Реферати

ОЦІНКА ФУНКЦІОНАЛЬНИХ ТИПІВ МОБІЛІЗАЦІЇ ОРГАНИЗМУ НА ПІДСТАВІ ДИНАМІЧНОГО АНАЛІЗУ СПЕКТРАЛЬНИХ ПОКАЗНИКІВ ВАРІАБЕЛЬНОСТІ РИТМУ СЕРЦЯ ТА ЇХ КЛАСИФІКАЦІЯ

Невойт Г.В., Потяженко М.М., Мінцер О.П.

Стаття присвячена вивченню електромагнітних феноменів серцевої діяльності людини і можливостям клінічного їх використання в практичній медицині для оцінки рівня здоров'я з метою профілактики НІЗ. У статті наведені результати динамічного аналізу спектральних показників серцевої діяльності при виконанні функціонально здоровими людьми ортостатичної проби. Автори вперше описали чотири функціональних типи мобілізації/адаптації, дали характеристику і інтерпретацію їм, запропонували варіант їх класифікації на основі кібернетичної моделі двохконтурної регуляції серцевої діяльності Р.М. Баевского.

Ключові слова: варіабельність ритму серця, спектральний аналіз.

Стаття надійшла 12.09.2019 р.

ОЦЕНКА ФУНКЦИОНАЛЬНЫХ ТИПОВ МОБИЛИЗАЦИИ ОРГАНИЗМА НА ОСНОВАНИИ ДИНАМИЧЕСКОГО АНАЛИЗА СПЕКТРАЛЬНЫХ ПОКАЗАТЕЛЕЙ ВАРИАБЕЛЬНОСТИ РИТМА СЕРДЦА И ИХ КЛАССИФИКАЦИЯ

Невойт А.В., Потяженко М.М., Минцер О.П.

Статья посвящена изучению электромагнитных феноменов сердечной деятельности человека и возможностям клинического их использования в практической медицине для оценки уровня здоровья с целью профилактики НИЗ. В статье приведены результаты динамического анализа спектральных показателей сердечной деятельности при выполнении функционально здоровыми людьми ортостатического пробы. Авторы впервые описали четыре функциональных типа мобилизации/адаптации, дали характеристику и интерпретацию им, предложили вариант их классификации на основе кибернетической модели двухконтурной регуляции сердечной деятельности Р.М. Баевского.

Ключевые слова: вариабельность ритма сердца, спектральный анализ.

Рецензент Катеренчук І.П.

DOI 10.26724/2079-8334-2020-3-73-81-87
UDC 616.831-002

L.V. Pypa, R.V. Svistilnik, K.Yu. Romanchuk, O.O. Gordiichuk, D.G. Smolko
National Pyrogov Memorial Medical University, Vinnytsya

CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF ACUTE BACTERIAL MENINGITIS IN ADULTS OF KHMELNYTSKYI REGION

e-mail: pipa_l_v@ukr.net

We analyzed 123 cases of acute bacterial meningitis, where 74 cases were in men and 49 cases - in women. 93.5% of cases began with fever, headache (86.2%), vomiting (69.9%), epileptic seizures (1.6%), altered level of consciousness (17.8%) and meningeal syndrome (80,2%). The etiological factor was established in 20.3% of patients. In 41.4% of patients neurological complications were observed. The terminal end was observed in 7.3% of patients**.** The main causative agent of acute bacterial meningitis was S. pneumoniae (56.0%), the second place was taken by N. meningitidis (36.0%), the third one was divided between S. aureus and L. monocytogenes (4.0%). Brain edema (90.2%), paresis of extremities (11.7%) and epileptic seizures (7.8%) were frequent complications. The prevalence of acute bacterial meningitis was 0.86 per 100 thousand population per year in the ratio between men and women of 1.5:1 and the total annual mortality of 0.06 per 100 thousand population.

Key words: bacterial meningitis, epidemiology, etiology, adults.

The study is a fragment of the research project "The course of infectious diseases depending on genetic, morphological and metabolic factors", state registration No. 0118U005454.

Acute bacterial meningitis (ABM) is one of the main causes of mortality from infectious diseases in the world [7]. Over the last few decades the incidence of ABM in children has decreased, but it leaves a significant burden of morbidity in adults with a mortality of about 30% [13].

The prevalence of ABM in average is 3 per 100 thousand population in the world and may vary depending on the age of patients, their sex and country [3].

