



Bleeding in Erosive and Ulcerative Lesions of the Upper Digestive Tract in Children

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Abstract

The prospective randomized study included an analysis of the medical histories of 1,330 children. Of these, 101 (7.6%) children had gastrointestinal bleeding. Comparative analysis of etiological, clinical, and endoscopic data revealed characteristic signs of acute and peptic erosive ulcerative lesions of the upper digestive tract. This contributes to timely diagnosis, reduction of hospital stay, adequate therapy, and, accordingly, a decrease in the frequency of such a formidable complication as gastrointestinal bleeding.

Disciplinary: Medicine.

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1 Introduction

The expansive growth in the number of children and adolescents with chronic diseases, including pathology of the digestive system, leading to early disability, requires improvement of diagnostic and treatment methods, as well as the development of preventive measures that reduce

the number of complications in the future [1-5]. Over the past decade, the incidence of pathologies of the gastrointestinal tract has increased almost 2-fold [6-8], and in the overall structure of morbidity in this cohort of diseases in children, the pathology of the upper digestive tract occupies a leading place, which is 54-56%. At the same time, erosive and ulcerative processes in the gastric mucosa and duodenum occupy a large part [9-11].

One of the possible ways to preserve and reproduce soil fertility is the transfer of land from arable land to fallow land. Organic matter accumulates in these areas due to the change of various herbaceous phytocenoses; its soil content and reserves serve as the main criterion for assessing its fertility; in recent years, they are being increasingly considered from the point of view of ecological stability of soils as a biosphere component (Kiryushin et al., 1993).

The purpose of the research was to assess the structure and reserves of humus substances in agrochernozem during the transition to an organic farming system.

2 Literature Review

Currently, the incidence of gastroduodenal pathology, depending on the correlation with the regions of the Russian Federation, ranges from 15 to 48%. At the same time, the frequency of detection of gastroduodenitis and duodenal ulcers in children decreased slightly from 60 to 50% and from 10.7% to 7.2%, respectively. The frequency of gastritis and duodenitis remains at a stable level 20-25% and 15-17%, while the number of various pathologies of the esophagus has increased 2.5 times. Standardized studies allow us to predict the presence in Russia of about 50 thousand children suffering from peptic ulcer disease [12]. According to foreign authors, the frequency of erosive and ulcerative lesions of the upper digestive tract in children in Europe varies from 0.5 to 22% [13]. According to American and British researchers, the frequency of erosive and ulcerative lesions of the upper digestive tract in their countries is about 1.7%. Among all complications, erosive and ulcerative lesions of the upper digestive tract account for 80% of gastrointestinal bleeding [11, 14].

Until recently, it was believed that almost all gastrointestinal bleeding from the upper digestive tract of children is associated with peptic ulcer disease. Nevertheless, the growth of non-ulcerated by the mechanism of bleeding is obvious. According to the latest scientific literature data, the ratio of gastrointestinal bleeding on the background of ulcerative and non-ulcerative lesions (portal hypertension, erosive hemorrhagic gastritis, gastric polyposis, duodenal stasis, Randu–Weber–Osler disease, Peitz–Jaegers syndrome, vascular intestinal ectasia, etc.) is 2:1 [15, 16].

The study of the frequency of symptomatic ulcers is associated with certain difficulties due to the frequent asymptomatic or subclinical course of ulcers when it is possible to verify the diagnosis only during esophagogastroduodenoscopy.

According to the mechanism of occurrence, stress ulcers are statistically most common (about 80%), symptomatic ulcers in cardiovascular diseases are found only in 10-30%, and symptomatic ulcers are less common in endocrine diseases. Acute symptomatic ulcers and erosions of the mucous membrane of the stomach and duodenum in most cases occur as a result of severe

injuries, diseases, and other conditions. According to clinical observations, acute ulcers occur in patients with severe somatic diseases, endogenous intoxication, as well as after severe injuries and operations, which were accompanied by several stressful situations: shock, collapse, hypovolemia, hypoxia, renal and hepatic insufficiency. When three or more of these factors are combined, the risk of symptomatic ulcers clearly increases sharply [17-19].

The relevance of the study is due to the growth of gastroduodenal pathology among children with frequent development of erosive and ulcerative lesions of the stomach and duodenal intestine, which can lead to severe complications up to life-threatening conditions.

The aim of the study was to identify the frequency of gastrointestinal bleeding in erosive and ulcerative lesions of the upper digestive tract, as well as to assess the features of clinical manifestations of such in children living in the territory of the Republic of North Ossetia -Alania in Russia.

