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A case report of a hemorrhagic stroke with atrial fibrillation in combination with hypertension

Abstract. Background. Stroke is a heterogeneous syndrome, and identification of risk factors and treatment depends on the specific pathogenesis of the disease. Cardiovascular diseases are risk factors for the development of acute disorders of cerebral circulation. According to recent studies, one third of all ischemic strokes are cardioembolic. The main pathoetiology of a hemorrhagic stroke in the form of intracerebral hemorrhages is chronic hypertension and cerebral amyloid angiopathy. The occurrence of a hemorrhagic stroke against the background of atrial fibrillation in combination with hypertension is a rather rare phenomenon and poses a problem in the choice of treatment for such patients. The aim was to determine the optimal treatment for a complex case of a hemorrhagic stroke with atrial fibrillation in combination with hypertension. Materials and methods. We present the clinical case of an 84-year-old woman who developed a hemorrhagic stroke on the background of atrial fibrillation in combination with hypertension. On the one hand, the patient had indications for their administration according to current clinical guidelines (CHA2DS2-VASc score of 6 points); on the other hand, the presence of a hemorrhagic stroke is a contraindication. Results. This case demonstrates the solution to the difficult issue of choosing treatment for a hemorrhagic stroke and prevention of secondary complications of atrial fibrillation in combination with hypertension. After medical cardioversion, using clinical recommendations for the treatment of a hemorrhagic stroke, as well as given the positive dynamics of the neurological status, the patient was prescribed apixaban at a dose of 2.5 mg twice a day under the control of a coagulogram from the 7th day of the disease onset. Conclusions. We believe it is necessary to perform a thorough neurological examination and assessment of cognitive functions in all patients with atrial fibrillation, as well as to consider neuroimaging prior to the prescription of anticoagulant therapy. We recommend considering the administration of oral anticoagulants to patients with a low risk of recurrence and a high risk of thromboembolic complications after intracerebral hemorrhage.

Keywords: intracerebral hemorrhage; arrhythmia; hypertension; diagnosis; treatment

Introduction
Stoke is a heterogeneous syndrome, and the definition of risk factors and treatment depend on its specific pathogenesis [1, 3]. Cardiovascular diseases are risk factors for the development of acute disorders of cerebral circulation. According to recent studies, one third of all ischemic strokes are cardioembolic, and the percentage of strokes considered to be cardioembolic increased from 22.8% in 2002–2005 to 54.3% in 2009–2012 [2].

The main pathoetiology of a hemorrhagic stroke in the form of intracerebral hemorrhages (ICH) is chronic hypertension and cerebral amyloid angiopathy [3].

Atrial fibrillation (AF) and hypertension often coexist. Their frequency increases with age, and they are one of the mortality causes. There has been a discussion in clinical research and determination of the relationship between these two diseases for a long time. Left ventricular hypertrophy and left atrial remodeling in hypertension contribute to the...
development of atrial fibrillation. AF with hypertension in-
creases the risk of thromboembolic complications and heart
failure [4].

The occurrence of a hemorrhagic stroke against the
background of AF in combination with hypertension is a
rather rare phenomenon and poses a problem in the choice
of treatment for such patients. Patients with atrial fibrilla-
 tion who require anticoagulation in the setting of ICH are
controversial, and the decision to resume anticoagulation is
the subject of active research.

In the presented clinical case, we explain the tactics of a
complex diagnostic treatment.

Case report

Information about the patient

An 84-year-old patient after physical overload, against
the background of blood pressure of 170/100 mmHg, de-
veloped an attack of dizziness, accompanied by a single
vomiting, which did not bring relief. After verticalization and
trying to walk, the patient lost consciousness, which lasted
up to 10 minutes, without convulsions. The emergency med-
ical team performed an ECG study and, with suspicion of
atrial fibrillation, recommended hospitalization for further
diagnosis and selection of treatment. The patient’s medical
history includes treatment of hypertension with telmisartan
40 mg once daily and aspirin 100 mg daily.

Clinical data and diagnostic assessment

During examination in the clinic, the patient showed
BMI 23.5 kg/m², blood pressure 170/90 mmHg, heart rate
110 beats per minute (irregular), respiratory rate 25 per mi-

The restoration of the patient’s sinus rhythm occurred 36
hours after the prescription of medical cardioversion. ECG: sinus rhythm, ventricular extrasystole, diffuse repolarization
abnormalities.