In the United States in recent decades there have been some changes in the etiology and mortality of ABM with a tendency to decrease due to the introduction of combined vaccines from Neisseria meningitidis and Streptococcus pneumoniae and dexamethasone inclusion in the clinical protocols for the treatment [4].

The most common complication of the disease arises after meningitis caused by S. pneumoniae in comparison with other pathogens. Hearing disorder is one of the most common ABM complications. Other ABM complications include loss of limbs in the development of meningococcal sepsis, development of subdural empyema, hydrocephalus and epileptic seizures. The emergencies of neurocognitive impairment are frequent complications of ABM [13].

Three most common pathogens (Haemophilus influenza-b, N. meningitidis, and S. pneumoniae) are responsible for more than 80% of ABM cases worldwide [4]. However, the epidemiology of ABM

pathogens can vary depending on the geographical location of the country, climatic conditions, age of patients and other factors. The study of such factors and the epidemiology of ABM especially the study of the etiological structure and its dynamics in time with the establishment of sensitivity to antibiotics is especially important for proper and timely control of morbidity [12].

The purpose of the work was to analyze the etiological structure, epidemiological features, socio-demographic profiles and the nature of the development of complications from the central nervous system in acute bacterial meningitis in adults of the Khmelnytsky region during 2007-2017.

Materials and methods. Prospective analysis of 123 cases of ABM was performed in adults, who were treated at Khmelnytskyi Infectious Diseases Hospital from 2007 to 2017. Of them, 74 patients were men and 49 were women.

The disease etiology was established by the simultaneous use of several methods for detecting the pathogen namely: bacterioscopy of the smear of cerebrospinal fluid with staining of the material on Gram, bacteriological sowing of blood and cerebrospinal fluid, detection of the genetic material of the pathogen in the liver by the PCR method.

The central nervous system complications were detected on the base of clinical picture of their development (paresis of extremities, epileptic seizures, etc.) and by additional research methods, mainly CT and MRI, both during the acute period of the disease and during the early reconvalescence. In the study we used an analytical method, and the processing of the results was carried out by means of determining the standard deviation of the arithmetic mean (M±σ), Student's criterion and constructing a 95% Confidence Interval (CI) for the mean difference.

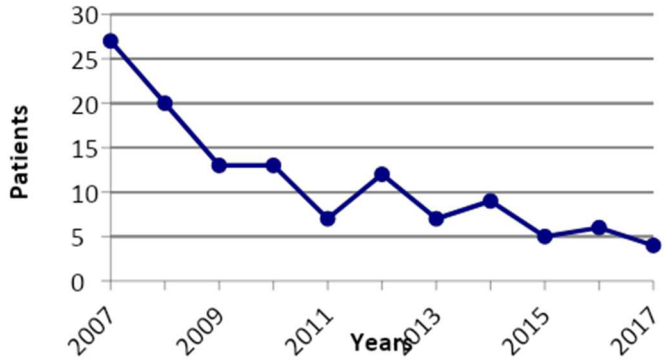

Fig. 1. The dynamics of ABM incidence rate in adults of Khmelnytskyi region during 2007-2017.

Results of the study and their discussion. Analyzing the dynamics of the ABM morbidity in adults, it can be noted that the peak incidence occurred in 2007 and 2008. In the future, since 2009, the incidence has become mostly stable with small annual fluctuations and a gradual noticeable decrease to a minimum in 2017 as shown in the fig. 1.

First of all, the similar tendency of morbidity could be connected with social, demographic and climatic factors (especially by population migration and a decrease in the number of adult population in the region) as well as the introduction of planned in Excise from Hib infection in children and diminishing its fate in the overall structure of the ABM.

ABM in adults arose in all seasons. In general the highest seasonal increase in the ABM incidence in adults was in August, and from October to December and made up 46.3% of the total annual incidence.

The lowest incidence was observed in January and February (5.7% and 4.9% respectively) as well as in June and July months (by 5.7%). Since August, there has been a sharp increase in the incidence (13.0%), which is steadily held in October (11.4%), November (11.4%) and December (10.6%) (fig. 2).

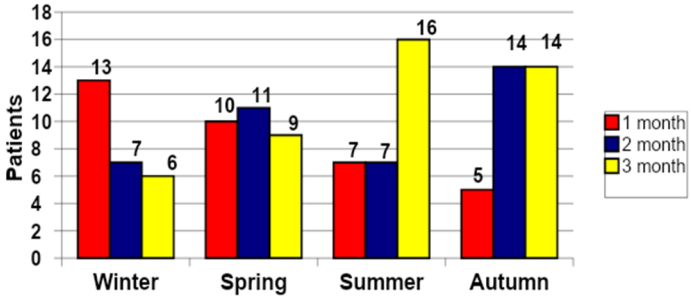

Fig. 2. Seasonal morbidity of ABM in adults in Khmelnytskyi Region from 2007 to 2017.

