosul, into four seasons as follows: winter (December-February), spring (March-May), summer (June-August), and autumn (September-November). Monthly and seasonal recording of bleeding incidents were made and differences in incidence were assessed.

Descriptive statistics were used to describe age and sex of the patients. Statistical analysis was done using Pearson's Chi-squares and p-values. Level of significance was set at 5%. Tables and figures were done by Microsoft office excel version 2007.

Results

Four hundred and sixteen patients were included during the study period. Two hundred and eighty nine patients were males (69.47%) and 127 patients (30.53%) females. Age range was 3-92 years with a mean of 44.4 years. Causes of (AUGIB) are listed in (table 1).

The main causes of (AUGIB) were (EGD) (171 patients) and (DU)

(127 Patients) with frequency of 41.11% and 30.53% respectively. The number of patients due to bleeding (DU) showed significant monthly fluctuations ($p=0.035$) with a major peak in November, a smaller peaks in March and October, and a major dip in July and August (figure 1).

Seasonal fluctuations of bleeding (DU) was also evident ($p=0.005$), peaked in autumn and dipped in summer ($p=0.0004$) (figure 2). The number of patients with (AUGIB) related to (EGD) showed no significant monthly fluctuation ($p=0.117$) despite peaking in June and dipping in August (figure 3). There was also no significant seasonal variation in bleeding related to (EGD) ($P=0.711$) (figure 4).

Discussion

A wide range of medical conditions exhibit seasonal fluctuations in their occurrence. Such variation has been reported in cardiac events, cerebrovascular diseases and venous thromboembolism (21,22,23). It is well known that peptic ulcer activity is influenced by seasonal factors. Numerous

reports have indicated also seasonal variation in the incidence of peptic ulcer bleeding(2-11). Most of the studies showed that the highest incidence of bleeding occurs in winter, autumn, and spring in varying sequence and lowest incidence in summer (2-11,24,25) . Concerning (DU) bleeding the result of this study was consistent with numerous similar studies in other parts of the world (2-11,15,17,20). The highest incidence occurred in cold months and seasons and lowest incidence in hot months and season. The peak was in November, during autumn, and the trough in July and August during summer. In Mosul November represents the start of cold months while July and August represent the hottest months of the year, temperature may reach up to 47°C. The reasons of such seasonal and monthly variations are not well known and are poorly understood, it seems that cold depresses mucosal defenses and may work with other risk factors that culminates in peptic ulcer activity and bleeding complication. Natelson showed that the mucosal damage to the duodenum of mice

increases when exposed to cold stress test (26). A study from Hong Kong concluded that gastric acidity is unlikely to be a major factor in winter peaking of (DU) frequency; the acid peaks did not coincide with the ulcer occurrence peaks (27). Savarino showed no parallel circannual fluctuation of (DU), gastric acidity and *H.pylori* infection (28). In the current study bleeding gastric ulcer (GU) was rare which may be ascribed to the lower incidence of (GU) in this area compared to the much commoner (DU), a larger sample of (GU) patients are needed to fulfill a reliable study. Only few reports indicated the effect of climatic factors on bleeding due to gastritis, duodenitis, and erosions; the studied samples were small and definite conclusion can not be made (9,10). In the present study monthly fluctuations in the incidence of bleeding due to (EGD) was not significant ($p=0.117$) despite a peak in June, and significant seasonal variation was also not shown ($p=0.711$). Unlike erosions with variable temporal course and different causes; peptic ulcer is a unique entity with a known aetiology, epidemiology and

chronic natural course, the effect of seasons on its activity and complications is more clear.

The effect of seasonality on the incidence of (AUGIB) due to other causes was not studied because of a limited number of patients. Larger cross sectional population-based studies need to be done to disclose the risk factors of such variations and to clarify the interaction between climate and biological events.

Conclusion

This hospital-based study in Mosul area showed that there is a significant climatic monthly and seasonal variations in the incidence of bleeding duodenal ulcer, being highest in autumn and lowest in summer while such variations are insignificant in bleeding associated with erosive gastroduodenitis.

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Table (1): Endoscopic findings in the 416 patients

Causes	Frequency	Percentage (%)
Erosive gastroduodenitis	171	41.11
DU	127	30.53
GU	6	1.44
Oesophagitis	36	8.65
Oesophageal varices	21	5.05
Tumors	10	2.4
Mallory-Weis tear	5	1.2
Vascular malformation	4	0.96
Bleeding source unidentified	7	1.68
Gastric polyp	1	0.24
Normal	28	6.73
Total	416	100

