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Tactics of therapy for acute gastrointestinal bleeding

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Abstract: *The number of patients with non-varicose acute gastrointestinal bleeding who need anti-coagulants has increased in the last decade. The choice of method and amount of safe therapy in case of acute gastrointestinal bleeding is complicated. A reasonable optimal balance of therapy between hypo- and hypercoagulant components was determined on the basis of an objective assessment of risk factors for re-bleeding and thromboembolic complications. A council of surgeons, resuscitators and cardiologists decided on the rationality of anticoagulant therapy and its scope. With a low risk of recurrent bleeding and a high risk of thromboembolic complications, hemostatic therapy (tranexamic acid, ethamsylate) was combined with the introduction of low molecular weight heparin (bemiparin) in prophylactic doses. An important parameter for the appointment of conservative therapy were thromboelastography. The data obtained indicate the safety of hemostatic and thromboprophylactic therapy (the level of re-bleeding did not differ from the level of bleeding without the use of low molecular weight heparins, according to the literature). Stroke was observed in only 1 patient. The complexity, multifactorial and diversity of clinical conditions of patients with acute gastrointestinal bleeding indicates the need for further study of the treatment problem.*

Key words: [Anticoagulants](#), [blood coagulation](#), [hemostasis](#), [gastrointestinal hemorrhage](#).

Introduction

The number of patients with non-varicea acute gastrointestinal bleeding is steadily increasing (Lau, L. H., & Sung, J. J. (2021); Yen et al. (2021); Gralnek et al (2021). The proportion of patients requiring anticoagulants has increased in the last decade. Given that this therapy is vital in most cases, the choice of method and amount of safe therapy in case of acute gastrointestinal bleeding is difficult. An individual approach, temporary suspension or replacement with safer drugs is required (Tarasenko et al (2021); Baron et al (2013); Little et al (2021). This requires the development of an appropriate algorithm to avoid thromboembolic complications and hemorrhagic complications in the form of recurrent bleeding. The decision on the amount of therapy

depends on the balance between thrombotic risks in a particular patient compared with hemorrhagic risk (Vivas D et al (2018), Глумчер Ф.С. et al (2016)., Тарасенко С.А. et al (2020). An objective assessment of both risks helped to find a reasonable optimal balance between hypo- and hypercoagulation; correct understanding and application of safe time intervals. Preoperative risk assessment of thromboembolic and hemorrhagic complications. Preoperative assessment of the need for continued or discontinued antiplatelet/ anticoagulant therapy should be based on several factors, assessing the significance of each.

Aim

The aim of current study is optimization of anticoagulant and antithrombotic therapy in patients with gastrointestinal bleeding.

Methods

We observed 112 patients with non-varicose acute gastrointestinal bleeding. Demographics are shown in Table 1.

Sex	Number	%
Women	36	32,1
Men	76	67,9
Total	112	100

Table 1. Demographic data of the compared groups.

All of them studied the hemostasis system. The state of coagulation, anticoagulation and fibrinolytic systems, as well as platelet hemostasis in 30 (26.8%) patients with mild blood loss, 54 (48.2%) - with moderate severity, 24 (21.4%) - with severe . and 4 (3.6 %). We observed 112 patients with non-varicose acute gastrointestinal bleeding. All of them studied the hemostasis system. The state of coagulation, anticoagulation and fibrinolytic systems, as well as platelet hemostasis in 30 (26.8%) patients with mild blood loss, 54 (48.2%) - with moderate severity, 24 (21.4%) – with severe, and 4 (3.6%) - with extremely severe blood loss.

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Depending on the endoscopic picture in patients with peptic ulcer disease, there are active (type Forrest Ia or Ib) and bleeding (type Forrest II or III). Endoscopic examination allows to verify the source of bleeding in the upper gastrointestinal tract (Table 2).

Endoscopic changes can also judge the risk of early recurrence of bleeding.

After a comprehensive examination of the patient used a scale of assessment and prognosis, the risk of re-bleeding in acute gastrointestinal bleeding - Glasgow Blatchford Glasgow-Blatchford score (GBS).

The calculation of the parameters of the Glasgow Blatchford scale was performed using an online calculator at the link <https://www.mdcalc.com/glasgow-blatchford-bleeding-score-gbs>.

