UDC 616.831-005.1-036.82-085.273:616.151.5
https://doi.org/10.31612/2616-4868.6.2026.04

CLINICAL RATIONALE FOR INDIVIDUALIZING SECONDARY PREVENTION IN PATIENTS WITH ATHEROTHROMBOTIC STROKE BASED ON PLATELET AGGREGATION MONITORING

Olga Ya. Mykhaloiko, Igor Ya. Mykhaloiko

Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine

Abstract

Introduction. Despite the status of acetylsalicylic acid (ASA) as the «gold standard» for secondary stroke prevention, the prevalence of resistance to it varies from 5% to 65%.
Aim. To identify the leading pathogenetic factors for the occurrence of recurrent ischemic events in patients with atherothrombotic stroke (ATS) against the background of standard secondary prevention and to scientifically substantiate the algorithm for choosing personalized antiplatelet therapy depending on individual sensitivity to antiplatelet agents.
Materials and methods. A clinical and neurological examination of 200 patients (116 men, 84 women; mean age 60.4 ± 7.4 years) in the recovery period of ATS was performed. CT/MRI of the brain, ultrasound of extracranial vessels, EchoCG and 72-hour Holter ECG monitoring were performed. The functional activity of platelets was studied by optical aggregometry with the inducer adrenaline. Aspirin resistance (AR) was verified if the degree of aggregation exceeded 60%. Control group – 50 practically healthy individuals. Statistical analysis was performed in STATISTICA 8.0.
Results. During the year of observation against the background of standard therapy (ASA, statins, antihypertensive, hypoglycemic agents) recurrence of ischemic stroke was recorded in 52 patients (26.0%). In 7.69% of cases (n = 4) the cause of the recurrent stroke was the transformation of the pathogenetic subtype of stroke from atherothrombotic to cardioembolic due to the detected paroxysmal atrial fibrillation. Among the remaining 48 individuals with confirmed atherothrombotic genesis of recurrence, AR was confirmed in 47.9% of cases (n = 23), while the degree of platelet aggregation was 85.4 [75.1; 97.2] %, which was 2.01 times higher than the control values ($p < 0.01$). The detected AR caused a revision of the antithrombotic strategy and the transition from ASA to clopidogrel (75 mg/day).
Conclusions. The main factor in the ineffectiveness of standard secondary prevention in 47.9% of patients with recurrent ATS is laboratory resistance to ASA, which dictates the need for routine aggregometry. Verification of AR is the basis for correction of therapy by replacing ASA with clopidogrel, which provides stabilization of platelet hemostasis through an alternative biochemical mechanism.

Keywords: **atherothrombotic stroke, recurrent stroke, aspirin resistance, aspirin, clopidogrel**

INTRODUCTION

Cerebrovascular diseases (CVD) remain a global medical and social problem worldwide. High mortality and disability rates, huge costs for treatment, rehabilitation, secondary prevention, and patient care make the problem of CVD in Ukraine a nationwide one [1-2]. A previous stroke is associated with a significant increase in the risk of developing a second stroke up to 20% during the first year. Moreover, disability due to the first stroke is 65-80%, and with a second stroke, it increases to 90-95%, placing a heavy burden on the family and the healthcare system as a whole [3-4].

Antithrombotic therapy is mandatory for all patients who have suffered an ischemic non-cardioembolic stroke. To date, the most common, relatively safe and affordable drug that has not lost its status as a standard antiplatelet agent is acetylsalicylic acid (ASA) – aspirin [5, 7].

According to the results of a meta-analysis that included 287 studies and more than 130 thousand patients, aspirin in patients with a high risk of cardiovascular

events reduces the relative risk of vascular mortality by only 25%, however, according to literature data, the rate of aspirin resistance among patients after ischemic stroke is quite high and varies from 5% to 65% [8]. This indicates that from 5% to 65% of patients taking aspirin for the prevention of recurrent strokes may not receive the expected therapeutic effect, which increases the risk of recurrent vascular events [6-8].

An alternative antiplatelet drug used in secondary stroke prevention, according to the standard (2022), is clopidogrel; however, studies show that the prevalence of resistance to clopidogrel also occurs, and ranges from 20% to 30% depending on genetic and environmental factors [3, 7].

However, not all authors share the opinion that aspirin resistance (AR) is a clinical problem, relying on the fact that it is only a laboratory phenomenon that does not require treatment correction.

