НАУЧНА ДЕЙНОСТ
НА Д-Р МАЯ ПЕНКОВА ДАНОВСКА-МЛАДЕНОВА, ДМ
РЕЗЮМЕТА

НАУЧНАТА ДЕЙНОСТ, СВЪРЗАНА С ДОКТОРСКАТА ДИСЕРТАЦИЯ

Списък с отпечатани публикации

1. **Дановска М**. Про/антиоксидантен статус на кръвта на болни с остър паренхимен мозъчен кръвоизлив-възможна връзка с неврологичния дефицит и клиничен изход [автореферат]. Варна: Медицински Университет – Варна; 2012.

ANNOTATION

Spontaneous intracerebral hemorrhage (sICH) accounts for only 15-20% of all strokes, but is the cause of severe disability and is associated with the highest mortality rate. Despite the increasing stroke incidence sICH still remains an unsolved medical problem. Growing evidence suggests that inflammation and oxidative stress play a crucial role in the pathogenesis of sICH.

Objective: The aim of the present study was to evaluate pro/antioxidant changes in the blood of patients with acute sICH. The hypothesis was that the pro/antioxidant changes following sICH onset are reliable indicators of the brain damage and could serve as prognostic markers of the neurological deficit and clinical outcome.

Case material and methods: To test the hypothesis 171 patients were studied: 101 with sICH, 19 with vascular risk factors and 51 age-matched healthy controls.

Results: Leukocyte count, neutrophils and fibrinogen were found significantly increased in patients with sICH. Furthermore, they correlated with the neurological deficit severity and the clinical outcome. Serum CRP level correlated with the neurological state and hematoma volume. Some antioxidant parameters, TAS and ROOH were also found correlated with the neurological state and functional outcome. The impact of some modifiable risk factors, comorbidities and concomitant medication was also assessed. It was found that alcohol abuse and baseline hyperglycemia were associated with poor outcome while previous treatment with ACE-inhibitors and statins improved the functional outcome after sICH.

Binary logistic regression was used to assess the predictive value of the pro/antioxidant changes in the blood of patients with sICH. We found that serum CRP level and hematoma volume were significant predictors of short-term mortality in sICH while serum ROOH concentration predicted poor outcome in sICH survivors. What is more, patients with sICH and serum CRP level > 22.4 mg/l had significantly lower chance to survive regardless of their age and sex.

Conclusion: On the base of the study results we can conclude that pro/antioxidant changes in the blood of patients with sICH are important indicators of the neurological deficit severity that could serve as additional laboratory markers of the clinical outcome after sICH.

The present study elucidates the important role of the pro/antioxidant changes in the acute stage of sICH thus enriching the basic and clinical knowledge. The study results show that some nonspecific

markers – inflammatory and oxidative, that are easily measured, could serve as additional diagnostic and prognostic tool, thus providing an excellent opportunity for therapeutic interventions while the patient is still in clinic. We also recommend the routine evaluation of serum CRP level as early independent predictor of sICH outcome.

Публикации в чуждестранни научни списания

2. Alexandrova M**, Danovska M**. Serum C-reactive protein and lipid hydroperoxides in predicting short-term clinical outcome after spontaneous intracerebral hemorrhage. *Journal of Clinical Neurosciences*. 18 (2011) 247-252. **(IF 1.247; инд. IF 0.624; 6 цитирания)**.

Summary

There is no effective treatment for spontaneous intracerebral hemorrhage (sICH). We examined 46 patients with sICH within 48 hours after onset of symptoms, aiming to assess the predictive value of C-reactive protein (CRP) and lipid hydroperoxides (ROOH) on ‘‘first-week mortality’’ and ‘‘clinical outcome at discharge’’ by binary logistic regression. We found that serum CRP and hematoma volume were predictors of short-term mortality. Although serum ROOH level was positively correlated with mortality, it did not predict early lethal outcome. Serum ROOH concentration, however, was a predictor of poor clinical outcome in sICH survivors. After confirmation of the results obtained through observing a larger group of patients, an oxidative stress marker could be used as an additional criterion for patient stratification, especially when severe disability is expected and supplementary therapeutic approaches are urgent.

Keywords: Circulation, C-reactive protein, Hemorrhagic stroke, Lipid hydroperoxides, Oxidative stress, Short-term prognosis

Публикации в научни списания в България

3. Александрова М, Бочев П, Стаменов Б, **Дановска М**, Маркова В. Антиоксидантен статус на кръвта при пациенти с остър хеморагичен инсулт. *Trakia Journal of Sciences*, 2005, vol.3, pp 49-52.

Abstract

The aim of the present work was to measure some components of the antioxidant blood potential in patients with severe hemorrhagic stroke in the acute stage. The blood catalase activity, the activity of erythrocyte superoxide dismutase and the total concentration of blood thiol groups were evaluated. The results showed that the total blood catalase activity (p=0.008) and the concentration of blood thiol groups (p=0.020) of the patients were significantly increased. The erythrocyte superoxide activity was decreased (p=0.013).

Future investigations are expected to show whether these parameters could be employed as additional criteria of hemorrhagic stroke severity and outcome.

Key words: free radical processes, antioxidants, hemorrhagic stroke, blood.

4. **Danovska M**, Alexandrova M, Bochev P, Stamenov B. C-reactive protein – an indicator of clinical outcome and recovery in patients after spontaneous intracerebral hemorrhage. *Trakia Journal of Sciences.* 2008: 6(2); 65-67.

Abstract

The aim of the present study was to measure the C-reactive protein (CRP) plasma levels in patients with spontaneous intarcerebral hemorrhage in acute stage. The CRP testing was performed by a semi-quantitative method of RANDOX. A positive correlation between CRP levels and stroke outcome assessed according to the modified Rankin Scale was established. Thus, CRP plasma levels may be used as an additional predictor of clinical outcome prognosis.

Key words: Spontaneous intracerebral hemorrhage, C-reactive protein, Prognosis.

5. Alexandrova M**, Danovska M**, Gencheva I, Garjarian S. Low serum total antioxidant status may reflect the severity of neurological impairment in patients after spontaneous intracerebral hemorrhage. *SCIENCE & TECHNOLOGIES* 2011, 1(1): 39-44.

Abstract

The purpose of this study was to explore the relationship between the serum total antioxidant status (TAS) and the severity of neurological deficit in patients with acute spontaneous intracerebral hemorrhage (sICH). It was found that TAS correlated with the severity of neurological impairment, evaluated by both the NIHSS and the Mathew Stroke Scale. Furthermore, the parameter had the lowest values in patients who died, and the highest values were found in the group of patients who made *a good recovery* according to the Glasgow Outcome Scale. Future studies should show whether TAS may serve as a reliable predictor of outcome after sICH.

Key words: spontaneous intracerebral hemorrhage, oxidative stress, total antioxidant status, peripheral blood.

Публикации в рецензирани научни сборници на научни звена или доклади от научни прояви, разписани в пълен текст с книгопис и резюме на английски език

6. **Дановска М**, Александрова М, Попова М, Симеонова В. Рискови фактори за мозъчен инсулт - възможна връзка с протичащи свободно-радикални процеси. *Сборник от научна конференция с международно участие, Стара Загора*, 2004;4(2):70-76.

Abstract

Regardless of the progress in diagnostics and treatment of stroke patients, the best approach remains primary prophylaxis. In the present review, the basic modified risk factors of stroke in the context of the running processes of free radical generation and lipid peroxidation are considered.

The extensive study of risk factors may help to prevent stroke and may precise therapy. The control of risk factors, combined with the use of medicaments neutralizing free radicals may reduce the incidence of cerebral vascular accidents.

Key words: stroke, risk factors, free radicals, lipid peroxidation.

Резюмета от участия в научни прояви в чужбина

7. **Danovska M,** Alexandrova M, Stamenov B. Plasma c-reactive protein and cognitive impairment in ischemic stroke patients. *6-th International Congress on Vascular Dementia*, Barcelona, Spain, 19-22.11.2009, 136.