The increase in the ABM incidence in adults in the autumn period is most likely due to seasonal climatic changes and seasonal migration, increased respiratory diseases and increased number of contacts with other people.

Seasonal variation in the ABM incidence can vary from country to country and from research depending on climatic, environmental and demographic factors.

An average age of adult patients with ABM was 41.2±16.4 years. According to age categories, the ABM incidence was distributed as follows: in the young age from 18 to 39 years 62 (50.4%) patients were sick, with an average age of 40 to 59 years – 41 (33.3%) patients were sick, in the elderly from 60 to 79 years old – 19 (15.4%) patients were sick and older than 80 years – 1 (0.9%) patient was sick. Thus, the vast majority of ABM cases were found in young people aged 18-39 (50.4%) accounting for more than

half of adult patients. Probably this was due to the fact that this age category of the population is most socially active and primarily exposed to both environmental factors and social and demographic factors.

According to the data, the number of male patients with ABM was 74 (60.2%) people, while the female population was 49 (39.8%) patients which corresponded to the 1.5:1 of male to female ratio.

The etiological factor of ABM was established in 25 patients (20.3%) (fig. 3). The detection of bacterial agents in other countries and regions varies slightly and does not always reach even the average depending on the methods and availability of using the modern methods of verifying the pathogen, years of research and other factors.

In the Russian Federation the level of detection of ABM agents in the country was 37.1%, where the detection of meningococcal etiology was 41.8%, and not 32% of meningococcal etiology [10]. At the same time in Germany in the period from 2000-2009 the detectability of the pathogen was 83% [9].

Fig. 3 shows that S. pneumoniae is the main pathogen in adults among ABM which was detected in 15 (56.0%) cases. N. meningitidis took second place in ranked 9 (36.0%) patients. The third place was shared between S. aureus and Listeria monocytogenes which were detected in one case (4.0%).

It should be noted that in 6 (66.6%) cases the serogroup N. meningitidis was detected with the most frequent meningococcal serogroup B occurring in 3 (50.0%), in some cases serogroups A, C and W135 (by 16.6%).

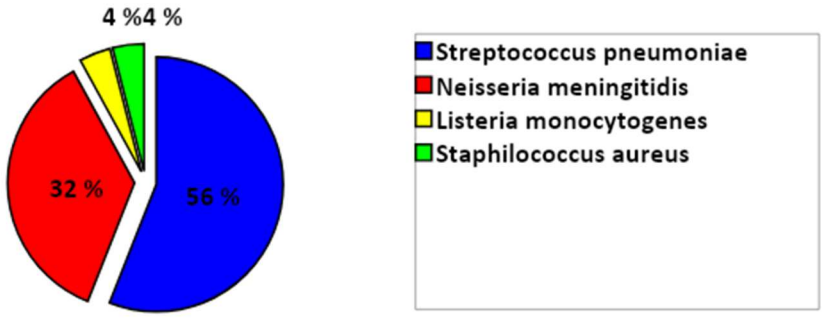

Fig. 3. Etiological structure of ABM in adults in Khmelnytskyi Region in 2007-2017.

The method of PCR cerebrospinal fluid was verified by the pathogen in 1 (4.0%) patient, bacterioscopy of the cerebrospinal fluid smear in 12 (48.0%) patients, by indirect hemagglutination test in 1 (4.0%) patient and by the method of bacteriological sowing of the material in a total of 20 (80.0%) patients. The method of bacteriological cure of the cerebrospinal fluid was verified by the causative agent in 17 (85.0%) patients, sowing in 3 (15%) patients and in 1 (5.0%) of the patient the stem was sown simultaneously both in the blood and in the cerebrospinal fluid.

In some countries, the etiological structure of the ABM can differ from the usual one through the use of vaccines from the main pathogens of meningitis, as well as possibly geographic and climatic factors. However, in most countries S. pneumoniae is the key etiologic factor in adult ABM.

In Qatar, Staphylococci (20.1%) and S. pneumoniae (16.2%) were the most common pathogens of ABM. Among Gram-negative pathogens Klebsiella pneumoniae was detected in 10.2% of cases and N. meningitidis in 9.4% of cases [8].