At the moment, many causes of AR are being discussed. According to the memorandum of the Working Group on the Study of ASA Resistance of the International Society on Thrombosis and Hemostasis, it may be due to: increased formation of arachidonic acid metabolites by the lipoxygenase pathway; low patient compliance with aspirin treatment (in 2% of patients) or inadequate dosage; polymorphism of the cyclooxygenase gene or the GP IIb/IIIa glycoprotein gene; endothelial dysfunction, which is accompanied by increased activity of von Willebrand factor and decreased prostacyclin levels; hypercholesterolemia, which increases the rigidity of platelet membranes and impairs the sensitivity of glycoprotein receptors; diabetes mellitus; parallel use of NSAIDs [7-10].

S. Patrono et al. (2005), observing the level of platelet aggregation in patients who received ASA for 2 years for prophylactic purposes, found that after 2 months in 27% of patients it not only did not decrease, but in some cases it increased, and after 2 years the number of such patients increased to 53%. Similar results were obtained by P. Wenaweser (2006) in patients after stenting. These data suggest the fact of the development of secondary insensitivity to aspirin.

However, regardless of the cause of resistance, insufficient «response» to ASA is associated with a fourfold increase in the risk of cardiovascular complications compared to aspirin-sensitive patients, which necessitates a deeper study of the causes of AR, the establishment of its presence and ways to optimize antiplatelet therapy in the prevention of vascular catastrophes [11].

There is no generally accepted standard for assessing sensitivity to antiplatelet agents, optical aggregometry is recognized as the «gold standard»; however, the choice of an aggregation inducer remains debatable [12]. According to the results of a number of studies, the use of adenosine diphosphate and adrenaline as an aggregation inducer shows high sensitivity for the functional activity of platelets; however, adrenaline-induced aggregation is specific for determining AR, and the use of ADP is specific for monitoring the effects of thienopyridines (clopidogrel) [13]. According to some authors [Saraf S., Bensalha I., Gorog D., 2007], laboratory interpretation of resistance to antiplatelet drugs, in particular to aspirin, should be routine, as well as determination of cholesterol and glucose in the blood in everyday clinical practice. Therefore, the development and improvement of methods for assessing the effectiveness of aspirin remains an urgent problem of secondary prevention of ischemic strokes, as it creates the prerequisites for individualizing preventive therapy and developing more effective ways to prevent cerebral vascular accidents.

One of the reasons for the ineffectiveness of antiplatelet therapy in patients with a previous atherothrombotic stroke may be the replacement of the etiopathogenetic subtype of stroke with a cardioembolic one, due to the appearance of atrial fibrillation, which emphasizes the importance of repeated Holter monitoring to clarify the diagnosis. In such cases, patients are recommended to use anticoagulant therapy (ESC, 2024). The occurrence of a second stroke against the background of the use of secondary prevention drugs and the lack of clarity of the entire range of provoking factors dictates the need to search for these causes and determine ways to correct them.

AIM

To identify pathogenetic factors for the occurrence of recurrent ischemic events in patients with atherothrombotic stroke against the background of standard secondary prevention and to justify the choice of antiplatelet therapy depending on sensitivity to antiplatelet agents.

MATERIALS AND METHODS

The study was conducted at the Stroke Center of the Ivano-Frankivsk Regional Council of the Central Hospital of the Regional Hospital of the Ivano-Frankivsk Regional Council. The *inclusion criteria* were a confirmed diagnosis of atherothrombotic ischemic stroke according to the TOAST classification. The *exclusion criteria* were: cardioembolic stroke, decompensated heart, respiratory, hepatic and renal failure, oncological pathology, severe cognitive impairment. All participants underwent a clinical and neurological examination, CT/MRI of the brain, ultrasound of extracranial vessels, ECG, EchoC G. Among the examined there were 116 men and 84 women aged (60.42 ± 7.4) years. The control group consisted of 50 practically healthy individuals matched by age and sex with the studied patients (26 men and 24 women), without signs of cerebral circulation disorders and severe somatic pathology.

The functional activity of platelets was investigated by laser aggregometry on the Biola Aggregation Analyser. The analysis included a computerized evaluation of light transmission curves with determination of the degree (%), rate (%/min) and time (sec) of aggregation. To increase the sensitivity of the method, stimulated aggregation was assessed using adrenaline at the minimum effective concentration. Aspirin resistance (AR) was verified if the optical permeability threshold was exceeded by more than 60%.