During physical examination after 14 days, the patient
showed BMI 23.5 kg/m², blood pressure 125/70 mmHg, 
heart rate 85 beats per minute, respiratory rate 21 per mi-

ume of 27 × 26 × 20 mm with moderate perifocal edema and
fourth ventricle compression in the right hemisphere of the
cerebellum. No midline shift was found. The ventricles of
the brain were not dilated. We determined a pronounced
uneven decrease in periventricular white matter. Convexial
subarachnoid spaces were slightly diffusely expanded. Bone
destructive changes were not determined (Fig. 1).

Clinical analyses of blood and urine revealed no patho-
logical changes. Biochemical blood test showed: blood glu-
cose 6.0 mmol/l, glycosylated hemoglobin 6.18 %, chole-
sterol 6.6 mmol/l, LDL 5.1 mmol/l, HDL 0.54 mmol/l, tri-
glycerides 2.3 mmol/l, AST 35 units/l, ALT 34 units/l, total
bilirubin 9.1 mmol/l, creatinine 70 μmol/l, urea 3.7 mmol/l,
total protein 71 g/l, K 4.1 mmol/l, Na 135 mmol/l.

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Therapeutic intervention

To restore sinus rhythm during atrial fibrillation, we pre-
scribed propafenone 150 mg every 2 hours (up to 600 mg
day). The main issue the cardio-neurological team faced
was the administration of oral anticoagulants. On the one
hand, the patient had indications for their use according to
current clinical guidelines (CHA₂DS₂-VAsc score 6 points);
on the other hand, the presence of a hemorrhagic stroke is a
contraindication [5].

Using clinical recommendations for the treatment of
hemorrhagic stroke [6], as well as given the positive dyna-

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Coagulogram: PT 11 sec, PI 111 %, TT 14 sec, fibrino-
gen 4.1 g/l, aPTT 25 sec, INR 0.8 units.

ECG on admission: atrial fibrillation was detected (ab-

ence of P waves, presence of f waves between QRS).

Echocardiography data: cardioclasis, arrhythmia, in-
tertrial septal aneurysm of 2 cm, patent foramen ovale with a
diameter of 4–5 mm and right-to-left shunting. There is no pulmonary hypertension. Dilatation of the left and right
atrium. Mitral valve prolapses of the first degree. Regurgi-
tation of mitral, aortic, tricuspid valves +. Left ventricular
hypertrophy. Ascending aorta dilatation. Pleurisy and peri-
carditis are absent. Ejection fraction is 65 %.

An atherosclerotic plaque and a 30% stenosis were found
on the back wall of the left common carotid artery during
ultrasound examination of extra- and intracranial vessels.

During the CT scan of the brain, we visualized a hema-
toma of 27 × 26 × 20 mm with moderate perifocal edema and
fourth ventricle compression in the right hemisphere of the
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Further observations and results

The restoration of the patient’s sinus rhythm occurred 36
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5.72 mmol/l, total protein 73.7 g/l, K 4.47 mmol/l, Na 139 mmol/l.

Coagulogram: PT 17.3 sec, PI 95 %, TT 20.1 sec, fibrinogen 2.0 g/l, aPTT 36 sec, INR 1.8 units.

The patient refused to repeat the CT scan of the brain.

After restoring sinus rhythm, the patient was prescribed bisoprolol 10 mg once a day under heart rate control. The patient continued to take hypolipidemic and neuroprotective therapy, keeping a hypolipidemic diet.

Discussion

AF is a frequent cause of strokes and thromboembolism. The risk of death, disability, and stroke recurrences is higher with strokes on the background of AF than with strokes of other etiology. The algorithm for managing a patient with AF is complex, so the European Society of Cardiology 2024 focuses on the ABC route, where A is avoid stroke with anticoagulation; B — better symptoms control; C — cardiovascular risk factors and comorbidities management.

The action plan of the studied drug is “A” focus, that is, a strategy in prevention of stroke and thromboembolism. Therefore, considering anticoagulation in a patient, we should begin with assessing the risk of stroke/thromboembolism and the use of appropriate anticoagulants, the primary goal of which is to reduce the risk of stroke and systemic embolism [5]. Clinically, the CHA$_2$DS$_2$-VASc score is commonly used to estimate the annual risk of ischemic stroke in a patient with atrial fibrillation.
fibrillation and to determine whether anticoagulation is indicated [6].

However, the occurrence of a hemorrhagic stroke against the background of AF poses new challenges for doctors in choosing treatment for such patients.