In Germany, the study also revealed that S. pneumoniae was the main pathogen in adult's ABM cases and was detected in 50.5% of patients, S. aureus (10.5%) and N. meningitidis (9.4%) took the second and third places [9] .

The prevalence of S. pneumoniae over other etiological factors of ABM in adults can be due to a significant percentage in the structure of bacterial meningitis secondary forms, which are mainly caused by S. pneumoniae. In our observation, the secondary nature of ABM was detected in 20 (16.2%) patients, where 7 (35%) patients were with the etiological factor of the disease which was S. pneumoniae. Among the main hearths of infection that led to the development of ABM were: purulent sinusitis (50%), purulent otitis (25%), mastoiditis (20%) and pneumonia (5%).

In the course of the studies, it was determined that N. meningitidis was susceptible to most antibacterial agents in all cases, namely: chloramphenicol, ampicillin, penicillin, ceftriaxone, meropenem, ofloxacin, amikacin, and gentamicin.

S. pneumoniae was almost always susceptible to levomycetin, ampicillin, penicillin, ceftriaxone, meropenem, ofloxacin, amikacin, vancomycin, ciprofloxacin, levofloxacin and rifampicin.

The clinical picture was characterized by severe courses in 120 (97.5%) patients and in 3 (2.5%) patients the course was moderately severe.

In 67 (54.5%) patients the disease was overwhelming as meningitis, whereas meningoencephalitis was diagnosed in 56 (45.5%) persons. In 13 (10.6%) people with meningococcal meningitis the disease was accompanied by the development of meningococcemia.

The clinical manifestation of ABM is presented in table 1. In 93.5% of cases the disease began with fever, headache (86.2%), vomiting (76.4%), epileptic seizures (1.6%), altered level of consciousness (17.8%) Meningeal syndrome was detected in 80.2% of patients with neck stiffness.

Hyperesthesia was observed in 45.5% of patients and was manifested as a general excitability for sensory and tactile stimuli during examination and in the form of photophobia or phonophobia.

Table 1

Clinical manifestations of acute bacterial meningitis in adults

Clinical symptoms	Number of patients	%
Fever	115	93.5
Headache	106	86.2
Vomiting	86	69.9
Neck stiffness	98	79.6
Kernig's symptom	44	35.7
Symptom of Brudzinsky	17	13.8
Hyperesthesia	56	45.5
Stun	16	13.0
Sopor	6	4.9
Epileptic seizures	2	1.6
Focal Neurological Symptoms	29	23.6
Petechiae rash	13	10.6

Violation of consciousness was most often observed in the form of stunning (13.0%), less often in the form of a sopor (4.9%).

Focal neurological symptoms were presented in the form of the development of limb paresis in 1 (3.4%) patient, paresis of the cranial nerves in 7 (24.1%) patients, limb tone disorders, anisoreflexia and the presence of pathological reflexes in 21 (72.5%) patients. The debut of the disease in the form of petechial rash was exclusively observed in meningococcal meningitis with meningococcemia.

In our observation, 51 (41.4%) patients experienced both acute and late neurological complications of the disease, much of them were severe (fig. 4).

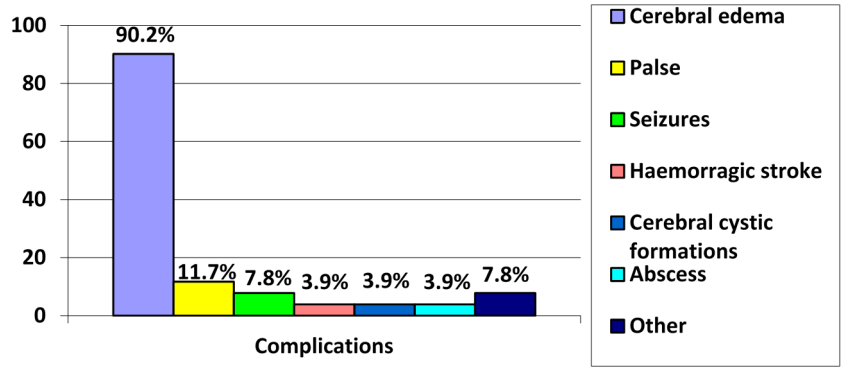

Fig. 4. General complications of ABM in adults from the central nervous system during the disease.