3 Method

The study included 1,330 children and adolescents aged 3 days to 17 years with erosive and ulcerative lesions of the upper digestive tube, who were examined in the endoscopy department of the Children's Republican Hospital of Vladikavkaz in the period from 01.01.2015 to 31.12.2019.

Examination of children with destructive lesions of the upper digestive tract included general clinical methods provided by medical and economic standards (collection of anamnesis data, clinical examination, laboratory tests of blood, urine, feces); instrumental examination (esophagogastroduodenoscopy with mucosal biopsy, ultrasound examination of abdominal organs, kidneys X-ray examination of abdominal organs, ECG, ECHO CG, diagnosis of *H. pylori* (rapid urease, histological and respiratory urease method), chromo- and pH-meter using congo-red)) [20-22]. Esophagogastroduodenoscopy was performed for all patients according to the standard procedure on the Olympus GIF XP-20, Pentax FG-24V apparatus [23]. The intensity of bleeding in patients with peptic ulcer diseases was assessed according to the Forrest classification [24]. Statistical processing of the obtained results was carried out using the methods of parametric and nonparametric statistics. The methods of descriptive statistics included the estimation of the arithmetic mean (M), the average error of the mean value (m), and the frequency of symptoms (signs with discrete values). The Student's t -test was used to assess the intergroup differences, and the exact Fisher method was used when comparing frequency values.

4 Result and Discussion

Gastrointestinal bleeding occurred in 101 (7.6%) of 1,330 children with destructive diseases of the upper digestive tract: in 84 (6.3%) of 1,330 children, bleeding was verified during the present hospitalization, and in 19 (1.4%) children – in previous hospitalizations, while 2 children had gastrointestinal intestinal bleeding was repeated. The analysis of etiological factors of bleeding development allowed to form 2 study groups: Group 1 included 56 (55.4%) of 101 observed patients with acute erosions and ulcers, and group 2 consisted of 45 (44.6%) children with gastric and duodenal ulcers. The age of all patients with gastrointestinal bleeding ranged from 3 days to 17

years and averaged 11.3 ± 5.1 years ($m=0.51$). The age of group 1 patients ranged from 3 days to 17 years, averaging 8.7 ± 5.3 years ($m=0.70$), group 2 - ranged from 5 to 17 years, averaging 14.5 ± 2.5 years ($m=0.37$). Male patients were 29 (51.8%) out of 56 people in group 1 and 29 (64.4%) out of 45 patients in group 2. There were no significant differences in gender among patients of both groups ($p>0.05$). In 2 newborn children of the 1st group, it was not possible to identify the intensity of the pain syndrome. The pain-free course of the disease occurred in 24 (44.4%) patients out of 54 patients in the 1st group. The reason for seeking medical help in these patients was other manifestations of gastrointestinal bleeding. Pain syndrome of varying intensity was noted by 30 (55.6%) children of the 1st group. A pain-free course was detected in 2 (4.5%) of 45 patients in the 2nd group. Pain syndrome was detected in 43 (95.5%) patients of the 2nd group. Abdominal pain syndrome was significantly more often present in patients of group 2 compared to patients of group 1. Complaints of dyspeptic phenomena were presented by 9 (16.7%) patients of the 1st group and 29 (67.4%) patients of the 2nd group.

Thus, dyspeptic manifestations were significantly more common in group 2 patients (vomiting with blood admixture was significantly more common in group 1 patients compared to group 2 patients. The spectrum of causes that caused GCC in group 1 children was diverse (Figure 1).

Taking into account the fact that the main etiological factor in the development of erosive changes in the mucous membrane with lesions of the upper digestive tract and duodenal ulcers is a helicobacter infection, patients of both groups were examined for *Helicobacter pylori* (HP). HP was diagnosed using a respiratory urease test and histological examination in 49 (87.5%) children of group 1 and 45 (100%) children of group 2, while HP infection was detected in 34 (69.4%) patients of group 1 and 39 (86.7%) patients of the 2nd group.