Statistical processing of the obtained results was carried out using the STATISTICA 8.0 software. Verification of the compliance of the distribution of quantitative data with the law of normality was carried out using the Shapiro–Wilk test. Since most of the indicators had a distribution different from normal, the data are presented in the form of median (Me) and interquartile range [Q_1; Q_3]. For comparison of independent samples (main and control groups), the non-parametric Mann–Whitney U-test was used. Qualitative characteristics are given in the form of absolute frequencies (n) and percentages (%). Results were considered statistically significant at ($p < 0.05$).

RESULTS

In the first stage of the study, a dynamic observation of a cohort of 200 patients in the early recovery period of atherothrombotic stroke (ATS) was conducted, who received standard secondary prevention (antiplatelet ASA, statins, antihypertensive therapy and glucose-lowering drugs in the presence of diabetes).

All subjects were consulted by a vascular surgeon to determine the indications and assess the possibility of performing carotid endarterectomy. Surgical intervention was performed in 11 (5.5%) patients, who in the postoperative period continued to receive standardized therapy to prevent recurrent stroke.

Analysis of the frequency of recurrent vascular events, namely ischemic stroke, during the first year of observation, despite compliance with the secondary prevention protocol, was recorded in 52 patients (26.0%). This confirms the high vulnerability of this category of patients and insufficient protection based on the use of all options for preventing recurrent vascular catastrophe.

Subsequently, to clarify the genesis of recurrent stroke, all 52 patients underwent Holter monitoring with ECG and blood pressure recording (duration 72 hours) to detect paroxysms of atrial fibrillation. In 4 people (7.69% of the recurrence group), a heart rhythm disturbance (paroxysmal form of atrial fibrillation) was verified for the first time. This indicated a change in the pathogenetic subtype of stroke from atherothrombotic to cardioembolic, which required the withdrawal of antiplatelet agents and the appointment of new oral anticoagulants to prevent recurrent stroke.

The remaining 48 patients (with confirmed atherothrombotic genesis of recurrent stroke) underwent an assessment of platelet functional activity by optical aggregometry with the inducer adrenaline to determine sensitivity to aspirin (Table 1). In 47.9% of cases (n = 23) resistance to ASA (aggregation level > 60%) was noted. The average degree of aggregation in these patients was 85.4[75.1; 97.2] %, which significantly exceeded the indicators of the control group ($p < 0.05$). Laboratory verification of insensitivity to ASA in 47.9% of patients with recurrent atherothrombotic stroke confirmed the key role of this phenomenon in the occurrence of a repeated ischemic event.

The detection of AR in the relapse group became a pathogenetic justification for the correction of the antiplatelet strategy by switching to a drug with a different point of application, clopidogrel (75 mg/day), which provides selective and irreversible blockade of P2Y12 receptors to adenosine diphosphate (ADP). This tactic allows eliminating the risks associated with the phenomenon of aspirin resistance, to ensure inhibition of the ADP-dependent platelet aggregation pathway and to reduce the frequency of side effects from the digestive system, which is in line with the current recommendations of the ESO (European Stroke Organisation) and AHA/ASA.

Table 1

Indicators of Platelet Functional Activity in Patients with Recurrent Atherothrombotic Stroke and Control Group Individuals, Me [Q1; Q3]

Aggregation indicator	AR group (relapse), n=23	Control group, n=50	Significance level (p)
Degree of aggregation, %	85.4 [75.1; 97.2]	42.4 [37.5; 48.8]	< 0.01
Aggregation rate, %/min	35.4 [29.5; 42.2]	16.8 [14.7; 19.7]	< 0.01
Aggregation time, sec	297 [267; 321]	415 [386; 449]	< 0.05
Platelet count, (thousands/μl)	265.2 [220.8; 282.7]	269.3 [214.6; 290.3]	>0.05

Note: p – significance of the difference between the relapse group and the control group (according to the Mann-Whitney test).