Of the severe and most frequent disorders that complicated the course of the disease, there were: cerebral edema (90.2%), paresis of extremities (11.7%), epileptic seizures (7.8%). There were also hemorrhagic strokes (3.9%), abscess formations (3.9%) and cerebral cystic formations (3.9%) detected. In others, lesions (7.8%) in rare cases (1.9%) were subdural hygromas, ischemic stroke, lesions of cranial nerves and hydrocephalus. In 17 (33.3%) patients, several complications were observed simultaneously.

Among 51 patients who had severe complications, in 12 patients the pathogens were identified. In 10 (19.6%) patients S. pneumoniae was the pathogen and 2 (3.9%) patients had N. meningitidis.

The outcome of the disease with complete recovery was observed in 72 (58.5%) patients. In 18 (14.6%) patients, the consequences of the transmitted disease as asthenic syndrome were observed in 8 (44.4%) patients, autonomic disorders syndrome were observed in 2 (11.1%), epilepsy were observed in 1 (5.6%), hemiparesis were observed in 2 (11.1%), hydrocephalus were observed in 1 (5.6%) and paralytic obliquity were observed in 1 (5.6%) patient. In 3 (16.7%) patients were observed severe cognitive and behavioral disorders, which in the future required counseling and treatment by a psychiatrist.

Also during the study period 9 (7.3%) patients died, including 6 (66.6%) males and 3 (33.3%) females, which corresponded to a ratio of 2:1 with a total annual mortality of 0.06 per 100 thousand of adult population.

In all deceased patients the disease went through as meningoencephalitis. In virtually, all of the deceased the cause of death was the development of cerebral edema with insertion into a large occipital opening.

In 2 (22.2%) dead patients, the pathogens of S. pneumoniae were detected, as well as in the 3 (33.3%) cases the primary source of infection was detected.

According to our study, the mortality rate for ABM in adults was not higher in comparison with studies in other countries of the world, which can be explained by the improvement of timely diagnosis and care to patients with suspected ABM and improvement of the medical process using the treatment protocols and worldwide recommendations for this pathology. At the same time, the percentage of mortality from the ABM is slightly different from each other according to various studies and may depend on the prevalence of the structure of the disease of an etiological factor, age division of patients, treatment approach and the country.

Thus, in the German observation for 10 years of studying ABM in adult's, total mortality was 15% [9]. In the Iranian study the mortality from ABM was 8.3% [6].

The development of similar clinical symptoms characteristic of ABM in different ratios was also noted in studies by other authors.

According to Wei-An Lai et al, (2011), with ABM in adults fever was detected in 86% of cases, disturbance in consciousness was detected in 62%, epileptic seizures in 30%, leukocytosis in 53%, and an infectious and toxic shock in 11% of patients [11] .

In the study of F.Y. Khan et al, (2017) fever was observed in 94.0% of adult patients, altered level of consciousness in 47.0%, headache in 36.6%, vomiting in 29.9%, meningeal symptoms in 26.5%, and epileptic seizures in 19.7% of patients [8].

Sometimes divergent clinical data of the studies from different countries could be explained by different age structures of patients (prevalence of elderly patients or conversely), presence of concomitant pathology, etiological factor of ABM and other reasons which determines the importance and necessity of research of clinical symptoms in separate regions and countries.

The highest level of neutrophil cytosis was observed in meningitis caused by N. meningitidis which was 5815.8±4436.8 cl/mm^3 and significantly exceeded the cytosis level in meningitis caused by S. pneumoniae, at which it reached 2659.5±2004.5 cl/mm^3 ($p<0.03$) (95% CI, 306.5 to 6006.0 cl/mm^3).

The high level of cytosis in meningitis-induced N. meningitidis can be explained by a significant inflammatory response of the organism in response to the release of endotoxin from bacteria, the main factor of the occurrence of infectious and toxic shock, which is released only when bacteria break down, which is especially characteristic of meningococcus and other Gram-negative bacteria. The toxic effect of endotoxin causes the stimulation of cells of the immune system, which leads to the release of a large number of inflammatory mediators and cytokines with the development of severe inflammatory response.

On the contrary, the level of cerebrospinal fluid protein was the highest with meningitis caused by S. pneumoniae and composed 1.77±0.60 g/l in comparison with meningitis-induced N. meningitidis, where its level reached 1.14±0.53 g/l ($p<0.02$) (95% CI, 0.09 to 1.16 g/l). Such a difference can be explained by the fact that the meningitis caused by S. pneumoniae has a more severe course and is much more likely to cause the brain lesions with the development of neurological complications and the tendency to abscess due to the influence of exotoxin pneumolysin [2].