Abstract

The purpose of our study is to investigate the correlation between hs-CRP (high sensitive C-reactive protein) plasma level and cognitive functions of patients with acute ischemic stroke (mRankin scale<4). We examined 41 patients with mild to moderate acute ischemic stroke treated in Second Neurology Clinic, UMHAT Pleven, Bulgaria. Global cognitive functions of the patients were assessed at baseline and a year later with Mini Mental State Examination and their neurological deficit was assessed using NIHSS. Our results show that 63.4% from the patients examined at baseline were at risk of developing dementia and 36.6% had mild to moderate dementia. In a year from the ischemic stroke, the latter increased to 68.4%. We established that age, education and plasma hs-CRP level correlate with the cognitive status of the patients. Even more, plasma hs-CRP predicts cognitive decline at admission, while age predicts cognitive deterioration in a year from the ischemic stroke.

In conclusion, our results indicate the significant influence of inflammation on the cognitive impairment in ischemic stroke patients.

Резюмета от участия в научни прояви в България

8. **Danovska M,** Stamenov B, Andreev T, Stoev P, Valkova M, Stefanovski P **.** Correlative clinical and neuroimaging studies in patients with acute spontaneous intracerebral hemorrhage. 16-th World Neurosonology Meeting of the EFN Sofia, October 17-20, 2013, *Neurosonology and Cerebral Hemodynamics* 2013 9:2; p 113 ISSN 1312-6431.

Abstract

Objective: To assess the prognostic value of some clinical, ultrasound and neuroradiological parameters on the 30-th day clinical outcome of patients with acute spontaneous intracerebral hemorrhage (sICH).

Material and Methods: We examined 88 patients with sICH admitted to the Neurology clinic of UMHAT “Dr Georgi Stranski”, Pleven within 48 hours after the symptoms onset. The neurological deficit was assessed by the Glasgow Coma Scale (GCS) and National Institute of Health Stroke Scale (NIHSS) on admission. Clinical outcome on the 30-th day of sICH was evaluated by the Glasgow Outcome Scale (GOS) and modified Rankin Scale (mRS). Hemorrhage volume was measured on computed tomography (CT) by a simplified formula for the volume of an ellipsoid, (AxBxC)/2. All the patients underwent ultrasound examination of the carotid arteries. The statistical analysis was performed with the Statistical Package for Social Sciences version 19.0 (SPSS) and Statgraphics plus 4.1 for Windows.

Results: We found that neurological deficit assessed on admission by GCS and NIHSS, hematoma volume and location are significantly correlated with the clinical outcome on the 30-th day of the sICH onset. Age, vascular risk factors and ultrasound parameters were not significant factors for the clinical outcome. Male patients had better outcome on the 30-th day as compared with the female ones.

Discussion: GCS and NIHSS scores on admission, hematoma volume and location are reliable predictors of clinical outcome on the 30-th day of the sICH that could be used for patient stratification and optimization of the individual therapeutic approach.

Key words: neuroimaging, outcome, sICH.

9. **Danovska M,** M. Alexandrova, I. Gencheva Disturbed equilibrium between pro-oxidants and antioxidants in metabolic syndrome patients. 18th Session of the Balkan Medical Days 16-18 Sept 2011, Varna, Bulgaria, 2011: 56.

Abstract

Patients with metabolic syndrome are at high risk of cerebrovascular and cardiovascular morbidity and mortality. Oxidative stress plays a crucial role in the pathophysiology of the metabolic syndrome, but little is known about the antioxidant activities of patients with metabolic syndrome. The objective of the study was to analyze some markers of oxidative stress and antioxidant activities in patients with metabolic syndrome.

We examined 19 (8 male and 11 female) patients with metabolic syndrome, median age 61 years, 18 healthy age-matched controls (7 male and 11 female). Serum GPx1 concentration (p=0.001) and TAS (p=0.000) were found to be significantly lower and serum MDA concentration (p=0.002) was found to be significantly higher in patients with metabolic syndrome than in control subjects.

Our results demonstrate changes in the pro/antioxidant activities of patients with metabolic syndrome which may contribute to the progression of atherosclerosis and its complications as stroke and myocardial infarction. Knowing the complex functional interrelationship between the metabolic syndrome and pro/antioxidant mechanisms may help achieve primary prophylaxis of cerebrovascular and cardiovascular events. Future studies should address the therapeutic potential of antioxidant supplements for successful vascular protection in high risk patients.

Key words: metabolic syndrome, stroke, oxidative stress, antioxidant activities.

10. **Дановска М**, Александрова М, Стаменов Б, Бочев Б, Маркова В. Оценка на антиоксидантния статус на кръвта и нивото на липидна пероксидация при болни с остър хеморагичен инсулт. *IX Национален конгрес по неврология с международно участие с международно участие*, София, Българска Неврология, 2005, 5 (4): 221.

Резюме

Цел на настоящето проучване е изследването на компоненти от антиоксидантния потенциал на кръвта и показатели за нивото на оксидативно увреждане в плазмата и кръвта на болни след прекаран хеморагичен инсулт.

За целта е проведен анализ на активността на супероксид-дисмутаза в еритроцити, каталазната и глутатион-пероксидазната активности на кръвта и общото съдържание на сулфхидрилни групи в кръвта. Изследвани са концентрацията на липидните хидропероксиди в плазмата на пациентите и нивото на реактивните съединения на тиобарбитуровата киселина в кръвта. Проучването включва 11 болни с остър хеморагичен инсулт и 19 здрави лица.

Резултатите показват, че при болните е увеличена каталазната активност на кръвта и общото ниво на сулфхидрилни групи в кръвта. Няма значима промяна в активността на глутатион-пероксидазата и супероксид-дисмутазата. Наблюдава се тенденция към снижаване нивото на някои продукти на липидната пероксидация.

Получените резултати сочат възможно участие на свободно-радикални процеси в патофизиологичните механизми на хеморагичния инсулт. Очаква се продължаващите разследвания да изяснят ролята на оксидативно-медиираните промени на кръвта при хеморагичен инсулт и да предложат възможности за невропротективно лечение.

Ключови думи: хеморагичен инсулт, активни форми на кислорода, липидна пероксидация, антиоксиданти.

11. Александрова М, Бочев П, Маркова В**, Дановска М**, Симеонова В. Периферни левкоцити и редокс-баланс на кръвта при болни с остър хеморагичен инсулт- предварителни резултати. *Юбилейна научна конференция 30 години ВМИ - Плевен,* 2004, Сборник резюмета, 208.

Резюме

Предполага се , че патофизиологията на паренхимните мозъчни кръвоизливи е свързана с генерация на активни форми на кислорода и процеси на липидна пероксидация.

Целта на настоящето проучване е изследването на редокс-балансът на кръвта на болни след прекаран хеморагичен инсулт и връзката му с клинични показатели. Проведен е мултипараметричен анализ на оксидативна активност на периферните левкоцити и степента на възпалителния отговор, компоненти от антиоксидантния потенциал на кръвта и показатели за нивото на оксидативно увреждане в плазмата на кръвта. Изследвани са 7 болни с остър хеморагичен инсулт и 19 здрави лица.

Предварителните резултати показват, че при болните е увеличен сигнификантно броят на гранулоцитите. Достоверно е снижен броят моноцити и лимфоцити. Наблюдава се тенденция към на намаление на общия холестерол в кръвта на пациентите. Увеличена е скоростта на активиране на периферните фагоцити при стимулация по опсонин-независим механизъм. Увеличението позитивно корелира с нивото на инвалидизиране, оценено по модифицираната скала на Ранкин. Не се наблюдава промяна в стимулирания оксидативен капацитет на левкоцитите за обща и екстрацелуларна продукция на радикали. Установява се увеличение в нивото на някои антиоксиданти. Снижено е нивото на продукти на липидната пероксидация в плазмата и кръвта.

