

## MODERN ASPECTS OF PNEUMOCOCCAL MENINGITIS IN ADULTS

Rabbimova Nodira Tashtemirovna, Matyakubova Feruza Egamovna, Ergasheva Munisa Yakubovna,  
Tursunboev Husan  
Samarkand State Medical University, Republic of Uzbekistan, Samarkand

## КАТТАЛАРДА ПНЕВМОКОКК МЕНИНГИТИНИНГ ЗАМОНАВИЙ АСПЕКТЛАРИ

Раббимова Нодира Таштемировна, Матякубова Феруза Эгамовна, Эргашева Муниса Якубовна,  
Турсунбоев Хусан  
Самарканд давлат тиббиёт университети, Ўзбекистон Республикаси, Самарканд ш.

## СОВРЕМЕННЫЕ АСПЕКТЫ ПНЕВМОКОККОВОГО МЕНИНГИТА У ВЗРОСЛЫХ

Раббимова Нодира Таштемировна, Матякубова Феруза Эгамовна, Эргашева Муниса Якубовна,  
Турсунбоев Хусан  
Самаркандский государственный медицинский университет, Республика Узбекистан, г. Самарканд

e-mail: [info@sammu.uz](mailto:info@sammu.uz)

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**Резюме.** Сўнги 10 йил ичида пневмококкли менингит (ПМ) билан касалланиш даражаси тўлқинли эди. Катталардаги ПМ асосан оғир кечиши билан тавсифланган (85,7%). Пневмококк инфекциясининг инвазив шакллари олдани олиш учун 50 ёшдан ошган катта ёшли беморларни ва коморбид ҳолатларда хавф гуруҳидаги беморларга стандарт эмлаш амалиётига пневмококк вакциналарини киритиш керак.

**Калит сўзлар:** пневмококк, менингит, пневмококкли инфекция, *S.pneumoniae*.

**Abstract.** The incidence of PM over the past 10 years has been undulating. In adults, PM was mainly characterized by a severe course (85.7%). Given the severe course of PM, the frequent and early development of complications, in order to prevent invasive forms of pneumococcal infection, it is necessary to introduce pneumococcal vaccines into the practice of standard vaccination of adult patients over 50 years of age, as well as patients from risk groups with comorbid conditions.

**Keywords:** pneumococcus, meningitis, pneumococcal infection, *S.pneumoniae*

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**Relevance.** Diseases of pneumococcal etiology, due to the special severity of the course, are a significant medical and social problem for many countries in the world [1,2,9,14]. Pneumococcal disease (PM) is a group of diseases caused by the bacterium *Streptococcus pneumoniae*. Pathologies of pneumococcal etiology include: pneumococcal pneumonia (up to 70% of all pneumonias), acute otitis media (about 25% of all otitis media), purulent pneumococcal meningitis (5-15% of all bacterial meningitis), endocarditis (about 3%), sepsis, pleurisy, arthritis, sinusitis, otitis media, mastoiditis and others [3,7,11,14]. Pneumococcal meningitis is characterized by high rates of mortality and disability, significant socio-economic losses [12]. Among adults, the most vulnerable are those over 40-50 years of age. In the older age group, there are mainly acute forms of pneumococcal meningitis [10,13].

Mortality in PM in different age groups can reach from 30 to 70%, about 35 - 45% of patients require assistance in the intensive care unit, more than a third of those who have been ill suffer from late complications and residual effects (hydrocephalus, deafness, ataxia, neurological and mental deficiencies of varying severity, etc.). The above data dictate the need to study the features of the course of pneumococcal meningitis.

**The aim of the study was** to study the clinical and epidemiological aspects of pneumococcal meningitis in adults in the Samarkand region over the past 10 years.

**Materials for the study :** the material for the study was the case histories of patients who applied to the regional clinical infectious diseases hospital of the city of Samarkand over the 2008-2018 years.