Neurological complications that arise with ABM can increase the likelihood of a fatal end and lead to patients' disability [7]. Cerebral vascular complications with ABM can include the development of ischemic and hemorrhagic stroke [7]. The development of ischemic stroke with ABM promotes the vasculitis of cerebral vessels, vascular spasm and their thrombosis. [9]. According to J. Bodilsen et al. (2014), an ischemic stroke occurs in 8-25% of patients with ABM [1]. Hemorrhagic stroke is a less common complication in ABM and occurs in 3-9% of patients, mainly with meningitis-induced S. pneumoniae [5]. Inflammation and pressure increased in the subarachnoid space can cause cranial neuropathy. Damage of the brain structures contributes to the development of psycho-neurological disorders and cognitive disorders [7]. In the study of Heydari B. et al. (2016) the development of neurological complications in the form of cranial nerves paralysis arose in 11.1% of cases, hearing impairment - in 5.5% of cases and hemiparesis - in 2.8% of cases of 36 patients. In total, complications from the central nervous system appeared in 7 patients (19.4%) [6]. Early detection of such complications and their treatment may reduce the ABM mortality and its consequences [7].

Taking into account epidemiological data, in the course of the study the prevalence of ABM among adults in the Khmelnytskyi region was determined. In total it was 0.86 per 100 thousand adult population per year. It can be noted that the obtained indicator is close to the general indicator for the European population, which, according to EFNS data is 1-3 per 100 thousand populations.

Conclusion

The annual dynamics of ABM morbidity in adults is predominantly stable and occurs during all seasons with slight annual fluctuations and a marked peak in 2007-2008 and a gradual decrease to a minimum in 2017. The average age of adult patients with ABM was 41.2±16.4 years. Mostly young people aged 18-39 years (50.4%) are diagnosed with ABM. The disease is more common in men than in women in the ratio of 1.5:1. The etiological factor of ABM was established in 25 (20.3%) patients. S. pneumoniae are the main pathogens among adults with ABM and were detected in 14 (56.0%) cases. N. meningitidis took second place and was detected in 8 (32.0%) patients. The third place was shared between S. aureus and Listeria monocytogenes which was detected in 1 case (4.0%).

In our observation, 51 (41.4%) patients had neurological complications of the disease. The most frequent complications were cerebral edema (90.2%), limb paresis (11.7%), epileptic seizures (7.8%). The most severe cerebral complications occurred with meningitis caused by S. pneumoniae. The outcome of the disease with complete recovery was observed in 72 (58.5%) patients and in 18 (14.6%) patients, the consequences of the disease were observed.

During the study, 9 (7.3%) patients died, which corresponded to an annual mortality of 0.06 per 100 thousand adult population. During the study, the prevalence of ABM among adults in the Khmelnytskyi region was determined. In total it was 0.86 per 100 thousand per year. It should also be noted that the incidence of ABM in adults tends to decrease. If by 2012 the prevalence of ABM among the adult population was 1.2 per 100 thousand, then from 2012 to 2017 it already amounted to 0.5 per 100 thousand. A similar trend can be explained by a decrease in the population of the region in recent years, as well as the introduction of planned vaccination against Hib infection in childhood and reducing its share in the structure of ABM in adults.