Въз основа на получените предварителни резултати може да се предположи, че хеморагичният инсулт в остър стадий не се съпровожда с праймиране на периферни левкоцити за увеличено образуване на оксиданти. Продължаващите изследвания със значително по-голяма група, вероятно ще позволят да се отговори категорично на въпроса за мястото на редокс-баланса на кръвта в патогенезата на хеморагичния инсулт.

12. Alexandrova M, **Danovska M**, Garjarian S. Significant determinants of cognitive decline in patients one year after ischemic stroke. *VIII-th International Medical Scientific Conference for Students and Young Doctors*, 20-23 October 2010, Pleven, Bulgaria, 91.

Abstract

Aim/Objectives: Growing evidence suggests that the risk of dementia increases after ischemic stroke. However, relatively few studies have been reported on the risk factors of post-stroke cognitive impairment.

Methods: We examined 47 patients (26 males, 21 females) patients with ischemic stroke, aged 56 to 76 years (median age 63), who were admitted to the Department of Neurology, University Hospital – Pleven within 48 hours after onset of symptoms. Computed tomography of the brain was performed on admission. Blood biochemistry analysis was performed using standard laboratory methods. Plasma high sensitive C-reactive protein (hs-CRP) concentration was evaluated by a latex immune turbidity rate method. The National Institute of Health Stroke Scale was used to determine the patients' neurological deficit at discharge. Cognitive function in patients was measured with the Mini Mental State Examination scale at one year post-stroke.

Results: We found that one year after stroke 34% of the patients were at risk for cognitive impairment and 43% of the patients had mild to moderate cognitive deficit. Age (p=0.0001), level of

education (p=0.0004), sex (p=0.041), history of diabetes (p=0.045) and hs-CRP concentration on admission (p=0.003) were significant determinants of cognitive decline at one year post-stroke.
Conclusion: Suppression of inflammation in ischemic stroke patients, especially among older adults with concomitant diabetes, may prove effective in preventing or delaying the occurance of cognitive impairment. The role of inflammation in post-stroke cognitive disturbances deserves attention in large prospective studies.
Key words: ischemic stroke, cognitive decline, inflammation.

НАУЧНАТА ДЕЙНОСТ, НЕСВЪРЗАНА С ДОКТОРСКАТА ДИСЕРТАЦИЯ

Публикации в чуждестранни научни списания

13. Alexandrova M, Bochev P, Markova V, Bechev B, Popova M, **Danovska M**, Simeonova V. Changes in phagocyte activity in patients with ischaemic stroke, *Luminescence*, 2001;16:357-365 **(IF 1.111; инд. IF 0.159; 7 цитирания)**.

Abstract

The activity of peripheral phagocytes to generate reactive oxygen species (ROS) was studied in healthy individuals and patients with ischaemic stroke. The aim was to clarify the relationship between phagocyte activity, the time elapsed after the onset of disease and stroke severity. The total and extracellular production of ROS were evaluated by luminol chemiluminescence. Simultaneously the plasma oxidant activity was determined. When stimulated by opsonized zymosan, phagocytes in patients with stroke (regardless of its severity) showed fast activation. The total ROS generation increased over time in all stroke cases studied. However, the extracellular ROS generation was found to be greater in patients with severe stroke than in those with mild neurological deficiency. When stimulated by formyl-methionyl-leucyl-phenylalanine, the total oxidative phagocyte capacity (regardless of stroke severity) increased over time, but there was no change in the amount of extracellularly generated ROS. In patients with stroke the oxidant activity of plasma was enhanced. We conclude that circulating phagocytes in patients with ischaemic stroke are primed for enhanced ROS production by opsonin receptor-mediated stimulation and for increased secretion of myeloperoxidase by opsonin receptor-independent stimulation. The enhanced extracellular generation of ROS through opsonin receptor-dependent stimulation may be considered an oxidative stress biomarker in cerebral ischaemia.

Key words: blood, phagocytes, ischemic stroke, reactive oxygen species, chemiluminescence.

14. Alexandrova M**,** Bochev P, Markova V, Bechev B, Popova M, **Danovska M**, Simeonova V. Oxidative stress in the chronic phase after stroke, *Redox Report*, 2003;8(3):169-176 **(IF 1.675; инд. IF 0.239; 14 цитирания)**.

Abstract

The spontaneous and the stimulated extracellular generation of reactive oxygen species (ROS) by peripheral phagocytes, the blood antioxidant capacity and the degree of oxidative damage were evaluated in patients with severe ischemic and hemorrhagic stroke in the chronic phase of disease. It was found in patients compared to the control group that: (i) the spontaneous phagocyte oxidative activity was enhanced independently of the type of stroke and the time elapsed after stroke onset; (ii) there was no difference in the extracellular ROS generation stimulated by opsonin-dependent and independent receptor mechanisms; (iii) there was no change in the indices of

blood antioxidantcapacity; (iv) the concentration of plasma lipid peroxides was enhanced regardless of the type of stroke, but it significantly increased over time; and (v) the concentration of blood thiobarbituric acid-reactive material was also enhanced. It was independent of the type of stroke and remained elevated during the whole period studied. We have demonstrated an enhanced spontaneous phagocyte oxidative activity and oxidative damage to lipids in patients in the chronic phase after stroke. The elimination of generated ROS and products of lipid peroxidation from the circulation could prevent the aggravation of chronic vascular injury in patients and could reduce the possibility of a subsequent stroke. This suggests the need for complex therapy, including antioxidant treatment directed to exclude the effects of free radicals, after the oxidative stress of stroke.

15. Alexandrova M, Bochev P, Markova V, Bechev B, Popova M, **Danovska M,** Simeonova V. Dynamics of free radical processes in acute ischemic stroke: influence on neurological status and outcome, *Journal of Clinical Neuroscience*, 2004;11(5):501-506 **(IF 0.834; инд. IF 0.119; 36 цитирания)**.

    Abstract

    The dynamics of free radical processes during the acute stage of ischemic stroke and their relationship with the clinical status of patients were studied. An enhanced extracellular generation of reactive oxygen species (ROS) by peripheral phagocytes was observed in severe stroke patients during the whole acute stage. This generation correlated positively with the size of infarct, the severity of neurological deficit and handicap and correlated negatively with the improvement of the neurological status of patients. An increase in the activity of two enzymes from the antioxidant defense mechanism, catalase and glutathione peroxidase, was registered during the whole acute phase of stroke, regardless of its severity. The concentration of lipid peroxidation products increased over time. Blood concentration of thiobarbituric acid-reactive material (TBARM) correlated positively with the size of infarct, the severity of neurological deficit and handicap. In conclusion, extracellular ROS generation by phagocytes and blood TBARM concentration could be used as indicators for stroke outcome.

    Key words: reactive oxygen species, phagocytes, ischemic stroke, lipid peroxidation, antioxidant enzymes.

16. Alexandrova M, **M. Danovska.** Sustained inflammation after ischemic stroke increases brain susceptibility to long-term cognitive impairment in adults. *In Press-Turkish Journal of Medical Sciences.* 2014 **(IF 0.450; инд. IF 0.225)**.

    Abstract

    Evidence suggests that the risk for dementia increases after stroke.

    Material and methods: We examined 47 ischemic stroke patients admitted within 48 hours of ictus. Their neurological and cognitive status, blood biochemical parameters and microalbuminuria level were prospectively evaluated over a 1-year post stroke.

    Results: A more severe neurological deficit was found in the cognitively impaired patients than in cognitively normal patients (p=0.003). The NIHSS score over a 1-year follow-up period showed improvement only in patients with normal cognition (p=0.000). A time-varying dynamics of MMSE score was observed in both patient groups (p=0.000). Cognition deteriorated within 6 months in the cognitively impaired patients. Age (p=0.000), level of education (p=0.004), gender (p=0.041), history of diabetes (p=0.045) and serum high sensitive C-reactive protein (hs-CRP) concentration on admission (p=0.003) were significant determinants of cognitive decline 1 year after stroke.The patients with cognitive decline had persistently high WBC and granulocyte count. The albumin-to-

creatinine ratio was high during the whole follow-up period in the cognitively impaired group even after adjusting for sex and age (p=0.010). The ordinal logistic regression analysis showed that hs-CRP (p=0.005) and age p=0.000) were independent predictors of patients' cognitive status, represented as a three-level ordinal scale.