**Research methods :** epidemiological, anamnestic, clinical and laboratory.

**Results of the study:** An analysis of the incidence of PM was carried out in the period from 2008-2018 according to the data of a retrospective analysis of the case histories of patients who were hospitalized in the regional clinical infectious diseases hospital of the city of Samarkand.

Diagnoses were made on the basis of clinical manifestations, epidemiological data, and laboratory and etiological studies in the context of a standard case definition.

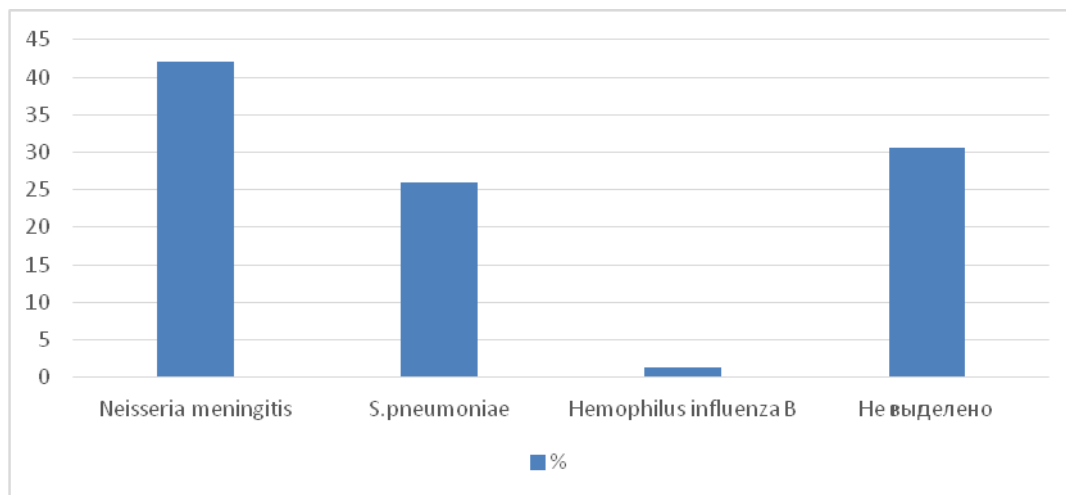
In accordance with the goals and objectives set, we have analyzed the epidemiological, clinical and laboratory aspects of bacterial purulent meningitis (SPM). We analyzed 209 case histories of patients with bacterial purulent meningitis (SPM). So, in the analysis of the etiological interpretation of BGM in 88 (42%) bacteriological examination of the liquor, *Neisseria meningitidis*, in second place in terms of fre-

quency of isolation - 54 (26%) was *S. pneumoniae*, in 3 ( 1.4 % ) cases, *Hemophilus influenza b* . In the remaining 64 (30.6%) cases, the pathogen was not detected (Figure No. 1).

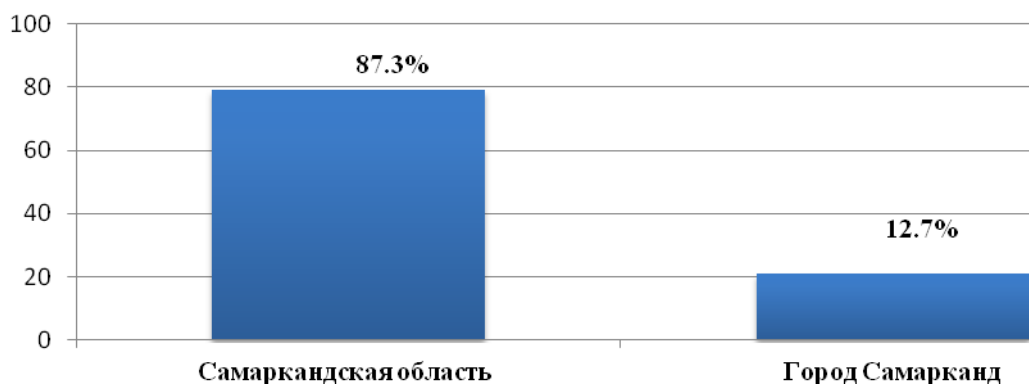
Analysis of the age structure of patients showed that in the age group of 19-25 years the disease occurred in 7.8% of cases, 25-30 years - 26.9%, 30 - 40 years old - 19.7%, over 40 years old in 45.6% of cases . That is, the disease was more common among people of working age (69.1%). When analyzed by gender, among the studied patients, men accounted for 55.7 % , women 44.3% of cases .