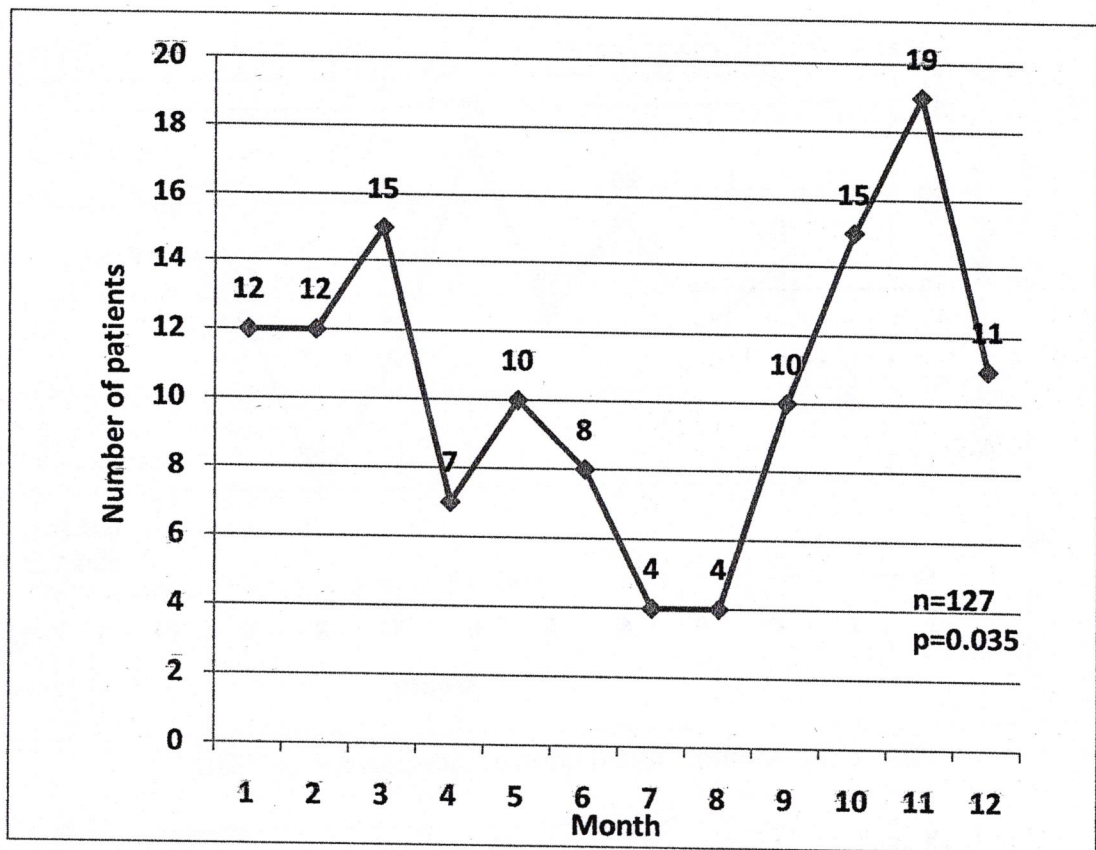


Figure (1): Monthly distribution of bleeding (DU)

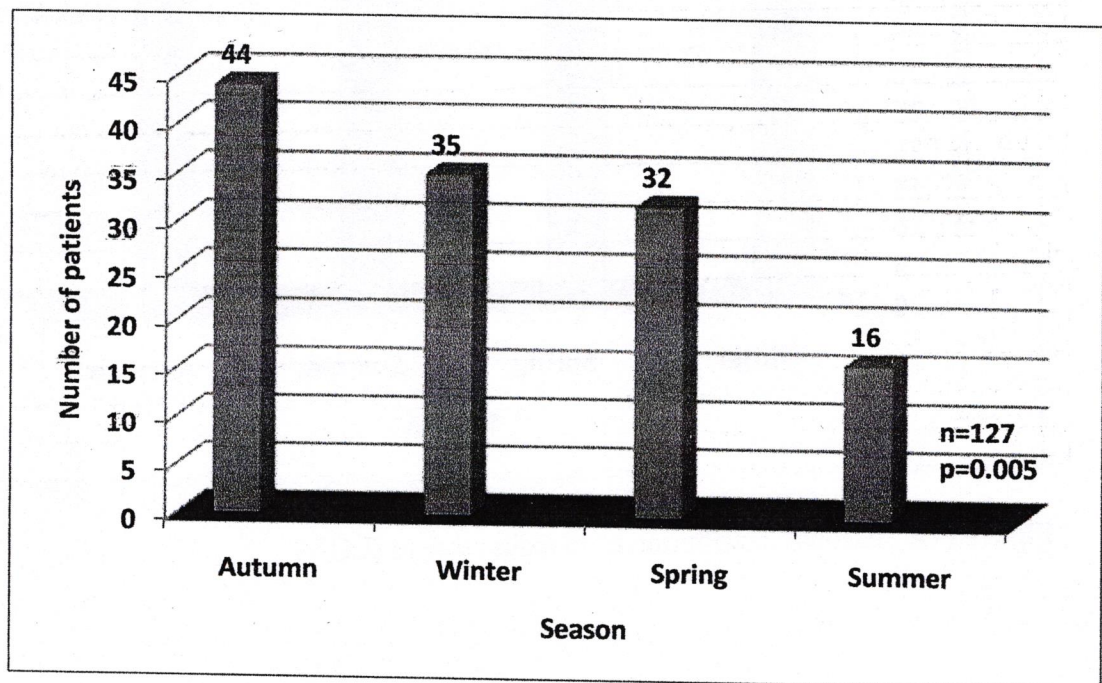


Figure (2): Seasonal distribution of bleeding (DU)