H. pylori was significantly more often detected in group 2 children compared to group 1 patients (87.5 and 69.4%, respectively, duodenal bleeding in group 2 children was significantly more common than in group 1 patient - 26 (57.8%) vs. 3 (5.4%), respectively. There were also no significant differences in the frequency of bleeding in both groups – 50 (89.3%) versus 42 (93.3%), respectively. When studying the ways of hospitalization of group 1 patients, it was found that the intensity of bleeding caused the need to stay in the intensive care unit in 11 (19.6%) of 56 children, 39 (69.6%) children were hospitalized in the surgical department, 2 (3.6%) children were sent with a diagnosis of gastrointestinal bleeding from the department pathology of newborns, 3 (3.4%) children – from the infectious department. One (1.8%) child was hospitalized after outpatient esophagogastroduodenoscopy. When studying the ways of hospitalization of group 2 patients, it was revealed that 11 (24.4%) children had a history of bleeding, and the remaining 34 (75.6%) children were admitted to the hospital with bleeding. The intensity of bleeding caused the need to stay in the intensive care unit in 4 (11.8%) of 34 children. 12 (35.2%) of 34 adolescents were referred to the gastroenterology department, 8 of whom were admitted for examination on a planned basis.

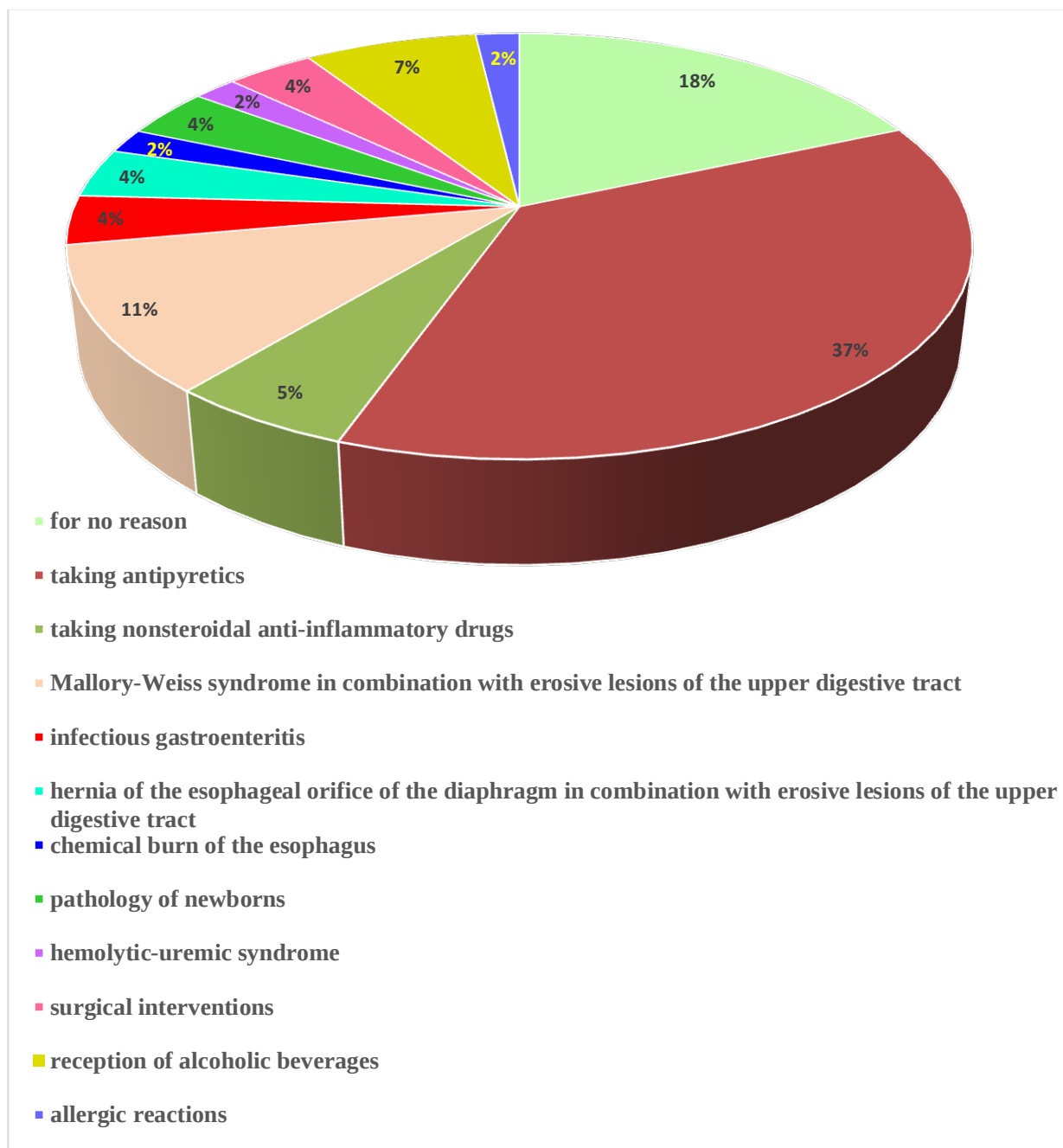


Figure 1: Etiological factors of gastrointestinal bleeding in group 1 patients.