(87.3%) was found from the districts of the Samarkand region (Figure 2).

In this regard, we analyzed the type of activity of the patients who applied. Thus, it was found that the disease was more common among people working at a construction site - 15 (27.7%), engaged in agriculture - 10 (18.5%), hired workers - 14 (25.9%), employees - 6 (11.1%), pensioners 5 (9.2%), students - 4 (7.4%). Most often, professional activity was associated with unfavorable working conditions.



**Fig 1.** Etiological interpretation of bacterial purulent meningitis



**Fig. 2.** Distribution of patients by place of residence



**Fig. 3.** Distribution of patients by severity

Analysis of the annual dynamics of the disease showed that the increase in cases occurred in the autumn months - November - 3 (5.6%), with a peak in the winter months - December - 8 (14.8%), January - 13 (24.1%), February - 15 (27.8%), and a slight decrease in cases in the spring months - March - 8 (14.8%), April - 5 (9.2%), May - 2 (3.7%). Patients associated their disease most often with hypothermia - 30 (5-5.5 %).

When analyzing the long-term dynamics of the incidence, it was found that the incidence of PM over the past 10 years was undulating, with a downward trend since 2015 - the total number of hospitalized patients with pneumococcal meningitis has decreased by more than 2 times. The decrease in the number of patients since 2015 is apparently due to the inclusion of vaccination in the National calendar of active immunization of the population. But at the same time, the incidence in adults does not tend to decrease.

In 70.3% of patients, diseases were identified from the anamnesis, which became the primary focus of pneumococcal infection. Thus, pneumonia was detected in 27.7% of patients, sepsis - in 3.7%, otitis media - in 11.2%, sinusitis - in 9.2% of patients. The proportion of patients with an unfavorable life history (craniocerebral injury, frequent respiratory diseases, previous meningitis) was 18.5%.

In 66.5% of cases, the disease developed against the background of severe concomitant diseases: in 22.3% of cases against the background of chronic bronchitis, in 2.7% of cases against the background of cardiovascular pathology, in 5.3% of cases - diseases of the nervous system, in 6.7% of cases - allergic diseases, in 4.9% - diabetes mellitus, in 12.1% of cases of ARI, in 2.5% of cases of herpetic infection. The severity of the disease in many cases depended on the primary focus of pneumococcal infection.

Patients according to severity are distributed in this way (Figure No. 3):

In most cases, the disease proceeded in severe form - 85.2% and moderate form - 14.3%. The patients were hospitalized with the following diagnoses: ARI (47.3%), Chronic tonsillitis (13.1%), Meningitis ? "(7.8%)," OKI. Bronchopneumonia" (12.3%), "Purulent meningitis" (19.5%).

An analysis of the terms of hospitalization of patients showed that the vast majority (74%) of patients were admitted on the 2-3rd day from the onset of the disease to the intensive care unit, where treatment lasted an average of  $7.2 \pm 1.76$  days (length of stay in the hospital). The terms of hospitalization of patients depended on the clinical form of the previous focal pneumococcal infection. In the absence of the primary focus of the disease, no serious complications and consequences were recorded (29.7%).

With late admission to the hospital, severe complications were noted, secondary PM were detected. The current problem of late pre-hospital diagnosis and, accordingly, late hospitalization of patients in an infectious diseases hospital is possibly associated with a more gradual onset of the disease, which affects the severity of the patient's condition upon admission and requires the alertness of practitioners.

When analyzing the clinical course of the disease, it was found that most often patients had meningeal syndrome - in 100% of cases, cerebral syndrome in - 94% and general infectious syndrome in 96% of cases.

