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GENERAL DESCRIPTION OF PATIENTS WITH COMMUNITY-ACQUIRED PNEUMONIA WHO PASSED AN OPEN COMPARATIVE STUDY

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The article provides a general description of the etiology and pathogenesis of patients with community-acquired pneumonia who passed an open comparative study at the Kharkiv Municipal Clinical Hospital No. 25. The most likely causative agents of community-acquired pneumonia in patients of the Therapeutic Department of the Kharkiv Municipal Clinical Hospital No 25 are *Streptococcus pneumoniae* and mixed cultures of bacteria, with an increase in the proportion of *Staphylococcus aureus*. In modern conditions, when choosing the tactics of antimicrobial therapy for community-acquired pneumonia, it is necessary to consider not only the spectrum of the most likely pathogens, but also the trends in the formation of antibiotic resistance in the leading etiological groups. It is impractical to prescribe empirical antibiotic therapy for community-acquired pneumonia without establishing an etiological diagnosis.

Key words: community-acquired pneumonia, etiology, pathogenesis, standard antibacterial therapy.

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ЗАГАЛЬНА ХАРАКТЕРИСТИКА ХВОРИХ ІЗ ПОЗАЛІКАРНЯНОЮ ПНЕВМОНІЄЮ, ЩО ПРОЙШЛИ ВІДКРИТЕ ПОРІВНЯЛЬНЕ ДОСЛІДЖЕННЯ

У статті представлено загальну характеристику з етіології та патогенезу хворих з позалікарняною пневмонією, які пройшли відкрите порівняльне дослідження у міській лікарні № 25 м. Харкова. Встановлено, що найбільш вірогідними збудниками позалікарняної пневмонії у хворих терапевтичного відділення 25-ї Міської клінічної лікарні міста Харкова є *Streptococcus pneumoniae* та мікст-культури бактерій зі збільшенням частки *Staphylococcus aureus*. У сучасних умовах при виборі тактики антимікробної терапії позалікарняної пневмонії необхідно враховувати не лише спектр найімовірніших збудників, а й тенденції формування антибіотикорезистентності провідних етіологічних груп. Абсолютно недоцільним є призначення емпіричної антибактеріальної терапії позалікарняної пневмонії без встановлення точного етіологічного діагнозу.

Ключові слова: позалікарняна пневмонія, етіологія, патогенез, стандартна антибактеріальна терапія.

The study is a fragment of the research project “Mucoactive and herbal medicines for the treatment of cough in acute infectious and inflammatory diseases of the lower respiratory tract”, state registration No. 0117U000595.

Community-acquired pneumonia (CAP) is one of the most common diseases of infectious (mainly bacterial) etiology in people of all age groups and is accompanied with high mortality, especially among the elderly and newborns. For the first time, convincing evidence of the infectious nature of pneumonia was obtained in 1882–1883 by Friedlander, who found microbes in the lung tissue of more than 50 deceased patients [5].

Further evolution of ideas about the diversity of the CAP etiological structure went in parallel with the improvement of methods for indicating microbial pathogens and their markers, the emergence of new technologies based on molecular biological approaches to the etiological diagnosis of bronchopulmonary infections. Currently, more than 100 microorganisms capable of causing CAP to have been described; almost all of them have been detected at least once in a lung tissue biopsy. However, even the most modern microbiological methods are not able to identify all potential causative agents of CAP, therefore, in 30-50 % of patients, the etiology of the infectious process cannot be established [2].

The purpose of the study was to give a general description of the etiology and pathogenesis of patients with community-acquired pneumonia who passed an open comparative study in the Kharkiv Municipal Clinical Hospital No. 25.

Materials and Methods. We have examined 104 (63 men and 41 women) patients, aged 20 to 80 years, with community-acquired pneumonia, who received treatment in the Therapeutic Department of the Kharkiv Municipal Clinical Hospital No. 25. Prior to hospitalization, patients were not taking antibiotics for this disease (Table 1).