Conclusion: The level of inflammatory markers could be considered as an additional criterion of long-term cognitive impairment.

Key words: Cognitive Impairment, hs-CRP, Ischemic Stroke, Long-Term Prognosis, Ordinal Logistic Regression.

Публикации в научни списания в България

17. Peichinska D, **Danovska M,** Chakarov D, Simeonova V, Lilovski Chr. Dynamic follow up of aphasic disorders in patients with ischemic stroke in acute stage. *Journal of IMAB*- Annual proceeding (Scientific papers), 2004, 1:19-21. DOI: 10.5272/jimab.2004101.19.

Abstract

The dynamic follow up of aphasic disorders in patients with acute ischemic stroke is of great importance because of its prognostic value for their future recovery. The purpose of that clinical study is to compare the

type of aphasia with the CT data about the infarction localization and to evaluate the prospective aphasia recovery. In the clinical study were included 37 patients with ischemic stroke and aphasia, theated in II-nd Neurology Clinic, Medical University Pleven. The diagnosis ischemic stroke was confirmed by clinical and CT investigations. Partial and full recovery of sensory aphasia was registered in all the patients with total aphasia, while motor aphasia showed little tendency of reduction in acute ischemic stroke. Aphasic disorders were more severe in cases with ischemic infarctions localized in the specific anatomical regions responsible for the speech function. The dynamic follow up of aphasic disorders has prognostic value for the speech recovery. Better prognosis show sensory and amnestic aphasia. Lesion localization also influences the prognosis.

Key words: ischemic infarction, aphasia, prognosis.

18. **Дановска М,** Александрова М. Възпалителни механизми след интрацеребрален кръвоизлив. *Българска Неврология* 2010: 10(2); 58-64.

Abstract

Intracerebral hemorrhage (ICH) is a medical problem of great social significance characterized by high rates of morbidity and mortality among the adult population. Despite the remarkable advances in modern diagnostics of cerebrovascular events, there is still no effective treatment of that devastating disease. Recently, experimental and clinical evidence has been accumulated indicating the importance of inflammation in the progression of ICH-induced brain damage. The present article reviews the role of local and systemic inflammation in the pathogenesis and clinical outcome after ICH. A better understanding of the complex pathophysiological mechanisms triggered by ICH and the role of biochemical markers associated with inflammation may provide additional opportunities to improve functional outcome, reduce mortality and develop new therapeutic strategies.

Key words: Intracerebral Hemorrhage, Inflammation, Cytokines, Brain Edema, Oxidative Stress, Apoptosis.

19. **Danovska M,** Alexandrova M, Peychinska D, Gencheva I. Alcohol abuse enhances systemic inflammatory response in patients after spontaneous

intracerebral hemorrhage. *Journal of IMAB-Annual proceeding* (Scientific papers), 2010: 16(3); 27-31; DOI: 10.5272/jimab.1632010_27-31.

Abstract

Objective: The role of inflammation in the complex pathophysiology of spontaneous intracerebral hemorrhage (sICH) was studied by assessing the relationship between serum C-reactive protein (CRP) levels and some clinical and neuroradiological parameters. We also aimed to identify the effects of modifiable vascular risk factors on serum CRP levels.

Patients: Forty six patients with sICH admitted to the Department of Neurology and Neurosurgery of the Pleven University Hospital, Bulgaria were examined. Serum CRP levels were measured within the first 48 hours of disease onset and analyzed in relation to neurological deficit severity and clinical outcome after sICH. The impact of some vascular risk factors on the inflammatory marker levels was also studied.

Results: We found enhanced CRP levels in patients with severe neurological deficit as assessed by the National Institutes of Health Stroke Scale (NIHSS) score. Significantly higher CRP levels were measured in patients with progressive clinical deterioration and worse outcome. Serum CRP levels were also higher in patients with a history of alcohol abuse.

Conclusions: Our results suggest that inflammation plays a crucial role in the development of brain injury after sICH. They show that CRP, a nonspecific inflammatory marker, can serve as an additional diagnostic and prognostic test indicator in the acute stage of sICH thus providing an excellent opportunity for therapeutic interventions while the patient is still in clinic. Patients with a history of systemic alcohol abuse demonstrate stronger inflammatory response indicative for worse prognosis.

Key words: Intracerebral hemorrhage, inflammation, CRP, alcohol abuse, arterial hypertension.

20. Valkova, B. Stamenov, D. Peychinska, **M. Danovska**. Cognitive dysfunctions in diabetic polyneuropathy. *Journal of IMAB* - Annual proceedings (Scientific papers) 2011, vol.17, book1: 183-189.DOI: 10.5272/jimab.2011171.183.

Abstract

Introduction: The objective of our study was to examine cognitive status, short – term memory, delayed recall and the retention of visual information in diabetics with polyneuropathy and to establish the impacts of some risk factors on cognitive performance.

Contingent and methods: We assessed 47 diabetic patients with polyneuropathy, using the Mini Mental State Examination, 10 words test, the Benton visual retention test and the Hamilton scale.

Results: Global cognitive dysfunction, decline in verbal memory and visual retention and tendency for depressive mood were observed. We found statistically significant interaction of ageing, sex, severity of pain, duration and late onset of diabetes mellitus (DM) on cognitive functioning. Therapy association on cognition was not found.

Conclusions: Our study confirms the hypothesis of global cognitive dysfunction, associated with diabetic polyneuropathy. The interactions of sex and pain severity require further study. We arise a hypothesis of asymmetrical brain injury in diabetics.

Key words: diabetic polyneuropathy, global cognitive functioning, retention of visual information, verbal memory.

21. **Дановска М**, Александрова М**.** Ефект на хипергликемията върху клиничния изход от спонтанен интрацеребрален кръвоизлив. *SCIENCE & TECHNOLOGIES,* 2011, 1(1):145-149.

Abstract

Hyperglycemia is a common finding after spontaneous intracerebral hemorrhage (sICH) that may worsen prognosis. We studied 42 sICH patients, mean age 65±11 years, within 48 hours of onset. Admission blood glucose (BG) and other biochemical parameters were measured using standard laboratory methods. The functional outcome of patients was assessed by both the modified Rankin Scale (mRS) and the Glasgow Outcome Scale (GOS). We found that hyperglycemia was associated with sICH outcome (mRS - $\chi^2 = 10.510$; $p = 0.028$; GOS - $\chi^2 = 8.491$, $p = 0.012$). The results suggest that hyperglycemia plays a detrimental role in sICH. Further studies should confirm the benefits of tight glycemic control in acute sICH.

Key words: hyperglycemia, spontaneous intracerebral hemorrhage, blood glucose, clinical outcome.

22. **Danovska M,** Stamenov B., Alexandrova M, Peichinska D. Post-stroke cognitive impairment-phenomenology and prognostic factors. *Journal of IMAB - Annual Proceeding (Scientific Papers)* 2012, vol. 18, book 3, 290-297, DOI: 10.5272/jimab.2012183.290.