References

1. Bodilsen J, Dalager-Pedersen M, Schønheyder HC, Nielsen H. Stroke in community-acquired bacterial meningitis: a Danish population-based study. Int J Infect Dis 2014; 20: 18–22.
2. Braun J S, Hoffmann O, Schickhaus M, Freyer D, Dagand E, Bermpohl D, Mitchell T J, Bechmann I, Weber J R. Pneumolysin causes neuronal cell death through mitochondrial damage. Infection and Immunity. 2007; 75(9): 4245–4254.
3. Brouwer M C, Tunkel A R, van de Beek D. Epidemiology, Diagnosis, and Antimicrobial Treatment of Acute Bacterial Meningitis. Clinical Microbiology Reviews. 2010; 23(3): 467-92.
4. Castelblanco R L, Lee M, Hasbun R. Epidemiology of bacterial meningitis in the USA from 1997 to 2010: a population-based observational study. Lancet Infect Dis. 2014; 14(9): 813–819.
5. Domingo P, Pomar V, de Benito N, Coll P. The spectrum of acute bacterial meningitis in elderly patients. BMC Infectious Diseases. 2013; 13: 108.
6. Heydari B, Khalili H, Karimzadeh I, Emadi-Kochak H. Clinical, Paraclinical, and Antimicrobial Resistance Features of Community-Acquired Acute Bacterial Meningitis at a Large Infectious Diseases Ward in Tehran, Iran. Iranian Journal of Pharmaceutical Research. 2016; 15 (1): 347-354.
7. Julayanont P, Ruthirago D, De Toledo JC. Bacterial meningitis and neurological complications in adults. The Southwest Respiratory and Critical Care Chronicles. 2016; 4(14): 5-16.
8. Khan F Y, Abu-Khattab M, Almaslamani E A, Hassan A A, Mohamed S F, Elbuzdi A A, Elmaki N Y, Anand D, Sanjay D. Acute Bacterial Meningitis in Qatar: A Hospital-Based Study from 2009 to 2013. BioMed Research International 2017; 2017: 2975610.
9. Klein M, Koedel U, Pfefferkorn T, Zeller G, Woehrl B, Pfister H-W. Arterial cerebrovascular complications in 94 adults with acute bacterial meningitis. Critical Care. 2011; 15: 281.
10. Koroleva I S, Beloshitsky G V, Koroleva M A, Zakroyeva I M, Spirikhina L V, Mironov K O, Shipulin G A. Meningococcal infection and purulent bacterial meningitis in the Russian Federation: 10-year epidemiological observation. Epidemiology and Infectious Diseases. 2013; 2: 15-20.
11. Lai W-A, Chen S-F, Tsai N-W, Chang C-C, Chang W-N, Lu C-H, Chuang Y-C, Chien C-C, Huang C-R. Clinical characteristics and prognosis of acute bacterial meningitis in elderly patients over 65: a hospital-based study. BMC Geriatrics. 2011; 11: 91.
12. Manjiyil I J, Moorkoth A P, Santhakumari R D. Bacteriological profile of acute bacterial meningitis in adults in a tertiary care hospital in North Kerala. J. Evolution Med. Dent. Sci. 2016; 5(46): 2884-2888.
13. McGill F, Heyderman R S, Panagiotou S, Tunkel A R, Solomon T. Acute bacterial meningitis in adults. The Lancet. 2016; 388(10063): 3036-3047.

Реферати

КЛІНІКО-ЕПІДЕМІОЛОГІЧНА ХАРАКТЕРИСТИКА ГОСТРИХ БАКТЕРІАЛЬНИХ МЕНІНГІТІВ У ДОРОСЛИХ ХМЕЛЬНИЦЬКОЇ ОБЛАСТІ

Пипа Л.В., Свістільнік Р.В., Романчук К.Ю., Гордійчук О.О., Смолко Д.Г.

Проведений аналіз 123 випадків гострих бактеріальних менінгітів, 74 з яких у чоловіків і у 49 жінок. У 93.5% випадків захворювання розпочиналось з

КЛИНИКО-ЭПИДЕМИОЛОГИЧЕСКАЯ ХАРАКТЕРИСТИКА ОСТРОГО БАКТЕРИАЛЬНОГО МЕНИНГИТА У ВЗРОСЛЫХ ХМЕЛЬНИЦКОЙ

Пыпа Л.В., Свистильник Р.В., Романчук К.Ю., Гордийчук О.А., Смолко Д.Г.

Проведен анализ 123 случаев острого бактериального менингита, 74 из которых у мужчин и 49 у женщин. В 93.5% случаев заболевание начиналось с

лихоманки, головного болю (86.2%), блювоти (69.9%), судом (1.6%), порушення свідомості (17.8%) і менінгеального синдромокомплексу (80.2%). Етіологічний чинник був встановлений у 20.3% пацієнтів. У 41.4% пацієнтів спостерігались неврологічні ускладнення. Летальний наслідок спостерігався у 7.3% пацієнтів. Головним збудником гострих бактеріальних менінгітів виявився S. pneumoniae – 56.0%, друге місце посла N. meningitidis – 36.0%, третє поділили між собою S. aureus і L. monocytogenes (по 4.0% випадків). Частими ускладненнями виявлялися набряк мозку (90.2%), парези кінцівок (11.7%) і епілептичні припадки (7.8%). Розповсюдженість гострих бактеріальних менінгітів склала 0.86 на 100 тис населення в рік в співвідношенні між чоловіками і жінками 1.5:1 та загальною річною смертністю 0.06 на 100 тис населення.

Ключові слова: бактеріальний менінгіт, епідеміологія, етіологія, дорослі.

Стаття надійшла 28.08.2019 р.

