

## Acute Bleeding at the Upper Gastrointestinal Tract – Forensic Medical and Pathomorphological Characteristics

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Autopsy cases of acute fatal bleedings of the upper gastrointestinal tract (ABUGIT) are examined. Autopsies, performed in the Department of Forensic Medicine of Medical University of Varna for a ten-year period (1998 – 2007) are characterized according to the frequency and morphological peculiarities. ABUGIT out of a total of 3619 autopsies, 21 cases (0,58%) of ABUGIT are established. They account 1,2% of sudden death cases. The average age is  $52.31 \pm 2.4$ ; 85.7% are men and 14.3% are women, in 33.3% of them alcohol in the blood is found. The distribution of the cases of ABUGIT is as follows: chronic gastric ulcer – 6 cases, erosive gastritis – 4 cases, esophageal varices – 4 cases, mucous erosions of esophagus, stomach and small intestine – 3 cases, duodenal ulcer – 2 cases, erosions of the stomach and esophageal varices – 1 case and malignant tumors – 1 case.

*Key words:* acute bleeding, upper gastrointestinal tract, forensic medical expertise.

### Introduction

Acute bleeding of the upper gastrointestinal tract (ABUGIT) represents more than 90% of the cases with bleeding from the gastrointestinal tract. On time diagnosis ensuring adequate treatment is needed [2]. In 0.9% of the cases ABUGIT causes sudden fast and fatal outcome and these cases are usually an object of forensic expertise [5], unlike the cases of chronic bleeding of the gastrointestinal tract.

The clinical appearance of ABUGIT generally includes hematemesis, melena, anemia and shock. Specifying the cause of the acute bleeding is important for the adequate treatment and avoiding the fatal end in hospital as well as for making clear the mechanisms of death in the post mortem expertise.

The **aim** of the present study is to characterize the range and the morphological special features of cases of fatal ABUGIT, object of forensic expertise during the period 1998-2007.

### Material and Methods

The autopsy materials of the Forensic Medicine Department of the Varna Medical University for the 1998-2007 period and all cases of sudden death resulting from ABUGIT

have been observed and estimated. Expertise and histological materials from forensic autopsies have been studied and from them relevant data and characteristics for each case have been obtained.

## Results

A total of 3619 autopsies were performed in the department. The case distribution by years is shown in Table 1. The cases of ABUGIT are 21, which is 0.58% of all the autopsies. They represent 1.2% of the sudden death cases, ascertained by 1750 dead cases for the same time period (48.35% of all cases). There is a lack of specific dynamics in the case amount on a yearly basis; their number usually varies between one and three cases with the exception of the year 2004 when there were five. All of those observed have died outside hospitals. They are usually lonely people unable to or not willing to seek medical assistance. The reason for autopsy was the suspicion for criminal act and violent death since there was too much blood present at the place they died. Thus the forensic expert encounters ABUGIT at the very scene of the accident, but by inspection only he is not able to determine the origin and the cause for the accident. With the consequent post mortem investigations these questions can be answered and the cause of the death determined.

The average age of the cases is 52.31+/-2,4 years. Males predominate: 18 men and 3 women (85.7%-14.3%). Usually there is a lack of specific data for past complaints, diseases or other damaging factors. In 9 (42.8%) however, there are preliminary data of chronic alcoholic abuse.

Two of the cases were tested for alcohol in other labs and for that reason we did not have data indicating alcohol misuse. In the remaining seven cases (33.3%) the forensic-medical expertise established the use of alcohol immediately before death. In four of them the alcohol concentration was below 0.5‰ but as the alcohol in the urine was not examined it could not be judged whether this was the final phase of its elimination. In the other three cases with alcohol use, one was of light degree and the other two of average; all of them being in elimination stage. This is an important fact as the toxic alcohol influence at this stage is much stronger.

Liver cirrhosis with esophageal involvement was diagnosed in 3 cases; in 12 there were data of chronic diseases variously manifested – hypertensive disease, generalized atherosclerosis including sclerosis of coronary arteries, chronic obstructive pulmonary disease (COPD) and in one case – chronic calculus cholecistitis. However, they did not cause death but only existed in a latent state. With the rest six cases observed, other acute or chronic disease were not diagnosed.