Abstract

Stroke patients are at higher risk of developing cognitive impairment. Cognitive dysfunctions, especially progressive ones, worsen stroke prognosis and outcome. A longitudinal follow-up of cognitive disorders, however, is rendered difficult by their heterogeneity and the lack of definitions generally agreed upon. Stroke is a major cause of cognitive deficit. The identification of risk factors, clinical determinants and laboratory markers of post-stroke cognitive deficit may help detect patients at increased risk of cognitive deterioration, and prevent or delay the occurrence of post-stroke cognitive impairments. Though inflammatory processes have been implicated in the pathogenesis of stroke, their role in the complex pathophysiological mechanisms of post-stroke cognitive impairment is not completely understood. Evidence suggests that elevated serum C-reactive protein is associated with both the increased risk of stroke and post-stroke cognitive deficit. The hypothesis of a possible relationship between markers of systemic inflammation and cognitive dysfunctions raises the question of how rational the option of applying non-steroidal anti-inflammatory drugs in a proper therapeutic window will be, especially during the acute phase of stroke, to prevent cognitive decline and dementia.

Key words: stroke, cognitive impairment, dementia, inflammation, CRP.

23. **Danovska M**, Alexandrova M. Low grade inflammation in diabetic hypertensive individuals. *Scripta Scientifica Medica*, 2012; vol. 44 (1): 63-65.

Abstract

Individuals with hypertension and diabetes mellitus are at high risk of cerebrovascular and cardiovascular morbidity and mortality. Such a combination of vascular risk factors has a multifactorial pathophysiology but they are both recognized as pro-inflammatory conditions. The objective of the study was to test the hypothesis that low grade systemic inflammation is present in hypertensive diabetic individuals.We examined 19 (8 male and 11 female) diabetic hypertensive individuals, median age 61 years, and 18 (7 male and 11 female) healthy age-matched controls. Serum hs-CRP level (p=.000) and peripheral white blood cell count (p=0.049) were found to be significantly higher in hypertensive diabetics than in control subjects. There is increasing evidence that some markers of low-grade inflammation are associated with future risk of atherosclerotic complications and may serve as predictors of stroke and myocardial infarction. Knowing the complex functional interrelationship between traditional vascular risk factors and low-grade inflammation may help achieve primary prophylaxis of cerebrovascular and cardiovascular events.

Future studies should address the therapeutic potential of inflammatory markers reduction for successful vascular protection in high-risk patients.

Key words: diabetes, hypertension, stroke, inflammation, CRP.

24. Totsev N, Andreev T, **Danovska M**, Ovcharov M. A rare case of subtentorial artevio-venous malformation: case report. *Journal of Biomedical & Clinical Research,* 2013; 6 (2): 135-138.

Abstract

The majority-over 80% of arteriovenous malformations (AVMs) are supratentorial. The infratentorial AVM are uncommon and different from other intracranial AVMs in terms of diagnosis, treatment, prognosis and follow up. The authors present a case of an intracranial hemorrhage, caused by rupture of an AVM in the posterior cranial fossa. Native (unenhanced) CT and computed tomography angiography (CTA) images of this rare location of AVM are presented.

Key words: subtentorial arteriovenous malformations CTA.

25. **Дановска М**., Стаменов Б, Александрова М, Вълкова М. Детерминанти за повишен риск от когнитивно влошаване при остър исхемичен мозъчен инсулт. *Невросонология и мозъчна хемодинамика* 2013: 9 (1); 23-31. ISSN 1312-6431.

Abstract

Objective: To identify significant determinants associated with increased risk of cognitive impairment in the acute phase of ischemic stroke.

Methods: The study was carried out on 47 patients (26 males and 21 females, mean age 63 years), admitted to the Neurology Clinic, University Hospital of Pleven, within the first 24 hours of stroke onset. Clinical, neuropsychological and neuroimaging studies were performed. Routine biochemical blood parameters and serum concentrations of high-sensitivity C-reactive protein (hs-CRP) were measured on admission of the patients to the clinic.

Results: Our results showed that 57% of the patients had cognitive impairment at hospital discharge. Age (p=0.0001), education (p=0.001), baseline systolic blood pressure (p=0.015), hyperglycemia (p=0.021) and serum hs-CRP level (p=0.050) on admission were the significant determinants of early cognitive deterioration. Of all the variables, serum hs-CRP level (OR 1, 12 (1,00–1,25), p=0,049), gender (OR 5,97 (1,05-34,00), p=0,044) and age (OR 1,30 (1,09–1,55), p=0,004) were identified as independent predictors of post-stroke recovery.

Discussion: Measuring of serum hs-CRP in correlation with some clinical parameters in acute ischemic stroke is important factor for prevention of post-stroke cognitive disturbances.

Key words: cognitive impairment, dementia, hs-CRP, stroke.

26. **Danovska M**, Alexandrova M, Gencheva I. Abnormal Levels of Inflammatory and Oxidative Stress Markers in Patients with Arterial Hypertension and Diabetes Mellitus. *Journal of Biomedical & Clinical Research.* 2013: 6 (2); 89-93.

Summary

Individuals with hypertension and diabetes mellitus are at high risk of cerebrovascular and cardiovascular morbidity and mortality. Recent advances on the multifactorial pathophysiology of atherogenesis provide important information about the complex interrelations between traditional risk factors, inflammation and oxidative stress in mediating all stages of atherosclerosis. The objective of the present study was to determine if some inflammatory and oxidative stress markers differ in patients with arterial hypertension and diabetes mellitus versus healthy age-matched controls. Our results reveal significant difference in the blood pro/antioxidant activities in

hypertensive diabetics versus healthy age-matched controls. The investigation of inflammatory and oxidative stress markers along with the traditional risk factors proves useful in the complex assessment of vascular risk and primary prophylaxis of cerebrovascular and cardiovascular events.

Key words: diabetes, hypertension, inflammation, oxidative stress, CRP.

27. **Danovska M**, Alexandrova M, Totsev N, Gencheva I, Stoev P. Clinical and Neuroimaging Studies in Patients with Acute Spontaneous Intracerebral Hemorrhage. *Journal of IMAB-Annual Proceeding* (Scientific papers) 2014, 20 (2) 489-494.DOI: 10.5272/jimab.201402.489.

Abstract

Objective: To define the prognostic value of clinical and neuroimaging parameters on the 30-th day mortality and clinical outcome after spontaneous intracerebral hemorrhage (sICH).

Materials and methods: we examined 88 patients with sICH admitted to Neurology Clinic, UMHAT Pleven within 48 hours after clinical symptoms onset. Glasgow Coma Scale (GCS) score was used to assess the primary stroke severity; neurological deficit on admission was assessed by National Institute of Health Stroke Scale (NIHSS); clinical outcome at discharge was evaluated by modified Rankin Scale (mRS) and by Glasgow Outcome Scale (GOS) on the 30-th day after sICH onset. Hematoma volume was measured by the formula of Kothari: AxBxC/2 in ml. The statistical analysis was performed by SPSS 19.0 and Statgraphics plus 4.1 for Windows.

Results: Initial assessment of primary stroke severity and neurological deficit by GCS и NIHSS, hematoma localization and volume were found strongly correlated with the clinical outcome on the 30-th day after the sICH onset. Age and vascular risk factors did not correlate with the clinical outcome. Male patients had better survival on the 30-th day compared with the female ones.

Discussion: Neurological deficit on admission, hematoma localization and volume were found reliable predictors of the 30-th day clinical outcome that could serve for early stratification of patients and optimal choice of therapeutic approach.

Key words: CT, neurological deficit, sICH, clinical outcome.

28. **Danovska M**, Peichinska D, Valkova M, Stamenov B. Verbal choice in ischemic stroke patients with anomic aphasia. *Journal of IMAB-Annual Proceeding* (Scientific papers) 2014, 20 (2) 495-497.DOI: 10.5272/jimab.201402.495.

Abstract

Background and purposes: Anomic aphasia is common in patients with left hemispheric strokes. The purpose of this study was to explore the verbal production of ischemic stroke patients with anomic aphasia.

Contingent and methods: Fifty ischemic stroke patients admitted to the Neurology Clinic of University Hospital Pleven were studied by neuropsychological battery and CT scan of the brain. Verbal productivity changes found were analyzed in relation to the speech recovery education.

Results: All the patients showed lower scores at all nominative and reproductive speech subtests.