лихорадки, головной боли (86.2%), рвоты (69.9%), судорог (1.6%), нарушения сознания (17.8%) и менингеального синдромокомплекса (80.2%). Этиологический фактор был установлен у 20.3% пациентов. У 41.4% пациентов наблюдались неврологические осложнения. Летальный исход наблюдался у 7.3% пациентов. Главным возбудителем острого бактериального менингита оказался S. pneumoniae – 56.0%, второе место заняла N. meningitidis – 36.0%, третье поделили между собой S. aureus и L. monocytogenes (по 4.0% случаев). Частыми осложнениями были отек мозга (90.2%), парезы конечностей (11.7%) и эпилептические припадки (7.8%). Распространенность острого бактериального менингита составила 0.86 на 100 тыс населения в год в соотношении между мужчинами и женщинами 1,5:1 и общей годовой смертностью 0.06 на 100 тыс населения.

Ключевые слова: бактериальный менингит, эпидемиология, этиология, взрослые.

Рецензент Дельва М.Ю.

DOI 10.26724/2079-8334-2020-3-73-87-91
UDC 616.13-06:616.379-008.64-06:617.586]-089.85-072

G.S. Puzyrov, V.I. Lyakhovskyi, V.I. Shepitko, A.V. Sydorenko
Ukrainian Medical Stomatological Academy, MOH of Ukraine, Poltava

MORPHOLOGICAL JUSTIFICATION OF THE STEPWISE DOSED BALLOON ANGIOPLASTY APPLICATION COMPARED TO STANDARD METHODS IN PATIENTS WITH DIABETIC FOOT

e-mail: puziryov@ukr.net

The main reason for the development of lower extremities gangrene in diabetes mellitus is impairment of their blood supply. In recent decades, endovascular surgical treatment has played a significant role in restoring blood supply. However, the issues of complications that arise after such interventions, the reasons for their occurrence, what morphological changes occur in the atherosclerotic artery wall during their implementation remain understudied. Therefore, experimental research to study the local changes that occur in the arteries of the lower extremities during balloon angioplasty, especially in patients with ischemic diabetic foot, is an urgent problem of modern interventional surgery. The purpose of the study was to provide a morphological justification for the use of stepwise dosed balloon angioplasty using balloons of different diameters and lengths compared to standard methods in patients with ischemic form of diabetic foot syndrome. An experimental study was performed on 20 lower limbs that were amputated at the hip level for foot gangrene in patients with ischemic form of diabetic foot syndrome. The first group included 5 (25.0%) lower extremities, in which immediately after the surgery, sections of the tibial arteries with stenosis of more than 75% were sampled. Group II included 5 (25.0%) amputated lower extremities, which immediately after the surgery were performed a typical balloon angioplasty. Group III included 10 (50%) amputated lower extremities, in which the method of stepwise dosed balloon angioplasty was tested. According to the results of experimental studies, it was found that mainly when performing staged dosed angioplasty according to the proposed method, the inner elastic membrane of the artery was clearly pronounced, had insignificant areas of fragmentation. At the same time, the outer elastic membrane was quite well pronounced throughout the whole length, had insignificant areas of fragmentation and they were much less in number than in those cases when angioplasty was performed according to standard methods. Moreover, in the outer membrane, where vasa vasorum and vascular nerves were located, they remained almost unchanged. Reducing the number and sizes of arterial membranes' dissection, their fragmentation when performing staged dosed balloon angioplasty by the proposed method using balloons of different diameters and lengths permits to recommend it in practice to reduce the incidence of thrombotic complications in the early postoperative period.

Key words: arteries, atherosclerosis, arterial occlusion, diabetes mellitus, diabetic foot, balloon angioplasty.

The work is a fragment of the research project "Development of modern scientifically based principles of stratification, monitoring and prognostication of surgical diseases and injuries course", state registration No.0120U101176.

Over the past 10-15 years, the incidence of diabetes mellitus (DM) in Ukraine has almost doubled to more than 1.5 million people. The syndrome of diabetic foot (DFS) occurs in every fourth patient and ends in almost half with high amputation of one or both lower extremities [3]. Two thirds of patients die from gangrene of the lower extremities, and its development in patients with diabetes is observed many-fold more frequently than in the general population. [6, 7].

The main reason for the development of the lower extremities gangrene in diabetes mellitus is an impairment of their blood supply [11, 12]. The main method of restoring blood flow in this disease is surgical revascularization, but this method can be used to a limited extent in patients with virtually no distal blood flow and with the presence of severe comorbidities. In addition, there is currently no reliable