As shown in the table, in patients with recurrent atherothrombotic stroke, while taking ASA, there is a significant activation of all parameters of platelet hemostasis. The most pronounced changes concern the degree of aggregation, which in the AR group exceeded the control indicators by 2.01 times ($p < 0.01$). The combination of a high process speed (35.4%/min) with a reduction in the time to the onset of

aggregation (297 sec) forms a pathogenetic basis for the implementation of repeated ischemic events due to the ineffectiveness of standard antiplatelet therapy. The leading factor in the recurrence of a second stroke in patients with preserved sensitivity to ASA should be considered the progression of stenosing atherosclerosis and destabilization of atherosclerotic plaques. This dictates the need to optimize hypolipidemic therapy using high-intensity statin therapy and the addition of ezetimibe or considering surgical revascularization (carotid endarterectomy).

DISCUSSION

The obtained results confirm the complexity and multifactorial nature of the problem of secondary prevention of ATS. The high frequency of recurrent vascular events (26.0% during the first year of observation) recorded in our study correlates with world statistics. The central aspect of our work was the study of the phenomenon of AR as a leading factor in the ineffectiveness of standard preventive therapy. The prevalence of AR we found at 47.9% among people with recurrent stroke is consistent with the results of studies by Khan H. and Kanny O. (2021), which indicate the variability of this indicator from 5% to 65%. Moreover, our data complement the recent findings of E. Lichkova et al. (2024), who demonstrated a statistically significant relationship between insensitivity to ASA and a high frequency of relapses (75% in the AR group versus 22% in the sensitive group). A significant increase in the degree of aggregation in patients of our AR group to 85.4% ($p < 0.01$) compared to the control indicates a profound activation of platelet hemostasis, which eliminates the protective effect of aspirin.

Comparative analysis of therapy strategies indicates the advantages of an individualized approach. The establishment of a high level of aggregation against the background of ASA became a pathogenetic justification for switching to clopidogrel. However, taking into account the data of Snoep J. D. (2007) on the presence of resistance to clopidogrel (20-30%), we emphasize the importance of using optical aggregometry with the ADP inducer to monitor the effectiveness of thienopyridines.

An important result of the study was the detection of the transformation of the pathogenetic subtype of stroke. The detection of paroxysmal atrial fibrillation in 7,69% of patients with recurrent stroke emphasizes the dynamics of the etiological factors of CVD. This is in line with the current recommendations of the ESC (2024) and ESO regarding the need for careful follow-up in case of ineffective antiplatelet therapy for a timely change of strategy in favor of anticoagulants.

Thus, our study confirms that routine assessment of platelet functional activity using optical aggregometry is not only a diagnostic tool, but also a prerequisite for the formation of an effective personalized algorithm for secondary prevention of cerebrovascular accidents.

CONCLUSIONS

It was found that in 7.69% of cases, the cause of recurrent ischemic events is the transformation of the stroke subtype from atherothrombotic to cardioembolic. This dictates the need for mandatory Holter ECG monitoring to verify latent forms of atrial fibrillation and timely transition from antiplatelet agents to direct oral anticoagulants.

The leading factor in the ineffectiveness of standard prophylaxis in 47.9% of patients with recurrent atherothrombotic stroke is ASA resistance.

The preservation of stably high platelet aggregation (85.4%) against the background of ASA administration neutralizes its pharmacological effect and requires routine laboratory monitoring of the aggregation profile.

The high prevalence of the phenomenon of insensitivity to ASA justifies the feasibility of preventively changing the therapeutic regimen and switching to a drug with a different mechanism of antiplatelet action, a P2Y12 receptor blocker (clopidogrel), which will stabilize the functional activity of platelets and reliably minimize the risk of repeated ischemic catastrophes.

Perspectives for further research. It is planned to compare the effectiveness of aspirin and clopidogrel in the secondary prevention of atherothrombotic strokes with assessment of the frequency of stroke recurrence and monitoring of hemorrhagic complications. Given the prevalence of resistance to clopidogrel, it is planned to conduct ADP-induced aggregometry to monitor the therapeutic response to thienopyridines.

COMPLIANCE WITH ETHICAL REQUIREMENTS

The study was approved by the Bioethics Commission of the IFNMU (protocol No. 149/25 dated January 23, 2025) and was performed in accordance with the provisions of the 1964 Declaration of Helsinki. Upon inclusion in the study, all patients signed a voluntary informed consent.

Study limitations. The study is a single-center study conducted at a specialized stroke center, which may limit the generalizability of the findings to the general population of patients with atherothrombotic stroke in other regions.

The period of clinical observation of patients and assessment of the effect of switching to clopidogrel was limited to 12 months, which does not allow assessing long-term prognosis.