Discussion: Among the ischemic stroke patients with mild anomic aphasia comparatively great was the percentage of low frequency word actualization and verbal fluency impairment. The usage of nominatives in speech expression of ischemic stroke patients is less as compared with that one of predicatives. Actualization of particles, unions, prepositions and interjections was comparatively high thus compensating the difficulty in choice of a definite lexical number.

Conclusion: Future studies on testing of verbal choice in ischemic stroke patients should confirm its practical significance for the assessment of speech disorders concerning a special speech-recovery education.

Key words: Verbal choice, ischemic stroke, anomic aphasia.

Публикации в пълен текст в рецензирани научни сборници на научни звена или доклади от научни прояви

29. Попова М, **Дановска М**, Русев Р, Симеонова В, Кючуков Г. Проникване на кръв във вентрикуларната система при хемисферни паренхимни кръвоизливи (клинико-компютъртомографско проучване. *Актуални проблеми на неврологията и психиатрията*, 1991, бр.2; 14-21.

Резюме

Цел на проучването е да се съпоставят скенеграфските данни за размерите и локализацията на кръвоизлива, за степента на изпълване на вентрикулната система с кръв и за изразеността на мозъчния оток с клиничната симптоматология, протичането и изхода на заболяването при болни с паренхимни голямохемисферни кръвоизливи. Обект на проучването са 197 болни с доказани чрез КАТ супратенториални интрацеребрални хематоми. Болнита са на възраст от 29 до 81 години. Болните са разделени на две групи в зависимост от скенеграфски доказаното на личие на кръв във вентрикулите- 126 (64%) без кръв във вентрикулите и 71 (36%) с проникване на кръв във вентрикулите. Не са установени различия по пол. Не се установяват съществени различия между двете групи по отношение на тежестта на отпадната двигателна симптоматика. С много висока статистическа достоверност се различават двете групи по отношение наличието на двустранен пирамиден синдром и очедвигателни нарушения. Значими различия се установяват и по отношение на наякои витални функции и соматични усложнения. Съпоставянето на скенеграфските показатели за размери и локализация на хематома, и мозъчен оток демонстрират съществени различия. Потърсена е корелационна връзка между скенеграфските параметри и леталния изход. Резултатите от нашето проучване позволяват да приемем, че при болните със супратенториални паренхимни кръвоизливи с проникване на кръв във вентрикулите, клиничното протичане е по-тежко, а леталитетът – по-нисък. С много по-висока честота при болните с проникване на кръв във вентрикулната система се наблюдават различни по степен количествени нарушения на съзнанието, многократно повръщане, нетежко изразен менингеален синдром, очедвигателни разстройства, двустранен пирамиден синдром, ранно повишение на телесната температура, нарушение в пулсовата честота, кръвоизливи в ретината. Описаният като патогмоничен за проникване на кръв във вентрикулите хормеотоничен синдром се наблюдава сравнително рядко и преходно. С вентрикулен пробив се усложняват кръвоизливи с големи размери с капсулерна (смесена) таламо-ганглионарна локализация и капсуломедиални хематоми. Болни с масивно запълване на мозъчните вентрикули с кръв, но с малки размери на кръвоизливното огнище надживяват мозъчния инсулт.

Ключови думи: интрацеребрален кръвоизлив, проникване на кръв във вентрикулите, КТ, прогноза.

30. Попова М, **Дановска М**, Русев Р, Симеонова В, Лиловски Хр., Русев Р, Тоцев Н, Симеонов И, Денчев Д. Проникване на кръв във вентрикуларната система при хемисферни паренхимни кръвоизливи (клинико-компютъртомографско проучване). *Основни проблеми в неврологията* 1994: 30-32.

Резюме

Обект на настоящето проучване са 197 болни с доказани чрез КАТ супратенториални интрацеребрални хематоми. За целите на проучването е разработена програма, включваща 55 показатели - 30 клинични, 17 – резултати от лабораторно-инструментални изследвания и 8 - от патологоанатомично изследване. Съпоставени са клинични показатели със скенеграфски параметри и е анализирана тяхната значимост за прогнозата и клиничния изход от заболяването. Все още спорен е въпросът за прогностичната стойност на локализацията и размерите на хематома, мозъчния оток и проникването на кръв във вентрикулната система. Установена бе умерена корелационна зависимост между изхода на заболяването и проникването на кръв във вентрикулната система (r=0.461) и мозъчния оток (r=0.330) и значителна за размерите на кръвоизливното огнище (r=0.549). С увеличаване на размерите на кръвоизливното огнище нараства броят на починалите и относителният дял на тези с проникване на кръв във вентрикулите сред тях. Резултатите от настоящето проучване позволяват да приемем, че при болните със супратенториални паренхимни кръвоизливи с проникване на кръв във вентрикулите клиничното протичане е по-тежко, а леталитетът по-висок.

Ключови думи: супратенториален хематом, проникване на кръв във вентрикулите, леталитет, прогноза.

31. Попова М, **Дановска М**, Симеонова В, Лиловски Х, Русев Р, Пейчинска Д, Тоцев Н. Медиални мозъчни кръвоизливи-клинико-компютъртомографски анализ. *Основни проблеми в неврологията* 1994: 32-34.

Резюме

Обект на настоящето проучване са 67 болни с медиални хематоми, от които 43 (64.2%) мъже. 56 от болните преживяват заболяването, а завършилите летално 11 (16.4%) са патоанатомично изследвани. Пациентите са на възраст до 79 години. Направен е подробен анализ на клиничната симптоматология. При всички пациенти е проведена КТ. При 56 (83.6%) се визуализира кръвоизлив с диаметър под 30 mm (при 10 от тях под 15 mm). От тях летялно е завършил 1 пациент с белодробна емболия. При 11 от болните е измерен диаметър на кръвоизлива на 30 mm като 10 от тях са завършили летално. Нашите резултати потвърждават литературните данни, според които диаметър на кръвоизливното огнище от 30 до 33 mm е критичен по отношение на прогнозата. Прогнозата на таламичните кръвоизливи е сериозна, а леталитетът е висок. В нашия клиничен контингент леталитетът е 16.4%. Независимо от високия относителен дял на болни с тежък двигателен дефицит в острия стадии 30 болни (44.8%) се възстановиха напълно или до пълно самообслужване.

В заключение може да се обобщи, че въвеждането на КТ позволява не само прежизнено диагностициране на таламичните кръвоизливи, но и да променим становището си за наблюдаваната при тях клинична симптоматология с доминиране на огнищни неврологични симптоми, сравнително не голям леталитет и относително добра прогноза по отношение на двигателното възстановяване и независимостта в ежедневните дейности.

Ключови думи: медиален кръвоизлив, КТ, прогноза, леталитет.

32. Popova M, **Danovska** M, Simeonova V, Rusev R, Peichinska D, Lilovsky Chr, Kyuchukov G, Totzev N. Thalamic hemorrhage - a clinical and CT analysis. *Scientific works of Medical University of Pleven*, 1995, vol XV, N2:44-46.

Abstract

This is a report on 67 patients with CT verified thalamic hemorrhage. Classical clinical symptoms of brain hemorrhage were found in ¼ of the patients. The prevalent focal neurologic symptoms were as follows: severe motor deficiency in 70.1%, sensory disorders -67.2%, oculomotor disturbances – 49.3%, aphasia -29.8%, early vegetative dysfunction – 19.4%. According to CT data, a hemorrhagic focus less than 30 mm in diameter was registered in 83.6% of the patients, blood ventricular penetration in 52.2%, and midbrain shift in 35.8%. Fatal outcome occurred in 16.4%, while 44.8% of them recovered completely or to a degree to perform daily living activities alone.

Key words: thalamic hemorrhage, prognosis, CT scan.

33. Popova M, **M. Danovska**, V. Simeonova, R. Russev, Chr. Lilovski, D. Peichinska, N. Ivanova. Leukocyte count, body temperature and vegetative symptoms in spontaneous hemispheric hemorrhage. *Scientific works of the Medical University of Pleven*, 1997, vol.XVII, N 2, 3-6.

