UPPER GASTROINTESTINAL BLEEDING IN FATAL CASES WITH DIFFERENT CO-MORBIDITIES

Kleina Regina, Nazarovs Ju., Derovs A., Smits A.
1 Riga Stradins University, Department of Pathology, Riga, Latvia
2 Riga East Clinical University Hospital, Pathology Centre, Riga, Latvia
3 Riga Stradins University, Department of Internal diseases, Riga, Latvia
4 Riga East Clinical University Hospital, Gastroenterology, Hepatology and Nutrition clinic, Riga, Latvia

Summary

Background. Endoscopists, surgeons and gastroenterologists have emphasized the importance of bleeding from oesophageal variceal veins, stomach and duodenum peptic ulcers and malignancies of this region, but less attention has been paid to the role of gastric erosions. Upper gastrointestinal bleeding (UGIB) may happen not only due to primary pathologies of UGI organs but also in case of different concomitant non-oncological and oncological pathologies. Possibilities of autopsies are the detection of real cause of death and misdiagnosed cases with gastrointestinal bleeding.

Aim of the study. To analyse UGIB autopsy cases with different co-morbidities.

Methods. We have investigated 120 cases of death from UGIB during the period of 2013–2014. Clinical information and laboratory analyses were obtained from the hospital electronic database. Pathology protocols and histological specimens stained with haematoxylin-eosin were analyzed. Diameter, depth and the total area of erosions were evaluated. We focused as well on the site of death of the patient: whether it happened in hospital or outside it. Risk factors for UGIB were counted by Rockall numerical scoring system but Forrest scale was used for bleeding evaluation.

Results. Patients were divided into two groups: 1) the patients, who died of profuse bleeding in connection with the upper digestive organ pathology (n=84), 2) the patients with bleeding developed mostly from erosions as a different disease complication (n=36). The main causes of fatal bleeding of I group persons were: gastric ulcer –38.1%, duodenal ulcer –11.9%, oesophageal varices –30.9%. 28% of patients had such co-morbidities as: liver steatosis, different localization atherosclerosis and chronic forms of coronary heart disease, chronic pulmonary emphysema and nephrosclerosis. Rockall score was 4. Main illnesses of the II group of patients in case of secondary bleeding from gastric erosions were general atherosclerosis, cardiac pathologies with cardiac failure, chronic pulmonary diseases and non gastric malignancies. In contrast, the duodenal erosions were mostly found in chronic alcoholics with simultaneous pancreas and liver damage. Number of erosions in the stomach and duodenum ranged from 7 to 20. The average value of erosion diameter was 4.7 ± 1.3 mm. Rockall score was 8. Gastric and duodenal tissue tests confirmed the diagnosis of hemorrhagic erosive gastritis and duodenitis. The main diagnosis in this group of patients was correct in 84% of cases, but clinical information about gastric or duodenal bleeding was very insignificant. 100 ml to 1.5 litres of blood was found in the stomach in both groups of patients. 29% of all patients died at the stage before hospitalisation. 48% of the patients were in the hospital from a few hours to 1 day.

Conclusion. The improvement of the diagnostics of UGIB restricts delays in hospitalization, people low level of responsibility for their own health and insufficient information from family doctors about the patient background chronic diseases.

Keywords: upper gastrointestinal tract, bleeding, diagnostic errors, co-morbidities
Резюме

Введение. Причиной кровотечения из верхних отделов желудочно-кишечного тракта являются не только язва желудка, двенадцатиперстной кишки или варикозное расширение вен пищевода, но также и эрозии желудка. На клиническое течение болезни часто влияют сопутствующие заболевания, которые не всегда диагностируются при жизни пациента.

Цель исследования заключалась в анализе характера кровотечения из верхних отделов желудочно-кишечного тракта при различных сопутствующих заболеваниях.

Методы. Было исследовано 120 протоколов вскрытия и гистологических препаратов пациентов с кровотечениями из верхних отделов желудочно-кишечного тракта. Клиническая информация была получена из истории болезни и из электронной базы данных больницы. Мы учитывали умер ли пациент в больнице, в машине скорой помощи или скоропостижно умер дома. Рассматривалось также как долго пациент находился в больнице. Факторы риска желудочно-кишечного кровотечения оценивали используя Rockall систему, а для анализа динамики кровотечения использовали шкалу Forrest (1–3).