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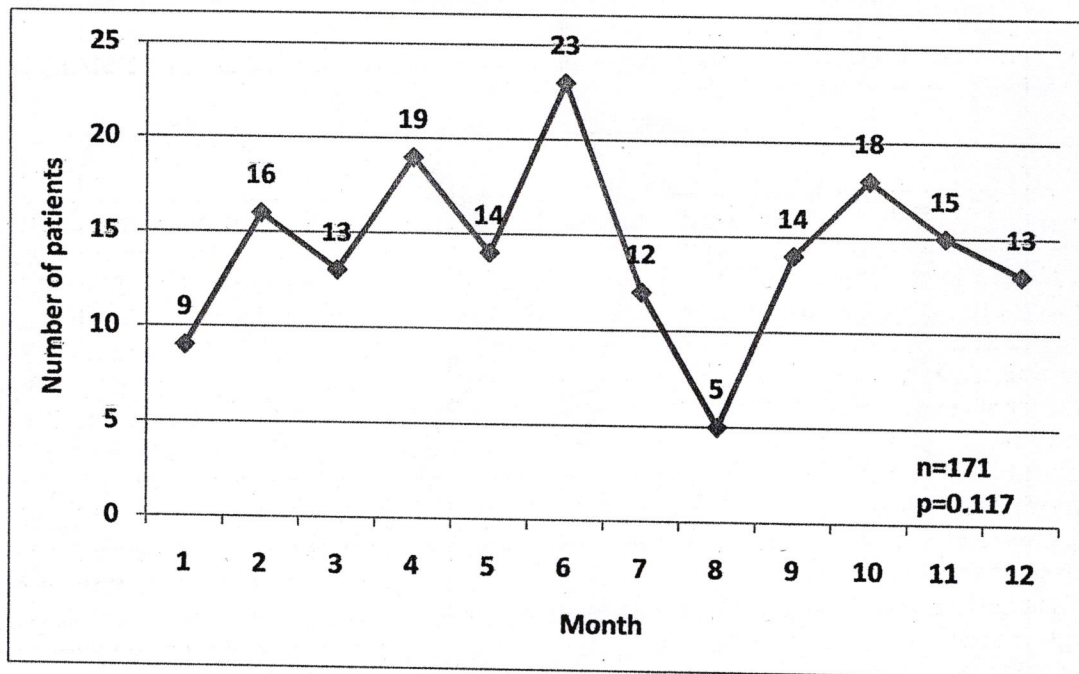


Figure (3): Monthly distribution of bleeding due to (EGD)

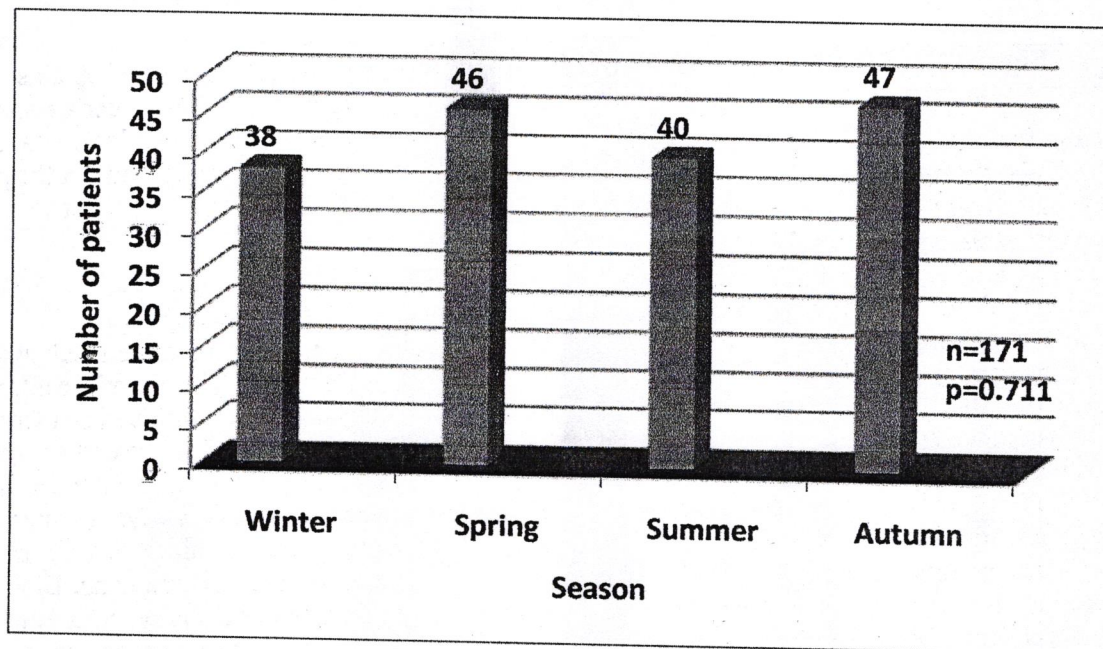


Figure (4): Seasonal distribution of bleeding due to (EGD)