Table 1: Intensity of gastrointestinal bleeding in patients with peptic ulcers

Type of gastrointestinal bleeding		Number of patients, people (%)	Total, people (%)
Ongoing (I)	Ib	1 (2,3%)	3 (7%)
	Ic	2 (4,6%)	
Held (II)	IIa	5 (11,6%)	40 (92,5%)
	IIb	22 (51,3%)	
	IIc	13 (30,2%)	
The Forrest classification is not used		2 (0,5%)	
Total:		45 (100%)	

In this study, 14 (41.2%) children were hospitalized in the surgical department (3 with suspected acute appendicitis, one with late adhesive obstruction, 12 children with suspected gastrointestinal bleeding). Primary hospitalization in non-core departments (neurological and

infectious diseases departments) took place in 2 (5.9%) of 34 children. 2 (5.9%) children refused hospital treatment. In group 2, 2 (4.4%) children refused hospital treatment. The severity of the general condition caused the need to stay in the intensive care unit in 11 (19.6%) of 56 patients of group 1 and in 4 (9.3%) of 43 children of group 2. The duration of inpatient treatment in group 1 patients ranged from 3 to 25 days, in group 2 patients - it from 5 to 31 days. The average duration of inpatient treatment in patients of group 1 was 11.3 ± 6.1 days ($m=0.81$) and was significantly less compared to patients of group 2, whose average duration of inpatient treatment was 15.3 ± 4.6 days ($m=0.70$).

5 Conclusion

Thus, erosive and ulcerative lesions in children and adolescents of the Republic of North Ossetia–Alania were complicated by gastrointestinal bleeding in 7.6% of cases, while peptic ulcers accounted for 44.6% of cases, and acute (symptomatic) erosions and ulcers accounted for 55.4%. Bleeding with symptomatic ulcers was significantly more common in children of younger age groups. It is noteworthy that only half of the children with acute ulcers complained of abdominal pain, and pronounced pain syndrome occurred only in every 10th child. For patients with symptomatic ulcers, it was not possible to identify any clear localization of the pain syndrome. Gastrointestinal bleeding in acute ulcers was accompanied by vomiting of "coffee grounds" or an admixture of scarlet blood, which was confirmed by the discovery of the source of bleeding in the stomach. Among the reasons with which parents or patients themselves could associate bleeding in patients with acute ulcers, medications, low-alcohol beverages and underlying diseases (glomerulonephritis, juvenile rheumatoid arthritis, hemolytic uremic syndrome) came to the fore. Gastrointestinal bleeding in adolescents was significantly more often a complication of peptic ulcer disease. Patients with peptic ulcers are characterized by more frequent development of abdominal pain syndrome, the intensity of which was more pronounced. The most frequent localization of pain was noted in the pyloroduodenal region. In addition, erosive and ulcerative lesions were more often accompanied by dyspeptic manifestations in this category of patients. In patients with peptic ulcers, one of the symptoms of bleeding was melena, which was associated with the localization of the source of bleeding in the duodenum. There were no significant difference in the incidence of HP infection among patients with peptic and symptomatic erosive ulcerative lesions, which indicates a high HP infection in the population of the Republic of North Ossetia-Alania. Despite the revealed differences, the severity of the general condition in patients with acute and peptic ulcers had no significant differences, however, the duration of inpatient treatment was significantly shorter in children with symptomatic ulcers. The conducted study indicates the need for timely diagnosis of erosive and ulcerative lesions of the upper digestive tract in children, which will reduce the time spent in non-core departments, and timely pathogenetic treatment and thereby reduce the incidence of such a formidable complication as gastrointestinal bleeding.

6 Availability of Data and Material

Data can be made available by contacting the corresponding author.

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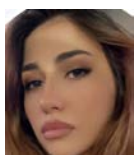
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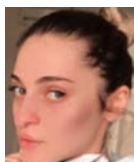
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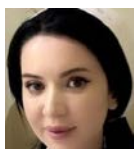
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