To minimize these limitations, it is advisable to implement a multicenter design in the future, extend the

follow-up to 3-5 years, and use multimodal hemostasis monitoring with several aggregation inducers.

Primary data and materials. All primary documentation (patient medical records, platelet aggregation protocols, Holter ECG monitoring results, statistical database) are reliable and preserved in full.

For reasons of compliance with bioethical standards, protection of personal data and confidentiality of patients, primary materials are not made publicly available. However, depersonalized statistical data and calculation matrices may be provided by the corresponding author upon reasonable request for scientific verification or review of the results.

Declaration of the use of generative AI in manuscript preparation. This work did not use artificial intelligence to generate text, analyze data, or create images. All content is prepared by the authors, who are solely responsible for its accuracy, originality, and adherence to ethical standards.

FUNDING AND CONFLICT OF INTEREST

This study was self-funded. The authors declare no conflicts of interest. All authors have consented to the publication of this manuscript.

AUTHOR CONTRIBUTIONS

Mykhaloiko O. Ya.[A, B, C, D, E, F]

Mykhaloiko I. Ya.[A, E]

REFERENCES

1. Shah, J., Liu, S., & Yu, W. (2022). Contemporary antiplatelet therapy for secondary stroke prevention: a narrative review of current literature and guidelines. Stroke and vascular neurology, 7(5), 406-414. https://doi.org/10.1136/svn-2021-001166.
2. Feske S. K. (2021). Ischemic Stroke. The American journal of medicine, 134(12), 1457-1464. https://doi.org/10.1016/j.amjmed.2021.07.027.
3. Parsa-Kondelaji, M., & Mansouritorghabeh, H. (2023). Aspirin and clopidogrel resistance; a neglected gap in stroke and cardiovascular practice in Iran: a systematic review and meta-analysis. Thrombosis journal, 21(1), 79. https://doi.org/10.1186/s12959-023-00522-2.
4. Del Giovane, C., Boncoraglio, G. B., Bertù, L., Banzi, R., & Tramacere, I. (2021). Antiplatelet drugs for secondary prevention in patients with ischemic stroke or transient ischemic attack: a systematic review and network meta-analysis. BMC neurology, 21(1), 319. https://doi.org/10.1186/s12883-021-02341-2.
5. Yang, Y., Huang, Z., & Zhang, X. (2021). Efficacy and safety of clopidogrel and/or aspirin for ischemic stroke/transient ischemic attack: An overview of systematic reviews and meta-analysis. Medicine, 100(50), e27804. https://doi.org/10.1097/MD.0000000000027804.
6. Mykhaloiko, O.Ya., Hryb, V.A., Kupnovytska-Sabadosh, M.Yu., Mykhaloiko, I.Ya., & Mykhaloiko, I.S. (2020). Rezystentnist do atsetylsalitsylovoi kysloty u patsiientiv iz perenesenym hostrym ishemichnym insultom. [Resistance to acetylsalicylic acid in patients with acute ischemic stroke]. Bukovynskyi medychnyi visnyk – Bukovina Medical Bulletin, 24(1), 74-78.
7. Mykhaloiko, O. J., Gryb, V. A., Fabryka, I. M., Hotsaniuk, O. I., Shalamai, U. P., Salyzhyn, T. I., & Mykhaloiko, I. J. (2025). Diagnostic value of lipoprotein-associated phospholipase A2 in patients in the early recovery period of atherothrombotic stroke. Wiadomosci lekarskie (Warsaw, Poland: 1960), 78(6), 1119-1124. https://doi.org/10.36740/WLek/204797.
8. Khan, H., Kanny, O., Syed, M. H., & Qadura, M. (2022). Aspirin Resistance in Vascular Disease: A Review Highlighting the Critical Need for Improved Point-of-Care Testing and Personalized Therapy. International journal of molecular sciences, 23(19), 11317. https://doi.org/10.3390/ijms231911317
9. Mykhalojko, O.Ya., Mykhalojko I.Ya. (2023). Potential circulating biomarkers of atherosclerotic plaque vulnerability in patients in the early recovery period of atherothrombotic stroke. Ukrainian Biochemical Journal. (95)1, 58-63. doi: https://doi.org/10.15407/ubj95.01.058.
10. Lichkova, E., Nakova, V. V., Arsovska, A., Shorova, M., & Stomnaroska, D. R. (2024). Aspirin Resistance and Ischemic Stroke. Prilozi (Makedonska akademija na naukite i umetnostite. Oddelenie za medicinski nauki), 45(2), 37-46. https://doi.org/10.2478/prilozi-2024-0014.
11. Topçuoglu, M. A., Arsava, E. M., & Ay, H. (2011). Antiplatelet resistance in stroke. Expert review of neurotherapeutics, 11(2), 251-263. https://doi.org/10.1586/ern.10.203
12. Hvas, A. M., & Favaloro, E. J. (2017). Platelet Function Analyzed by Light Transmission Aggregometry. Methods in molecular biology (Clifton, N.J.), 1646, 321-331. https://doi.org/10.1007/978-1-4939-7196-1_2
13. Alvitigala, B. Y., Gooneratne, L. V., Constantine, G. R., Wijesinghe, R. A. N. K., & Arawwawala, L. D. A. M. (2020). Pharmacokinetic, pharmacodynamic, and pharmacogenetic assays to monitor clopidogrel therapy. Pharmacology research & perspectives, 8(6), e00686. https://doi.org/10.1002/prp2.686