In the clinic of the disease, general infectious syndrome, cerebral and **meningeal syndromes occurred with the same frequency**; in adults, unlike children, damage to the cranial nerves was recorded at an earlier period of the disease and occurred more often. In 2.3% of patients, focal symptoms were observed in the form of smoothing of the nasolabial fold, ptosis, anisocoria, gaze paresis. In 23.8% of patients, psychomotor agitation was noted, in 1.3% of patients there was an absence of consciousness, in 5.4% of patients clonic convulsions were noted. In 59.7% of patients, the disease was characterized by a sudden onset with a rise in temperature up to 38°C, less often to higher numbers, severe initial symptoms of intoxication (in 60% of patients) with cerebral phenomena (severe headache, repeated vomiting, impaired consciousness - psychomotor agitation, somnolence, stupor, coma) and encephalitic reactions (tremor of the extremities, convulsions). In 23.5% of cases, in the first days of the disease, paresis of the cranial nerves was detected, more often the abducens and oculomotor nerves.

Clinical symptoms in the general infectious syndrome included an increase in body temperature of varying severity, pallor of the skin, loss of appetite, weakness, lethargy. Pallor of the skin, weakness in all patients. An increase in temperature up to 38.5 C was detected in 36.8 %, up to 39.5 C was detected in 40.7%. An increase in temperature to hyperpyretic figures was most often recorded in patients with a complicated course - in 22.5% of patients.

In all patients with meningeal **syndromes** neck stiffness was recorded, Kernig's symptom was positive in 78.8% of patients, and Brudzinsky's symptom (upper, middle or lower) was determined in 58.3% of patients.

In 85.7% of patients, the following complications were observed: cerebral edema - 27.8%, impaired consciousness - 9.2%, hemodynamic disorders. Residual effects due to the transferred PM were observed - asthenoneurotic syndrome (26.7%), cardiopathy (33.2%), arthritis (12.5%), ataxic syndrome (8.7%), hypertensive syndrome (18.9%).

#### **Conclusions:**

1. The incidence of PM over the past 10 years

has been undulating, with a downward trend since 2015 - the number of hospitalized patients with pneumococcal meningitis has decreased by more than 2 times. The decrease in the number of patients since 2015 is apparently due to the inclusion of vaccination in the National calendar of active immunization of the population. But in adults, the incidence does not tend to decrease. Analysis of seasonality in adults showed that the disease was more often recorded in the winter-spring months. The disease was observed in the form of sporadic cases. Among adults, the incidence was more often observed in persons working in open spaces (41.7%).

2. In adults, PM was mainly characterized by a severe course (85.7%). development \_ pneumococcal meningitis was preceded by diseases of pneumococcal nature: pneumonia, otitis media, sinusitis and concomitant diseases ( 66.5%). In patients without identifying the primary focus of the disease, complications were not recorded (29.7%).

3. Given the severe course of PM, the frequent and early development of complications, in order to prevent invasive forms of pneumococcal infection, it is necessary to introduce pneumococcal vaccines into the practice of standard vaccination of adult patients over 50 years of age, as well as patients from risk groups with comorbid conditions.

4. Considering the foregoing, it is recommended to organize a medical examination in the primary care in order to identify patients with primary foci of pneumococcal infection and severe concomitant diseases in order to prevent invasive forms of PM.

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#### СОВРЕМЕННЫЕ АСПЕКТЫ ПНЕВМОКОККОВОГО МЕНИНГИТА У ВЗРОСЛЫХ

*Раббимова Н.Т., Матякубова Ф.Э., Эргашева М.Я.,  
Турсунбоев Х.*

**Резюме.** Заболеваемость ПМ за последние 10 лет носила волнообразный характер. У взрослых ПМ в основном характеризовался тяжелым течением (85,7%). С целью профилактики инвазивных форм пневмококковой инфекции необходимо внедрить пневмококковые вакцин в практику стандартной вакцинации взрослых пациентов старше 50 лет, и большим из групп риска с коморбидными состояниями.

**Ключевые слова:** пневмококк, менингит, пневмококковая инфекция, *S.pneumoniae*