Abstract

The frequency and prognostic value of peripheral leukocyte count, vegetative symptoms and body temperature in 197 patients with CT-verified spontaneous hemispheral hemorrhage within 72 hours of onset were analyzed. CT data for hematoma volume moderately correlated with body temperature (r=0.40), with vegetative symptoms (r=0.40), and with leukocyte count (r=0.31), while blood ventricle penetration correlated with body temperature (r=0.47) and with vegetative symptoms (r=0.48). Moderate correlation between the clinical outcome and peripheral leukocyte count (r=0.46) and vegetative symptoms was found, while a significant one was found about body temperature within the 72 hours of onset (r=0.598).

Key words: intracerebral hemorrhage, leukocyte count, prognosis, body temperature, vegetative disturbances.

34. Попова М, Симеонова В, **Дановска** М, Ангелова Л, Тоцев Н. Интрацеребрални калцификати в базалните ганглии с автозомно-доминантно онаследяване. *Научни трудове на IMAB*, 1997, т.3, 105-107.

Резюме

Неартериосклеротичните, идиопатични интрацеребрални калцификати в базалните ганглии са описани за първи път през 1930 г. Понастоящем са описани фамилни случаи с автозомно-рецесивно и автозомно-доминантно онаследяване , повечето от които с патологични неврологични и психотични синдроми. Представя се пациент на 42 г., при който случайно са установени симетрични калциеви отлагания в базалните ганглии при компютърна томография (КТ) по повод генерализирана травма. При неврологичното и лабораторно изследвания не са установени патологични промени. Проучени са всички членове на фамилията като при двама от тях –майката и сестрата се визуализират симетрични интрацеребрални калциеви отлагания в базалните ганглии. Въз основа на класификацията на C. Billard et al бихме могли да причислим наблюдаваните от нас фамилни случаи на интрацеребрални калцификати в базалните ганглии към четвърта група от класификацията, характеризираща се с автозомно-доминантно онаследяване с минимални неврологични симптоми само при най-възрастните членове от семейството. Най-възрастният член е майката (63 г.), но при нея не са установени постоянни огнищни неврологични симптоми и психични нарушения. Наблюдението на семейството продължава.

Ключови думи: интрацеребрални калцификати, базални ганглии, КТ.

35. Цветанов П, М.Атанасова, К.Яблански, П.Илиева, **М.Дановска,** С.Стефанов, В.Капарашева. Ранни клинични и ЕМГ данни при нодозен полиартериит. *Медицински преглед Сърдечно-съдови заболявания* 2006, бр.4, 10-17.

Summary

The connective tissue diseases are systemic inflammatory diseases sharing the common features of involving of muscle, joints, and the skin. Vasculitis or other immune mediated changes in the vasculature are often a component of these diseases. Patients with myositis may be found to have features of other connective tissue disorders. Dermatomyositis (DM) may be associated with features of sclerodermia and mixed connective tissue disease. Polymyositis (PM) is associated with many systemic autoimmune diseases, and isolated PM is rare. DM and PM may be associated with nonspecific symptoms such as fever and arthralgia, and with Reynnaud's phenomenon. In such patients, the myositic component may be mild and initially overlooked. We present a 27-year old patient with $HbsAg^+$ polyartheritis nodosa and prolonged onset with myalgia, mild proximal muscle weakness associated with fever, arthralgia, and significant weight loss. The muscle biopsy revealed perimysial inflammation with muscle fibre pathology. Six months later, the clinical features of polyartheritis nodosa associated with myositis and multifocal mononeuropathy were manifested.

Key words: polyartheritis nodosa/pathology, electromyography (source MeSH).

36. Цекова М, В.Симеонова, В.Томова, Б.Стаменов, **М.Дановска**, В.Петкова. Оценка на конвенционалните рискови фактори при пациенти със съчетание на миокарден и мозъчен инфаркт. *Медицински преглед Сърдечно-съдови заболявания*, 43, 2007, N3, 51-56.

Abstract

Aim of the study was the assessment of risk factors, clinical course and prognosis in patients with cerebrovascular accident (CVA) and acute myocardial infarction (AMI). The population sample of the survey were 49 patients treated for CVA and acute AMI during cerebrovascular accident, in the University Multifunctional Hospital for Active Treatment "Dr Georgy Stransky" - Pleven, during last 5 years. Men to women proportion was 4:1 and mean age of the patients was 62.7±10.1 years. The outcome of the patients was assessed according to Rankin score scale for global risk stratification of patients with CVA. Prognostic value of the variables was defined by statistical analysis (regression and correlation). The patients with acute ischaemic stroke and acute myocardial infarction, which occurred during stroke, were with the worst prognosis and with very high in-hospital mortality (40%). The immediate cause of death in the half of the deceased patients were complications of AMI. Risk factors with a highest prognostic value for unfavourable prognosis were: age, permanent atrial fibrillation, congestive heart failure, size of myocardial infarction and the extent of cerebral lesion assessed by CT.

Key words: cerebrovascular accident, stroke, acute myocardial infarction, risk factors, prognosis.

37. Александрова М, **Дановска М**, Бочев П. Редокс-баланс на кръвта на болни с остър хеморагичен инсулт. *Сборник от научна конференция с международно участие, Стара Загора*, 2005;4:397-403.

Abstract

Hemorrhagic stroke is characterized by high mortality in the acute stage. The pathophysiological mechanisms that lead to brain tissue injury after hemorrhagic stroke are probably connected with generation of reactive oxygen species and processes of lipid peroxidation.

The aim of this review is to present the current knowledge of the blood redox balance in hemorrhagic stroke. The relationship between the inflammatory response, abnormalities in lipid

metabolism and the degree of oxidative damage are considered. The antioxidant defense system of stroke patients are examined as well.

A question of future investigations is the application of new medicaments for treating hemorrhagic stroke.

Key words: stroke, hemorrhage, radicals, lipid peroxidation, antioxidants, risk factors.

38. Александрова М**, Дановска М**, Бочев П, Стаменов Б. Серумните липидни хидропероксиди – потенциален маркер за степента на неврологичния дефицит при пациенти с остър спонтанен интрацеребрален кръвоизлив. *Сборник с доклади от Международна научна конференция - Стара Загора*, 5-6 юни 2008, CD носител.

Abstract

Oxidative stress is considered as a potential contributor to the pathogenesis of different central nervous systems injuries. Lipid hydroperoxides (ROOH), non-radical products of lipid peroxidation, are used as an indicator of oxidative stress-mediated damage.

In the present study, ROOH levels were measured in the serum of patients with acute spontaneous intracerebral hemorrhage (ICH) during the first 24 hours after the stroke onset. It was found that ROOH concentration correlated with the patient's neurological status assessed by NIHSS and Glasgow scales.

Future studies should show whether serum ROOH concentration may be considered a reliable marker of severity of neurological deficits in patients with ICH.

Key words: spontaneous intracerebral hemorrhage, lipid peroxides, neurological deficit.

Учебници, учебни ръководства

39. **General Neurology**, учебник за студенти по медицина, Издателски център, ВМИ Плевен, 2002 год.

Chapter 1: Reflex activity and its clinical significance (1-15).

Chapter 6: Syndromes of spinal cord and brain stem lesions (175-206).

Chapter 7: Autonomic nervous system and autonomic disorders (207-228).

Chapter 10: Alterations of consciousness. Brain Death (267-284).

Preface

The book "General Neurology" is addressed to foreign medical students, trained in English in Bulgaria. It is intended to present knowledge on General Neurology, taught in our country. In Bulgaria, neurology is studied as a separate medical specialty. In accordance with the syllabus, the training is organized in two semesters. During the first semester, students study general neurology, and during the second semester-clinical neurology. Training in general neurology includes basic knowledge of neuroanatomy, neurophysiology, neurological syndromes, topical diagnosis in neurology. The course of training in general neurology is designed to enable students to acquire practical skills to examine patients, find pathological signs, summarize them in specific neurological syndromes and assess their localization.