Результаты. Пациенты первой группы умерли от обильных кровотечений из-за патологии верхних отделов пищеварительного тракта. 28% из них были с сопутствующими хроническими сердечно-сосудистыми заболеваниями, с патологиями почек и злокачественными опухолями. Длительность пребывания в больнице менее 1 дня была обнаружена в 48% случаев. У 72,7% больных из первой группы диагноз при жизни не был установлен. У пациентов 2 группы кровотечение развилось из множественных эрозий, которые в документации были истолкованы как осложнение генерализованного атеросклероза (артерии и ее ветвей), хронических заболеваний печени, хронического алкоголизма, и не гастроинтестинальных опухолей. Количество эрозий в желудке колебалось от 7 до 20. Дефекты слизистой были в различных фазах формирования. Средний размер диаметра эрозий был 4,7 ± 1,3 мм. Уровень риска кровотечения соответствовал 8 или более баллам по шкале Rockall. Исследование тканей желудка и двенадцатиперстной кишки подтвердило геморрагический эрозивный гастрит и дуоденит. В 84% случаев основные заболевания были выявлены в стационарах, однако было мало информации о возможном кровотечении желудка или двенадцатиперстной кишки.

Выводы. Улучшение диагностики кровотечения из верхних отделов желудочно-кишечного тракта ограничивают поздняя госпитализация, низкий уровень ответственности за состояние своего здоровья и отсутствие информации от семейных врачей о хронических фоновых заболеваниях.

Экспериментальная и клиническая гастроэнтерология 2016; 128 (4): 24–29

Introduction

Upper gastrointestinal bleeding (UGIB) is permanently topical not only in gastroenterology, but also in internal medicine as a whole (1, 2, 3). Endoscopists, surgeons and gastroenterologists of various American and European countries have emphasized the importance of bleeding from oesophageal varicose veins, stomach and duodenum peptic ulcers and malignancies of this region, but less attention has been paid to the role of gastric erosion, especially in the recurrent version (4, 5). Upper GIB may happen not only due to primary pathologies of oesophagus, stomach and duodenum but also in case of different concomitant heart, lung, brain diseases and terminal malignancies (3, 6).

Comprehensive and population-wide studies on UGIB have been carried out in Europe and elsewhere (7, 8). Most studies have been carried out in university clinics during the patients’ lifetime; however UGIB cases have not been analyzed equally often, using information on causes of death from the death certificates (9, 10). In turn, studies based on pathology department records and histology of UGIB are rare and have been carried out earlier (11, 12). The opinion of a pathologist is important not only for diagnostic biopsy, but often also in the evaluation of autopsy findings, whereas hospital autopsies are decreasing in amount in most of countries including Latvia (13). Other possibilities of autopsies are the detection of misdiagnosed cases with gastrointestinal bleeding. From literature sources it is widely known that in general medicine the rate of discrepancies between clinical and autopsy diagnosis is 7–25% of the cases (14, 15).

Medical Statistics of Latvia specifies that the number of deaths caused by diseases of the digestive system is 50 per 100000 inhabitants. Around 430 persons per 1 million of population die from peptic ulcer annually. Pathologies of gastrointestinal organs as the reason of death in our country rank fourth, leaving behind cardiovascular diseases, malignancies and different accidents.

There are relatively few publications on bleeding from the upper digestive tract organs in the Baltic States, and they are more likely to be published in local journals (12, 16, 17).

We believe it is important to stress that the development of complications, including bleeding in gastrointestinal diseases is affected not only by various co-morbidities, addictions, but also by the patients’ co-responsibility for their illness, especially by how timely the patient seeks medical assistance.
Materials and Methods

We have investigated 120 cases of death from UGIB during the period of 2013–2014 at Riga East Clinical University Hospital. Autopsies of the patients were performed at the Pathology Centre of the same hospital. Pathology protocols and histological specimens stained with haematoxylin-eosin were analyzed. The diameter of erosions was measured by usual ruler during autopsy, whereas the depth of erosion was evaluated only under microscope with ocular ruler of Axiomat Star microscope. We calculated the total area of all erosions and expressed in mm².

Clinical information and laboratory analyses were obtained from the hospital electronic database (Doctor’s Bureau of RECUH). The main diagnosis, complications and concomitant diseases from pathology records were taken into consideration. We focused as well as on the site of death of the patient: whether it happened in hospital or outside it. Age and gender were evaluated too. Risk factors for GIB were counted by Rockall numerical scoring system (18). Forrest scale was used for bleeding evaluation (19). Statistical analysis was conducting using the software Statistica 12.0. Continuous variables are presented as mean±SD (standard deviation of the mean), and categorical variables are presented as percentages (%).

Results

Patients were divided into two groups:
1. the patients, who died of profuse bleeding in connection with the upper digestive organ pathology, and
2. the patients with bleeding developed mostly from erosions as a different disease complication, where it significantly worsened the clinical course, in part of the cases this was also the death reason.

Characteristics of the I group of patients

The main causes of fatal profuse bleeding were from: gastric ulcer –38.1%, duodenal ulcer –11.9%, oesophageal varices –30.9% (Figure 1). 29% of the patients died at the stage before hospitalisation. This happened in the patients’ homes, in the ambulance or a few minutes after the admission to hospital.