Table 1

Complains and objective signs of patients with community-acquired pneumonia who were treated in the Therapeutic Department of the Kharkiv Municipal Clinical Hospital No. 25

<i>Complaints</i>	
Cough	87 (84)
Expectoration	34 (33)
Sense of not getting enough air/ dyspnoea	21 (20)
Thoracic pain	9 (8.7)
Swelling in the lower extremities	2 (1.9)
Breathing weakened	36 (35)
Breathing hard	29 (28)
Vesicular breath	38 (37)
Voiced fine bubbling moist rales	20 (19)
Crepitation	0 (0)
<i>Objective signs</i>	
Body temperature, °C	36.7
Heart rate, beats per minute	71.4±0.8
Number of breaths per minute	17.0±0.1
Systolic arterial pressure, mm hg	122.7±2.7
Diastolic arterial pressure, mm hg	78.7±1.0
Leukocytes, $n \times 10^9/l$	4.7±0.1
Stab neutrophils, %	1.1±0.1
Sedimentation rate, mm/h	25.3±1.6

The diagnosis of CAP was verified with the obligatory detection of focal infiltration of the lung tissue according to the X-ray examination of the chest organs and the presence of at least two of the following signs [8]:

- acute onset of the disease with body temperature $> 38\text{ }^\circ\text{C}$;
- cough with sputum;
- physical signs (dullness of percussion sound; weak, hard or bronchial breathing; focus of voiced small bubbling rales and/or crepitation);
- leucocytosis ($> 10 \times 10^9/l$) or relating to stab neutrophils ($> 10\%$).

Criteria for exclusion from the study:

- self-administration of antibiotics before hospitalization for this disease > 24 hours; absence of cough during hospitalization;
- age < 18 hours;
- suspected macroaspiration;
- immunodeficiency states, including glucocorticoid therapy;
- tumors of various localization;
- decompensated heart defects;
- mental diseases;
- alcoholism;
- drug addiction;
- disturbance of intestinal absorption [1].

Antibacterial therapy was prescribed follow-up the patient's "antibacterial history" and in accordance with local or national protocols, for an approximate period of 7–10 days. The use of drugs of

other pharmacological groups (non-steroidal anti-inflammatory drugs: NSAIDs, antipyretics, vitamins, antihistamines, etc.) was left at the discretion of the attending physician.

All information about patients (complaints, anamnesis, results of an objective study, data from laboratory and instrumental studies, treatment with indication of doses of medications, frequency of use, tolerance, dynamics of clinical symptoms) was reflected in the case histories and entered the electronic database of the examined patients.

Statistical processing of digital data was carried out by the methods of parametric and nonparametric statistics on a personal computer with the "Statistica 8.0" StatSoft USA using the Student's t-test. The level of reliability was taken at $p < 0.05$.

Results of the study and their discussion. A lot of foreign and fewer domestic publications are devoted to the study of the etiology of CAP. It would seem that these works are quite enough to obtain a complete and objective picture of the etiological structure of CAP. However, we were interested in patients who were directly in the therapeutic department of the Therapeutic Department of the Kharkiv Municipal Clinical Hospital No 25.

We obtained an etiological "portrait" based on the study results of the CAP etiology in adults (age 20-80 years) (Table 2).

Table 2

The main association options of community-acquired pneumonia pathogens detected in patients of the Therapeutic Department of the Kharkiv Municipal Clinical Hospital No 25 (n=104)

Association Options	Detection rate	
	Absolute	%
S. pneumoniae – H. influenzae	32	30.7±3.5
S. pneumoniae – M. pneumoniae	15	14.4±2.1
S. pneumoniae – Adenovirus	10	9.6±1.6
S. pneumoniae – C. pneumoniae	6	5.8±1.2
S. pneumoniae – Herpes simplex I/II	6	5.8±1.1
S. pneumoniae – H. influenzae – M. pneumoniae	8	7.7±1.3
S. pneumoniae – H. influenzae – Herpes simplex I/II	8	7.7±1.2
S. pneumoniae – H. influenzae – Adenovirus	8	7.7±1.2
S. pneumoniae – M. pneumoniae – Adenovirus	5	4.8±1.1
S. pneumoniae – H. influenzae – M. pneumoniae – Adenovirus	4	3.8±0.8
S. pneumoniae – H. influenzae – M. pneumoniae – Herpes simplex I/II	2	1.9±0.9

The etiological structure of CAP according to the results of microbiological studies was as follows: pneumonia in patients with mild and moderate course was caused in most cases by intracellular pathogens, in particular *Mycoplasma pneumoniae*, gram-positive microflora – *Streptococcus pneumoniae*; the pathogen was not identified in 25 % of patients. The leading causative agents of moderate severity pneumonia were *Streptococcus pneumoniae* and mixed cultures of bacteria, with an increase in the proportion of *Staphylococcus aureus*.

The proportion of mixed infections in CAP usually does not exceed 10 % [4], and in people over 60 years it is 54 % [10]. In our studies, it reaches 27 %. The differences may be due to different methodological approaches to the diagnosis of CAP. In addition, when two pathogens are detected, it is difficult to determine the role of each of them: are they equivalent etiological agents, or one initiates a disorder of the bronchial mucosa, and the other causes CAP.