Indicators up to 2 points (according to some authors up to 5 points) indicated a low probability

Characteristics of bleeding	Number	%
Forrest I	7	6,3
Forrest IIa	24	21,4
Forrest IIc, III	69	72,3
Total	112	100

Table 2 . Distribution of patients with acute gastrointestinal bleeding according to Forrest II.

of re-bleeding, the possibility of outpatient treatment. Starting with 3 points, patients were hospitalized, intensive care and observation. With an increase in pain > 6, the risk of secondary bleeding was high.

In order to assess the risk of thromboembolic complications, the values of the parameters of coagulation, anticoagulation and fibrinolytic systems, as well as platelet hemostasis were used. The complexity of this buffer system, many indicators and the length of their determination forced us to turn to determine the parameters of thromboelastography (TEG).

Consideration of the risk ratio of secondary acute gastrointestinal bleeding was the basis for the appointment of therapy that would be aimed at the prevention of thromboembolic complications.

Emergency endoscopy in the presence of direct symptoms of acute bleeding from gastrointestinal tract. Endoscopy is considered the gold standard of diagnosis and intervention. It was performed within 24 hours of treatment to diagnose and treat active bleeding and to prevent re-bleeding, and not wait more than 24 hours. Detection of blood in the wash water during the nasogastric tube confirms the bleeding.

Treatment of acute gastroduodenal bleeding has always started with conservative therapy (primarily infusion-transfusion) and endoscopic stop, which were carried out in parallel with the subsequent dynamic examination of the patient.

In the presence of indications (bleeding Forrest I, IIa - arterial bleeding or at the bottom of the ulcer thrombosed artery of significant size with traces of recent bleeding) we used a combined method of therapeutic endoscopy - thermocoagulation and injection hemostasis (14 observations - 12.5%). Many authors provide convincing evidence in favor of such a combination in the treatment of patients with very severe ulcerative hemorrhage (Lau, J. Y. et al... & Li, A. K. (1997); Chung S.S, et al. (1997); Lau J.Y., et al (1999).

Injectable hemostasis consisted of introducing a solution of adrenaline (dilution 1: 100,000) into the bleeding area.

Results and Discussion

In 1 patient after endoscopic biopsy and histological examination, further intervention was performed on the verified tumor.

In 31 patients there was antithrombotic therapy. The algorithm for its assignment was as follows. The risks of re-bleeding and thromboembolic complications were compared.

According to the parameters of the Glasgow Blatchford scale, the risk of recurrence of bleeding and the prognosis of treatment results were determined. From 2 to 5 points the prognosis was favorable, the likelihood of recurrent bleeding is negligible. In the group of patients with such indicators, thromboprophylaxis, if necessary, was relatively safe.

A score of ≥ 6 indicated a high risk of gastrointestinal bleeding recurrence; even if there is evidence that prior to the prevention of thromboembolic complications, the purpose and scope of it was carried out individually, in consultation with specialists. Factors that indicate the desired thromboprophylaxis and high risk of thromboembolic complications included:

- Stroke with possible prophylactic use of antiplatelet agents or low molecular weight heparins;
- Diseases of the cardiovascular system with possible prophylactic administration of antiplatelet agents or low molecular weight heparins;
- Varicose veins of the lower extremities in the anamnesis or detected during the examination.

Thromboelastography (TEG) data were an important parameter for the appointment of conservative therapy.

The state of "norm" did not require drug anticoagulant therapy, and the "state of coagulation factor deficiency" involved the correction of coagulation-anticoagulation factor of tranexamic or aminocaproic acid systems, etamsylate.

Thromboelastography in the state of hypercoagulation was characterized by the following parameters: R (time delay of the beginning of thrombus formation) - reduced <3 ' ; angle α (alpha angle - involved in the curve at the point K, N - 54-80) - increased $> 80^\circ$; K (time from the end of R to reaching the clot) - shortened <0.5

' ; MA (maximum amplitude - clot strength) - increased > 78 mm.

The value of TEG in "disseminated intravascular coagulation syndrome - (early stage) was characterized by accelerated thrombus formation and disintegration: R - reduced <3 ' ; angle α - increased $> 80^\circ$; K - shortened <0.5 ' ; MA - increased > 78 mm; LY30 - % of thrombus lysis for 30 ' 9%.

Thromboelastography in DIC syndrome - late stage: angle $<54^\circ$; K - increased > 3 ' ; R > 9 ' ; MA - reduced <54 mm; K - extended > 9 minutes ('); MA - maximum amplitude > 78 mm.