Insufficiently controlled hypertension increases the risk of stroke by 2–4 times. Chronic hypertension is the main cause of ICH in patients under 70 years of age. High blood pressure causes vascular remodeling at the cellular level, leading to lipohyalinosis and true arterial dissection (Charcot–Bouchard aneurysms), which rupture and promote extravasation of high-pressure blood into the brain parenchyma. Bleeding against the background of hypertension occurs in deep structures of the brain, which are supplied with blood by small vessels, including the thalamus, pons, and cerebellum [4].

The question of whether and when antiplatelet therapy should be resumed after ICH, especially in patients at high risk of developing ischemic stroke, remains a subject of much debate. The RESTART randomized trial investigated the safety of resuming antiplatelet therapy after a stroke and found that the risk of recurrent stroke was probably too small to outweigh the benefits of antiplatelet therapy in patients requiring it for secondary stroke prevention [7].

Patients with atrial fibrillation who require anticoagulation in the setting of ICH are controversial, and the decision to resume anticoagulation is the subject of active research [8, 10].

One of the studies on the use of anticoagulants after ICH [9] has found that individuals who had lobar ICH with atrial fibrillation should not be offered long-term anticoagulation therapy. However, patients with non-lobar ICH and a particularly high risk of thromboembolic stroke or a low risk of recurrent ICH may undergo long-term anticoagulation.

In contrast to this study, several population-based and cohort studies have shown a reduced risk of thromboembolic events and lower mortality in patients who continued oral anticoagulants after ICH, with only one study showing a high risk of recurrent ICH [4].

Two recent meta-analyses have found a lower risk of thromboembolic events, including ischemic stroke, and no increased risk of ICH in patients taking anticoagulants [10].

These results emphasize the need for re-initiation of anticoagulants after ICH.

Conclusions

We believe that it is necessary to perform a thorough neurological examination and assessment of cognitive functions in all patients with AF, as well as consider neuroimaging prior to the prescription of anticoagulant therapy. We recommend considering the administration of oral anticoagulants in patients with a low risk of recurrence and a high risk of thromboembolic complications after ICH.

References


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Звіт про випадок геморагічного інсульту на тлі фібриляції передсердь у поєднанні з гіпертонічною хворобою

Резюме. Актуальність. Інсульт є гетерогенним синдромом, і визначення факторів ризику та лікування залежить від його патогенезу. Відомо, що захворювання серцево-судинної системи є факторами ризику розвитку гострих порушень мозкового кровообігу. Згідно з останніми дослідженнями, третина всіх ішемічних інсультів є кардіоемболічними. Фібриляція передсердь та гіпертензія часто співіснують, підвищуючи ризик тромбоемболічних ускладнень і серцевої недостатності. Основною ж патоетіологією геморагічного інсульту у вигляді внутрішньомозкових крововиливів є хронічна гіпертензія та церебральна амілоїдна ангіопатія. Виникнення геморагічного інсульту на тлі фібриляції передсердь у поєднанні з артеріальною гіпертензією є досить рідкісним явищем і створює проблему у виборі стратегії лікування геморагічного інсульту й профілактики вторинних ускладнень фібриляції передсердь у поєднанні з артеріальною гіпертензією.

Метою дослідження було визначення оптимальної тактики лікування складного випадку геморагічного інсульту на тлі фібриляції передсердь у поєднанні з гіпертонічною хворобою. Матеріали та методи. Ми представляємо клінічний випадок геморагічного інсульту, що розвинувся у 84-річної жінки на тлі фібриляції передсердь у поєднанні з гіпертонічною хворобою. Основним питанням, яке постало перед кардіоневрологічною командою, було приєднання пероральних антикоагулянтів. З одного боку, пацієнток мала показання до їхнього призначення згідно з чинними клінічними настановами (оцінка за шкалою CHA²DS²-VASc 6 балів), з іншого боку, наявність геморагічного інсульту є протипоказанням. Результати. Цей випадок демонструє вирішення складного питання щодо вибору тактики лікування геморагічного інсульту й профілактики вторинних ускладнень фібриляції передсердь у поєднанні з артеріальною гіпертензією. Після проведення медикаментозної кардіоверсії з огляду на клінічні рекомендації щодо лікування геморагічного інсульту, а також позитивну динаміку неврологічного статусу пацієнтки було припинено антикоагулянтну терапію. Висновки. Ми вважаємо, що необхідно ретельно проводити неврологічний огляд та оцінку когнітивних функцій усіх пацієнтів із фібриляцією передсердь, а також розглядати виконання нейровізуалізації для призначення антикоагулянтної терапії.

Ключові слова: внутрішньомозковий крововилив; аритмія; гіпертонічна хвороба; діагностика; лікування