The most numerous groups consisted of the patients with unknown CAP etiology. Causes may include the non-infectious nature of the disease, as well as microorganisms that are difficult to isolate by conventional methods (anaerobes, uncultivated forms of bacteria, or microbes not yet described). However, according to scientists dealing with this problem, the main reason is the lack of attention to the detection of *S. pneumoniae*. This is evidenced by a similar clinical course and clinical and laboratory data when comparing these pneumonias with pneumococcal CAP [1], as well as an increase in the effectiveness of the CAP etiological interpretation up to 75 % with a more thorough diagnosis of pneumococcal infection [3, 6].

In our investigation, we traced the relationship between the etiology of CAP and epidemiological factors influencing the development of the disease. These observations are confirmed by foreign authors (Table 3).

Presented in table 3 data allow to determine the diagnostic search direction for the etiological factors of CAP and the tactics of empirical antimicrobial therapy.

In routine daily practice, we strive to establish the CAP etiology. This allows: firstly, to carry out targeted (etiologic) antimicrobial therapy in a particular patient, to reduce the risk of developing adverse

drug reactions and induced antibiotic resistance of the pathogen during treatment; second, to obtain data on the infections occurrence of requiring infection control measures (for example, legionellosis) or preventive measures (*M. tuberculosis*); accumulate information about new (*Hantaviruses*) or resistant pathogens; avoid unnecessary overuse of antibiotics in the population, and, finally, improve cost-effectiveness by using a narrow-spectrum antibiotic for therapy, which is cheaper to treat and less harmful to the patient [5, 7, 9].

Table 3

Interrelation of epidemiological and other factors with the etiology of CAP (British Thoracic Society; American Thoracic Society; Bartlett J.G. et al.)

Factors	Possible etiology
Chronical Obstructive Pulmonary Disease, smoking	<i>S. pneumoniae</i> , <i>H. influenzae</i> (more often untyped strains), <i>M. catarrhalis</i> , <i>Legionella spp.</i>
Alcoholism	<i>S. pneumoniae</i> , анаэробы, <i>M. tuberculosis</i>
Immunodeficiency, neutropenia	<i>S. pneumoniae</i> , <i>S. aureus</i> , <i>Pneumocystis carinii</i> , <i>Mycobacterium spp.</i> , <i>Candida spp.</i> , cytomegaloviruses
Staying in the nursing home	<i>S. pneumoniae</i> , <i>H. influenzae</i> , <i>S. aureus</i> , anaerobes, <i>C. pneumoniae</i> , <i>M. tuberculosis</i>
Non-sanitized oral cavity	Anaerobes
Legionella epidemic	<i>Legionella spp.</i>
Contact with bats	<i>Histoplasma capsulatum</i>
Contact with birds	<i>C. psittaci</i>
Contact with rabbits	<i>Francisella tularensis</i>
Traveling to the US Southwest	Coccidiomycosis
Contact with agricultural animals	<i>Coxiella burnetii</i>
Influenza epidemic	Influenza virus, <i>S. pneumoniae</i> , <i>S. pyogenes</i> , <i>S. aureus</i> , <i>H. influenzae</i>
Risk of aspiration CAP (mental retardation, encephalopathy, trauma, cerebrovascular disease)	Anaerobes of the oral microflora (<i>Peptostreptococcus spp.</i> , <i>Bacteroides spp.</i> , <i>Veilonella spp.</i>)
Structural lungs pathology (bronchiectasia, mucoviscidosis etc)	<i>P. aeruginosa</i> , <i>Burkholderia cepacia</i> , <i>S. aureus</i> , <i>Candida spp.</i>
Intravenous narcotics administration	<i>S. aureus</i> , anaerobes, <i>M. tuberculosis</i> , <i>Pneumocystis carinii</i>
Obstruction of respiratory ways	Anaerobes
Prior antibiotic therapy	Resistance to penicillium <i>S. pneumoniae</i> , <i>P. aeruginosa</i>

Our analysis made it possible to establish the reliability of the CAP etiological diagnosis, which largely depends on the timely receipt of complete biological material and its adequacy to the objectives of the study, the sensitivity and specificity of the methods used and their combinations, and the correct interpretation of the obtained results. We established that it is necessary to maintain a reasonable balance between the intensity and invasiveness of diagnostic procedures performed in patients and not prescribe empirical antibiotic therapy without establishing an accurate etiological diagnosis. The etiological diagnosis of CAP is extremely difficult for the following: the absence of sputum in the early stages of the disease (in 10–30 % of patients); the impossibility of obtaining bronchial secretions by invasive methods due to the severity of the patient's condition, insufficient qualifications of the medical staff etc; contamination of bronchial contents by the microflora of the upper respiratory tract and oral cavity; high level of carriage of *S. pneumoniae*, *H. influenzae* and other conditional pathogens (from 5 to 60 % in different age groups and population groups); the use of antibacterial drugs in the prehospital stage.