For hospitalized patients, in 30% of the cases gastric and duodenal ulcers were treated surgically, the rest — conservatively. Surgical treatment took the form of stomach resection according to Billroth II and suturing of the ulcer. There were no data on artery embolization in medical documentation. Patient hospitalisation in cases of ulcer disease was delayed and the patients were in the hospital until exitus letalis from a few hours to 1 day (Figure 2). This period is often too short for making of a correct diagnosis and initiating of appropriate treatment.

According to the autopsy protocols in all cases from 100 ml to 1.5 litres of blood were found in the stomach, which indicates rebleeding (Figure 3). Stomach ulcers ranged from 8 mm to 4 cm in diameter but from 50.24 mm² to 1256 mm² in area (with the average 200.96±30.1 mm²). The duodenal ulcers ranged from 8 mm to 2 cm in diameter but from 50.24 mm² to 314 mm² in area (with the average 113.04±15.6 mm²). From the data of clinical epicrises it may be concluded that many patients already had anaemia on admission with an average haemoglobin index 7.17 ± 1.9 g/dl (it ranged from 3.1g/dl to 15.1g/dl).

The average age of patients in Latvia with gastric and duodenal ulcers decreases in dynamics over the years. Whereas in our previous study in 2005 it constituted 74.2 years, for the period of 2013 to 2014 it was 64.1 years, including the average age in men of 60.5 years.

Characteristics of the II group of patients

In this group the patients were included, for which during autopsy bleeding from multiple erosions in the stomach (n=29) and the duodenum (n=7) was found. The average age of these patients was 69±5.23.

Fatal ulcer disease cases happened more often in the autumn and winter periods from November to February. In addition in the bleeding ulcer disease fatalities we have analyzed the second most common complication was peptic ulcer perforation with peritonitis (29%).

Comparing the clinical diagnosis with the conclusions of the pathologists, we found that for 27.2% of the patients, who died in hospital, the diagnosis were not determined during their lifetime. Differential diagnosis made by the doctors from surgical and gastroenterological, as well as general profile therapy care units were: hollow organ perforation, post haemorrhagic anaemia, various forms of coronary heart disease and variable localization malignancies. For the determining of correct diagnosis for upper gastrointestinal bleeding cases such clinical or laboratory findings such as abdominal pain, melaena, accelerated ESR with the average of 50±7.3 mm/h, fever, leukocytosis, and the already mentioned low level of haemoglobin in the blood were not assessed.

It is important to note that in the analyzed group of patients with profuse upper gastrointestinal haemorrhage, 28% of patients had a number of co-morbidities. From the point of view of the digestive system in one third of the patients it was liver steatosis, which in part of the patients in accordance with the entries in the medical documentation had developed on the background of chronic alcoholism. From the point of view of other systems the underlying conditions of different localization atherosclerosis and chronic forms of coronary heart disease were prevailing (68%). For this group of patients in autopsy protocols of 45% of the cases chronic pulmonary emphysema and in 35% of the cases nephrosclerosis was mentioned as well.

These erosions or hemorrhagic erosive gastritis were assessed in the documentation of the pathology department as another serious complication of the main disease.
Number of erosions in the stomach ranged from 7 to 20 and was localized diffusely throughout the gastric mucosa. According to Forrest classification they corresponded to the I and II class. Mucosa defects were at different stages of their development, but always at their base hydrochloric haematin were diagnosed. Erosion diameter was within 3–6 mm with an average value of 4.7 ± 1.3 mm. The total area of all erosions ranged from 70.65 to 480.42 mm² with the average value of 280.30± 35.07 mm². The amount of points for patients with hemorrhagic erosive gastritis and duodenitis according to Rockall Numerical Risk Scoring System was 8 and higher.

Histopathological gastric and duodenal wall evaluation was important in order to differentiate between the erosions and post-mortem stomach lining autolysis seats and artefacts. Micro preparation analysis indicated that all the erosions were deep and extended to the lamina muscularis mucosa. At their basis detritus, a little fibrin, as well as markedly dilated and hyperemated blood vessels were found. Both at the base of the erosion and its sides there was moderate intensity infiltration, consisting of granulocytes, lymphocytes and scarce plasma cells. Epithelial hyperplasia of the surface and the gastric pits was established as well. Gastric and duodenal tissue tests confirmed the diagnosis of hemorrhagic erosive gastritis and duodenitis.