We didn't find a suitable student's book in General Neurology that meets the requirements of the Bulgarian syllabus, which is why we compiled this book "General Neurology". It is written in clear and concise English and we hope that foreign medical students, whose native language is no English could easily read it.

Theoretical knowledge is combined with practice-oriented approach to neurological patients and skills of neurological examination. Neurological information included in the handbook slightly exceeds the level of knowledge required from students, so it may later serve as a reference book. English and Latin terminology is used in parallel (Latin words are italicized). We have prepared a very detailed list of contents to facilitate finding the topics presented.

Резюмета от международни научни форуми, публикувани в научни списания или сборници с резюмета на научни прояви

40. Popova M, Peichinska D, Rouseff R, **Danovska M**, Simeonova V. Motor and aphasic defficiency in patients with spontaneous hemispherial hemorrhage. *XII-e session des Journees medicales Balkaniques* Janina, Greece 1993. Resumes des traveaux, 49.

Abstract

The authors analyze CT data about hematoma's volume and localization with the neurologic syndrome severity (aphasic and motor) in 35 patients with spontaneous cerebral hemispherical hemorrhage. A relative correspondence was found only in the clinical and neuropsychological investigations in the beginning. After the hospital treatment was over in 1 patient (2.9%) aphasia persisted; in 9 (25.7%) aphasic disorders were insignificantly affected; in 10 (28.6%) a significant improvement was registered and 15 (42.8%) recovered totally. The long term observation showed that motor recovery was usually more continuous. Total motor recovery was observed in 11 patients (31.4%) only; significant (ability of self-service) in 6 (17.1%) and ability of walking in 17 (48.5%).

41. Popova M, **Danovska M**, Rouseff R, Simeonova V. Prognostic value of CT in patients with intracerebral hemispherical hemorrhage. *XII-e session des Journees medicales Balkaniques* Janina, Greece, 1993. Resumes des traveaux, 48.

Abstract

The authors analyze 30 clinical and 17 laboratory parameters in 197 patients with spontaneous hemispherical hemorrhage verified by computer tomography (CT). The results from the computer program "Statgraphics" are as follows: significant correlation between the clinical outcome and hematoma's volume (r=0.549); moderate correlation for blood penetration in the ventricles (r=0.461) and brain edema and midline brain shift (r=0.330). A regressive model for early prognostic value was done on the base of the statistical analysis.

42. Simeonova V, Popova M, **Danovska M**, Tisheva S. Control of risk factors in diabetic patients with myocardial infarction and minor stroke. *XIII Semaine Medicale Balkanique*, Istanbul, 1994, Resumes des travaux, 57.

Abstract

We compare the principal risk factors in patients with diabetes mellitus with myocardial infarction or minor stroke. We studied 73 clinical and laboratory parameters. 105 diabetic patients were included in the study, all of them under 60 yrs, 63 with myocardial infarction and 42 with reversible ischemic neurologic deficit or transient ischemic attacks. No differences between the groups regarding type or duration of diabetes or the presence of arterial hypertension were noted. There was a significant male prevalence in the MI group. No difference in distribution by age, social status with chronic emotional stress, family history for diabetes or MI, alcohol abuse or inadequate diet was established. 50% of the stroke group had family history of arterial hypertension exceeding 115 mm

Hg was significantly higher in the MI group. The higher percent of patients with systolic hypertension was over 180 mm Hg (19%) and hypercholesterolemia in the MI group was not statistically significant. In stroke patients, presence of 2 or more risk factors was significantly higher.

43. **Danovska** M, Popova M, Simeonova V, Rouseff R. Patients with arterial hypertension and minor stroke - education for avoiding risk factors. *XIII Semaine Medicale Balkanique*, Istanbul, 1994, Resumes des travaux, 58.

Abstract

We followed up 126 patients with arterial hypertension and minor stroke (RIND), below 60 yrs, treated in the Neurology Clinic of Medical University-Pleven during the last three yrs. 78.6% with complete and 21.4% with significant recovery. Stroke risk factors were determined after current literary data and individual program for secondary stroke prevention was applied. The following presence of stroke risk factors was established: Socioeconomic stress-62%; familial stroke-39%; myocardial infarction-25%; familial arterial hypertension-100%; burden with diabetes mellitus-14%; smoking-53%; irrational feeding with elevated sodium intake-21%; elevated sodium intake and fats-32%; obesity-29%; diabetes mellitus-16%; myocardial infarction and arrhythmia-7%; hyperfibrinogenemia-21%. The observation showed effective control upon arterial hypertension and diabetes mellitus achieved by adequate medical treatment and diet. Finally permanent light disability was registered in 14.3% of the patients only, while the rest came back to their usual physical and social activities.

44. Popova M, Simeonova V, **Danovska M**, Uzunov J. Specific secondary prevention of arterial hypertension in patients after myocardial infarction and minor stroke. *XIII Semaine Medicale Balkanique*, Istanbul, 1994, Resumes des travaux, 58.

Abstract

The authors followed up prospectively 2 groups of patients (after myocardial infarction and minor stroke) treated in Cerebrovascular and Cardiovascular Intensive Care Units of Medical University-Pleven. We studied 218 patients with normal neurologic status or with minor neurologic deficit in good cardiovascular status. The patients were investigated and compared to current world literature concept of risk factors with the purpose to make specific individual program for secondary stroke prevention. As a result we did not find significant difference between the two groups concerning socioeconomic status, use of alcohol, irrational feeding with sodium intake, levels of cholesterol and fibrinogen. Myocardial infarction was present with significantly higher frequency in smokers, in patients with diabetes, obesity arterial hypertension and hypertriglyceridemia. Minor stroke patients revealed higher frequency of familial hypertension and combination of risk factors I 1 patient. Our results allow us to recommend not only specific medical treatment, but also specific secondary prevention of controllable risk factors and early prevention of familial arterial hypertension, early screening for diabetes and hypertension.

45. **Danovska M**, Stamenov B, Alexandrova M. Complex interrelations between inflammation and vascular risk factors determine cognitive impairment in acute ischemic stroke.. *European Journal of Neurology Special Issue*: Abstracts of the 16th Congress of the EFNS 2012 Abstract book, p 163 **(IF 4.162; инд. IF 1.388)**.

Abstract

Introduction: Cognitive impairment following acute ischemic stroke is common, yet its determinants are not fully understood.

Objective: This study aims to identify significant determinants, associated with increased risk of cognitive impairment in the acute phase of ischemic stroke.

Patients and methods: The study was carried out on 47 patients (26 males and 21 females), median age 63 years, with no baseline dementia. All the patients were assessed with NIHSS, MMSE and mRS. Routine biochemical analyses and CT scan were performed within the first 24 hours of stroke onset. Serum concentrations of hs-CRP were measured on admission.
Results: Our results showed that 57% of the patients had cognitive impairment at discharge. We also established that age (p=0.000), education (p=0.001), baseline systolic blood pressure (p=0.015), hyperglycemia (p=0.021) and serum hs-CRP level (p=0.050) on admission were significant determinants of early cognitive deterioration.
Of all the variables, serum hs-CRP level (OR 1,12 (1,00-1,25), p=0,049), gender (OR 5,97 (1,05-34,00), p=0,044) and age (OR 1,30 (1,09-1,55), p=0,004) were identified as independent predictors of post-stroke cognitive impairment. After baseline systolic blood pressure was entered in the predictive model, gender lost its statistical significance of independent predictor, which could be explained with gender-related variations of arterial hypertension.
Conclusion: Measuring serum hs-CRP level along with with some clinical and neuroradiological predictors is a rational approach in the complex assessment of acute ischemic stroke in view of treatment strategies and prevention of cognitive deterioration.
Keywords: ischemic stroke, cognitive impairment, inflammation, hs-CRP, vascular risk factors.