The distribution of the cases according to the established causes for ABUGIT is as follows:

- chronic gastric ulcer – 6 cases;
- erosive gastritis – 4 cases;
- esophageal varices – 4 cases,

Table 1. Total number of autopsies and these with ABUGIT

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Total number of autopsies	360	350	361	352	403	347	401	408	447	190	<b>3619</b>
Persons died of ABUGIT	2	1	2	2	1	1	5	1	3	3	<b>21</b>

- mucous erosions of esophagus, stomach and small intestine – 3 cases;
- duodenal ulcer – 2 cases;
- erosions of the stomach and esophageal varices – 1 case;
- malignant tumors – 1 case.

In the forensic medical expertise the gastric ulcer is described in a classical aspect – round, with raised edges and with thrombosed vessels at the bottom. The erosions of the stomach and esophagus are multiple superficial lesions of the mucous membrane. They have various forms, size and dark red bleeding bottom. The varices of the esophagus are of a typical shape: usually collapsed venous vessels in the distal part of the three patients with liver cirrhosis. The cause of death with these already established bleedings is the hemorrhagic shock.

However, histological investigation was not performed in all forensic medical expertise. Usually the forensic expert reports only the obvious macroscopic marks pointing to the cause of the bleeding. In most of the expertise the main changes, that caused the bleeding, as well as those that caused the death are not determined (exacerbation of the chronic ulcer, fibrinoid necrosis of the vascular wall in the bottom of the ulcer, the character of erosions, signs of decompensation of liver insufficiency, hemorrhagic shock, etc.)

## Discussion

The results show that the sudden death cases from ABUGIT represent 0.58% from all autopsies and 1.2% from those with sudden nonviolent death (48.35%). Of course these data are not absolute because part of the nonviolent death in relation to all the post mortem cases varies in a too wide range for different periods and different parts of the country: from 26.62% for the period 1924-1964 for the forensic department in the city of Sofia [3], to 44.68% for the period 1924-1975 for the region of Varna city [5] and to 54.28% for the period 1971-1980 for the whole country [4]. For this variety there might be various reasons. Not of least importance is the fact that in different periods the whole number of cases brought for forensic autopsy has been different.

The frequency of fatal acute bleeding cases from the upper gastrointestinal tract is actually much higher because autopsy cases from the hospitals are not involved here, since they are not object of forensic expertise. In their structure however, the causes for ABUGIT, determined by the forensic expertise, do not differ from those mentioned in the clinical practice (ulcer disease, erosive gastritis, bleeding esophageal varices, Mallory-Weiss's syndrome, erosive esophagitis, stress ulcer) [2]. In our material only cases of the Mallory-Weiss's syndrome and stress-ulcers are not present.

The knowledge of the causes of fatal bleeding of the upper gastrointestinal tract and their inclusion in the differential diagnosis of processes which could have similar clinical manifestation is a mandatory action for the clinical doctor as well as for the general practitioner. An example of underestimation of the main complaints and the possibility for complications with fatal bleeding is a 28-year-old man. The general practitioner did not accept as serious the patient's continuous stomach complaints, did not require specialist consult and the patient died of acute bleeding. Such kind of negligence illustrates the necessity of thorough understanding of the problem of ABUGIT, especially for the GPs who are at the front line of the public health service.

The histological investigation is an important moment in determining the causes of the bleeding and death. It should not be neglected by the forensic expert because in some cases the macroscopic picture of the changes is not completely informative and errors and inaccuracies may occur.

## Conclusion

The fatal ABUGIT represents 1.2% of the cases with sudden death, determined by forensic-medical expertise for a ten years period in the region of Varna (48.35%).

In the forensic practice, the most common causes for fatal ABUGIT are chronic gastric ulcers followed by erosive gastritis and esophagus' varices.

The structure of the cases of sudden death due to ABUGIT according to this forensic material corresponds to that observed in the clinic.

The histological investigation is obligatory in order to avoid negligence and inaccuracies in determining the causes of bleeding and the cause of death.

What is needed is recognition, precise and timely diagnosis of the illnesses which could prove a cause for the ABUGIT especially on the part of GPs.

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