All patients with acute gastrointestinal bleeding and varicose veins of the lower extremities were required to use compression underwear or elastic bandages; topically applied tranexamic gel and heparin gel. Assignment of prophylactic doses of low molecular weight heparin bemiparin - 2500 and 3500 IU (prophylactic doses) with a predominance of risk factors for thrombosis over the risk of re-bleeding; the decisive factors were TEG indicators. Therapy was started 10-12 hours after hemostasis and the start of drug hemostatic therapy.

In cases of stroke and cardiovascular disease, with possible prophylactic use of antiplatelet agents, the latter was canceled. After intensive hemostatic treatment (endoscopic hemostasis and conservative therapy) continued correction of cardiovascular disorders (correction of blood pressure, heart rate, etc.) in conjunction with cardiologists. A council of surgeons, resuscitators and cardiologists decided on the rationality of anticoagulant therapy and its scope. The risks of recurrent bleeding and the likelihood of thromboembolic complications were considered. TEG indicators were crucial; they were also indicators of the effectiveness of treatment (3-7 days after starting therapy).

The dynamics of TEG (for 3 and 5 days) showed a change in parameters approaching the state of "normal". The dynamics of conditions characterized as "state of coagulation factor deficiency" or increase in the time of formation and maturation of the thrombus was not observed.

Only 4 patients (12.8%) had recurrent bleeding; in 1 case - a patient with gastric cancer, in connection with which, after histological verification of the diagnosis, radical surgery was performed. In 2 cases, repeated endoscopic coagulation and injection of adrenaline into the surrounding tissues allowed to achieve a stable hemostatic effect.

The results obtained indicate the safety of individual thromboprophylaxis in patients with acute gastrointestinal bleeding, taking into account risk factors. Repeated bleeding (12.8%) corresponds to the level of repeated bleeding according to other authors.

Accounting for thromboembolism showed the following. Acute cerebrovascular disorders were observed in 1 patient (32%). Carrying out of the corresponding therapy allowed to restore dysfunction for 4 weeks. Circulatory disorders in the extremities (arterial or venous) were not observed.

Conclusion

1. Conservative therapy in patients with acute gastrointestinal bleeding should take into account the risks of both: recurrent bleeding and thromboembolic complications.
2. The results of individual complex therapy indicate the safety and effectiveness of thromboprophylaxis.
3. The complexity, multifactorial and diversity of clinical conditions in patients with acute

gastrointestinal bleeding indicates the need for further study of this problem.

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Conflict of interests

None of the authors received research grants, speaker's fees from any companies and is not a member of commissions.

Consent to publication

All authors have read and approved the final version of the manuscript. All authors have agreed to publish this manuscript.

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- A – Research concept and design,
- B – Collection and/or assembly of data,
- C – Data analysis and interpretation,
- D – Writing the article,
- E – Critical revision of the article,
- F – Final approval of article

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Тактика терапії при гострих шлунково-кишкових кровотеч

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Анотація: Питома вага пацієнтів з неварикозними гострими шлунково-кишковими кровотечами, які потребують антикоагулянтів, збільшується в останнє десятиліття. Вибір способу та обсягу безпечної терапії у разі виникнення гострих кишково-шлункових кровотеч ускладнюється. Було визначено обґрунтований оптимальний баланс терапії між гіпо- та гіперкоагуляційними складовими на основі об'єктивної оцінки факторів ризику повторної кровотечі та тромбоемболічних ускладнень. Консиліум у складі хірургів, реаніматологів та кардіологів вирішував раціональність проведення антикоагулянтної терапії та її обсяг. При низькому ризику повторних кровотеч і високому ризику тромбоемболічних ускладнень гемостатична терапія (транексамова кислота, етамзілат) поєднувалася введенням низькомолекулярного гепарину беміпаріну в профілактичних дозах. Важливим параметром для призначення обсягу консервативної терапії були показники тромбоеластографії. Отримані дані свідчать про безпеку застосування гемостатичної та тромбопрофілактичної терапії (рівень повторних кровотеч не відрізнявся від рівня кровотеч без застосування низькомолекулярних гепаринів, за даними літератури). Інсульт головного мозку спостерігався лише у 1 хворого. Складність, багатофакторність та різноманітність клінічних станів хворих з гострими шлунково-кишковими кровотечами свідчить про необхідність подальшого вивчення проблеми лікування.

Ключові слова: Антикоагулянти, згортання крові, гемостаз, шлунково-кишкові кровотечі.



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