In our hospitalized patients, the set of studies was determined by the severity of the disease and the ineffectiveness of empirical therapy before hospitalization.

Conclusions

1. The most likely causative agents of community-acquired pneumonia in patients of the Therapeutic Department of the Kharkiv Municipal Clinical Hospital No 25 are *Streptococcus pneumoniae* and mixed cultures of bacteria, with an increase in the proportion of *Staphylococcus aureus*.

2. In modern conditions, when choosing the tactics of antimicrobial therapy for community-acquired pneumonia, it is necessary to consider not only the spectrum of the most likely pathogens, but also the trends in the formation of antibiotic resistance in the leading etiological groups.

3. It is impractical to prescribe empirical antibiotic therapy for community-acquired pneumonia without establishing an etiological diagnosis.

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PECULIARITIES OF CLINICAL AND PARACLINICAL INVESTIGATIONS OF WOMEN WITH OVARIAN ENDOMETRIOMAS IN COMBINATION WITH PELVIC INFLAMMATORY DISEASE

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Endometriomas occupy a significant part in the structure of genital endometriosis. A clinical and paraclinical study of 210 patients with endometriomas was conducted. 57 patients (27.1 %) had newly detected endometrial cysts ≤ 4 cm, 46 women (21.9 %) had cysts > 4 cm. Recurrent endometriomas ≤ 4 cm were detected in 71 patients (33.8 %), while > 4 cm were in 36 women (17.1 %). A higher age, severe pelvic pain, and severe manifestations of external genital endometriosis were found in patients with recurrent endometriomas compared to those with newly detected endometrial cysts. In young women, unilateral endometriomas up to 4 cm in size are more often combined with a mild form of genital endometriosis, whereas in older patients endometrioid ovarian cysts, regardless of size, recur more often, are combined with severe manifestations of genital endometriosis, and are accompanied by impaired reproductive function.

Key words: endometrioma, pelvic inflammatory disease, pelvic pain, tumor markers, infertility.

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ОСОБЛИВОСТІ КЛІНІКО-ПАРАКЛІНІЧНОГО ОБСТЕЖЕННЯ ЖІНОК З ЕНДОМЕТРІОМАМИ ЯЄЧНИКІВ ПРИ ПОЄДНАННІ ІЗ ЗАПАЛЬНИМИ ЗАХВОРЮВАННЯМИ ОРГАНІВ МАЛОГО ТАЗУ

Ендометріоми займають значну частку у структурі генітального ендометріозу. Проведено клініко-параклінічне обстеження 210 пацієнок з ендометріомами. У 57 пацієнок (27,1 %) вперше виявили кісти розміром ≤ 4 см, у 46 (21,9 %) – вперше виявлено кісти > 4 см. Рецидивуючі ендометріоми ≤ 4 см діагностували у 71 (33,8 %), а розміром > 4 см – у 36 жінок (17,1 %). Виявлено старший вік, виражений тазовий біль та важкі прояви зовнішнього генітального ендометріозу у пацієнок з рецидивуючими ендометріоїдними кістами яєчників порівняно з групами, де ендометріоми були виявлені вперше. У жінок молодого віку ендометріоми розміром до 4 см частіше поєднуються із легкою формою генітального ендометріозу, тоді як у пацієнок старшої вікової категорії ендометріоїдні кісти яєчників, незалежно від розміру, частіше рецидивують, поєднуються з тяжкими проявами генітального ендометріозу і супроводжуються порушенням репродуктивної функції.

Ключові слова: ендометріома, запальні захворювання органів малого тазу, тазовий біль, онкомаркери, безпліддя.

The study is a fragment of the research project “Creation of diagnostic tactics and pathogenetic justification of effective methods of preservation and restoration of reproductive potential and improvement of parameters of quality of life of the woman with obstetric and gynecological pathology”, state registration No. 0121U109269.

Genital endometriosis (GE) today remains one of the most common disease in women of reproductive age. The introduction of endoscopic diagnostic and treatment technologies has led to an increase in its share in the structure of gynecological problems from 5–10 % to 20–55 %. Among patients