Main illnesses in case of secondary bleeding from erosions were general atherosclerosis (including aorta) –57%, cardiac pathologies with cardiac failure (CHD, hypertension) –7%, chronic pulmonary diseases, including tuberculosis — 14% and non gastric malignancies — 5%. In contrast, the duodenal erosions were mostly found in chronic alcoholics with simultaneous pancreas and liver damage.
We also evaluated UGIB in patients with haematological diseases. During the period of 2013–2014 seventeen autopsies were carried out for patients, who died of lymphoma, leukaemia, including multiple myeloma, but only in 2 cases (11.8%) UGIB was diagnosed. The average length of hospital stay was 12± 3.4 days.

Discussion

Both globally and in the Baltic States, including Latvia, problems associated with UGIB diagnosis, treatment and outcomes are also similar, however each study, of course, reveals certain nuances of the issue under consideration. The view of the pathologist is often important not only in the analysis of patient gastrointestinal biopsies, but also in evaluating the macroscopic and microscopic findings of autopsies.

Our research highlights that there are essentially two large groups of patients with UGIB and that these cases in the clinics have to be analyzed, diagnosed and treated in two ways. For the patients of Group 1, who had bleeding from stomach and duodenal ulcers and oesophageal varicose veins, first of all extensive and rapid blood loss has to be combated and haemostasis has to be ensured through emergency surgery or for the elderly patients through transarterial embolization (20). But in this group of patients, 28% have different comorbidities to be treated in a timely manner instead of during the time of GI haemorrhage. Rockall Numerical Risk Scoring System showed that in the fatal cases with isolated pathologies of gastrointestinal system the grade was only 4.

Our studies have indicated that over the past 15 years, patients with UGIB have become by 10 years younger, which could be explained by the toxic influence of alcohol not only on the liver and pancreas, but also on the stomach. We would also wish to emphasize that, although their impact on the body has not been fully investigated, in recent years also the consumption of the so-called energy drinks and sparkling beverages has greatly increased among the population. Therefore in Latvia since 2014 a campaign among young people has been launched against their use, particularly in schools.

With our study of Group 2 patient analysis, we wanted to emphasize the role of hemorrhagic erosive gastritis and duodenitis in UGIB cases, which has been noted in other publications as well (4, 5, 21) however the aetiology and pathogenesis of their development has not been emphasized. The total bleeding erosion area practically does not differ from the medium stomach or duodenal ulcer areas. Taking into account the concept of the so-called critical bleeding accordingly the guidelines from European Society of Anaesthesiology (22) for 54 patients (45%) it was fatal. Haemorrhagic erosive gastritis was developed in patients with general atherosclerosis, coronary heart disease, chronic lung diseases and malignancies outside the gastrointestinal tract. Atherosclerotic alterations in the aorta branches, which supply the stomach, cause disturbance of hemodynamic of gastric mucosa and focal ischimisation sources. In turn, the effect of poorly compensated coronary heart disease is venous congestion of the stomach wall capillaries. Chronic lung pathology, which in our fatal cases was tuberculosis, chronic bronchitis and chronic obstructive lung disease contribute to tissue hypoxia. However multiple hemorrhagic gastric and duodenal erosions in the cases of non-gastrointestinal tumours, including haematological diseases, developed during terminal / incurable stages of malignancies, in addition, side-effects due to exposure to chemotherapy and radiotherapy cannot be ruled out.

Discrepancies between clinical and pathological diagnoses are still rather high in all countries. Discrepancies in clinical and autopsy diagnoses have not altered much over the years (10, 14, 15), despite the enormous progress in the radiological and endoscopic diagnosis of UGI diseases. In order to reduce the number of the clinically undiagnosed UGIB cases in the light of the results of our research, we recommend to interpret the data of laboratory findings and not to emphasize disease symptoms in medical documentation. The doctors should understand, what the primary disease is, and what has evolved secondarily. Our study can be compared to the publication of Leske M. et al., 1978 (23) on how discrepancies change between admission and discharge diagnosis, and this happens in 26, 8% of the cases. To make each correct diagnosis, the doctor needs experience and time, whereas in UGIB cases, the time factor is unfavourable for medic.

Although there are extensive reports on home health care (24), there is practically no research on the patients, who have died at home in general and on fatal cases directly from UGIB (25). Since in both groups of patients in our study approximately 50% of the people died at the pre-hospitalization stage, this points out once again that the responsibility of the people for their health is low. Probably in other European countries this responsibility is higher and different health insurance models exist there.

Conclusion

This study is a message to family doctors and outpatient doctors of different professions to follow-up diseases of all viscera, instead of focusing solely on gastrointestinal bleeding episodes. Probably not only in our country doctors of different specialisation need more information about the patient background pathologies from electronic data bases regarding treatment in outpatient departments/receptions.

All forms of patient education are important, in order to reduce delays in hospitalization and number of cases of very short hospitalization period prior to death, because during a short stay in a hospital it is not always possible to manage to perform endoscopy and hence adequate treatment of bleeding.
References