Резюме

КЛІНІЧНЕ ОБҐРУНТУВАННЯ ІНДИВІДУАЛІЗАЦІЇ ВТОРИННОЇ ПРОФІЛАКТИКИ У ПАЦІЄНТІВ ІЗ АТЕРОТРОМБОТИЧНИМ ІНСУЛЬТОМ НА ОСНОВІ МОНІТОРИНГУ АГРЕГАЦІЇ ТРОМБОЦИТІВ

Ольга Я. Михалойко, Ігор Я. Михалойко

Івано-Франківський національний медичний університет, м. Івано-Франківськ, Україна

Вступ. Незважаючи на статус ацетилсаліцилової кислоти (АСК) як «золотого стандарту» вторинної профілактики інсультів, поширеність резистентності до неї варіює від 5% до 65%.

Мета. Визначити провідні патогенетичні чинники виникнення повторних ішемічних подій у пацієнтів із атеротромботичним інсультом (АІ) на тлі стандартної вторинної профілактики та науково обґрунтувати алгоритм вибору персоналізованої антитромбоцитарної терапії залежно від індивідуальної чутливості до антиагрегантів.

Матеріали та методи. Проведено клініко-неврологічне обстеження 200 пацієнтів (116 чоловіків, 84 жінки; середній вік 60,4 ± 7,4 років) у відновному періоді АІ. Проводилося СКТ/МРТ головного мозку, УЗД екстракраніальних судин, ЕхоКГ та 72-годинне холтерівське моніторування ЕКГ. Функціональну активність тромбоцитів досліджували методом оптичної агрегатометрії з індуктором адреналіном. АР верифікували за умови перевищення ступеня агрегації > 60%. Контрольна група – 50 практично здорових осіб. Статистичний аналіз виконано в STATISTICA 8.0.

Результати. Протягом року спостереження на тлі стандартної терапії (АСК, статини, гіпотензивні, цукрознижуючі засоби) рецидив ішемічного інсульту зафіксовано у 52 пацієнтів (26,0%). У 7,69% випадків (n = 4) причиною повторної катастрофи стала трансформація патогенетичного підтипу інсульту з атеротромботичного на кардіоемболічний внаслідок виявленої пароксизмальної фібриляції передсердь. Серед решти 48 осіб із підтвердженим атеротромботичним генезом рецидиву, АР підтверджена у 47,9% випадків (n = 23), при цьому ступінь агрегації тромбоцитів становила 85,4 [75,1; 97,2] %, що у 2,01 раза перевищувала показники контролю (p < 0,01). Виявлена АР обумовила перегляд антитромботичної стратегії та перехід із АСК на клопідогрель (75 мг/добу).

Висновки. Основним чинником неефективності стандартної вторинної профілактики у 47,9% пацієнтів із рецидивом АІ є лабораторна резистентність до АСК, що диктує необхідність проведення рутинної агрегатометрії. Верифікація АР є підставою для корекції терапії шляхом заміни АСК на клопідогрель, що забезпечує стабілізацію тромбоцитарного гемостазу через альтернативний біохімічний механізм.

Ключові слова: **атеротромботичний інсульт, повторний інсульт, аспіринорезистентність, аспірин, клопідогрель**

Received: 05.05.2026
Accepted: 02.07.2026
Published: 11.09.2026