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CAUSES OF ACUTE AND CHRONIC BRONCHITIS, CLINIC, TREATMENT AND PREVENTION

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Abstract

An acute cough is one of the most common reasons for seeking outpatient medical care, and the most common diagnosis in these cases is **acute bronchitis** (AB). Thus, in the USA, out of 30 million patients who consulted a general practitioner for cough in 1997, almost half were diagnosed with OB [1]. In this case, usually (in 70–90% of cases) the diagnosis of OB is associated by a doctor with the need to prescribe antibacterial therapy (ABT). And although in recent years in a number of countries (in particular, in the USA), the scale of unjustified "antibiotic aggression" has decreased somewhat - from 70–75 to 55–60%, at the same time, the frequency of prescription of broad-spectrum antibiotics has increased from 20 to 60% [2] .

EPIDEMIOLOGY

Unfortunately, to date there is no "gold standard" for diagnosing community-acquired lower respiratory tract infections (LRTIs), including OB, which cannot be ignored when analyzing epidemiological data. In addition, most estimates of the prevalence of non-severe forms of OB are based on an analysis of the population's seeking medical care.

The annual incidence of OB varies widely - from 2 to 40% or more, which depends on the population being studied (for example, children attending preschool institutions, schoolchildren, military personnel, residents of nursing homes, etc.) and the specific epidemiological situation. OB occurs approximately twice as often in winter.

OB occupies a leading position in the structure of the INDDP. According to Macfarlane J. (1999), out of 24,000 patients with symptoms of OB, only one in three sought medical help, and the diagnosis of pneumonia, the main clinical alternative to OB, was established in only 1 case out of 240 (Fig. 1). A similar relationship between LRTI and pneumonia was also demonstrated in a large study in the UK (National Ambulatory Medical Care Survey : pneumonia was diagnosed in 4.7% of

patients with acute cough presenting to general practitioners during the period 1980–1994.

Definition

OB is an acute or subacute disease, the leading clinical sign of which is a cough (productive or non-productive), lasting no more than 2-3 weeks and, as a rule, accompanied by general symptoms and symptoms of an upper respiratory tract infection (URTI). For example, in the recommendations of the Australian Society of General Practitioners, we encounter the following diagnostic criteria for OB: acute cough lasting less than 14 days, combined with at least one of the symptoms - sputum production, shortness of breath, wheezing in the lungs or discomfort in the lungs. breast [3].

In this case, most often we mean "uncomplicated" OB, when these symptoms develop in individuals without previous cardiovascular, bronchopulmonary diseases, immunosuppression and/or are not complicated by bacterial superinfection. In cases where the duration of cough exceeds 3 weeks , it is customary to talk about subacute or chronic cough. (Which is not equivalent to the term "chronic bronchitis"! Chronic bronchitis is a disease characterized by a productive cough for ≥3 months for 2 consecutive years or more, with the exception of other bronchopulmonary and/or cardiovascular pathology.)

DIAGNOSTICS

OB is the most common form of LRTI and the most common cause of erroneous prescription of ABT, and its clinical manifestations are often similar to those of other diseases. That is why the diagnosis of OB simultaneously involves the reliable exclusion of similar diseases, which often have a less favorable prognosis and are characterized by the possibility of etiotropic and pathogenetic therapy.

The differential diagnosis of OB and pneumonia is of particular clinical and prognostic importance . It must be said here that establishing a diagnosis of pneumonia is complicated by the fact that there are no specific clinical symptoms that can be reliably relied upon to suspect this diagnosis. Visualization on an x-ray of "fresh" focally infiltrative changes in the lungs is most often considered as the most important diagnostic and differential diagnostic sign of pneumonia. Unfortunately, there are no clinical symptoms or combinations thereof that would serve as a reliable predictor of radiologically verified pneumonia.

From a formal point of view, acute cough, low-grade fever (body temperature <38.0 ° C), symptoms of URTI (sore throat, runny nose) in the absence of tachycardia (>100/min), tachypnea (>24/min) and local physical symptoms with highly likely to suggest the presence of OB of viral etiology. On the contrary, febrile fever (≥ 38.0 ° C) and/or chills, cough with purulent sputum, chest pain with deep inspiration or cough, tachypnea , local physical symptoms (shortening percussion sound, bronchial breathing, crepitus, moist rales, etc.) support the diagnosis of pneumonia. However, when visiting a doctor at a clinic, most patients exhibit symptoms that fall between the described clinical "extremes", and they are almost always prescribed ABT.

Expectation of purulent sputum in a patient with OB is often mistakenly considered as an indication for prescribing ABT. Meanwhile, according to the results of numerous studies, purulent bronchial

Secretions are a poor predictor of bacterial infection. Thus, when carrying out differential diagnosis between OB and pneumonia, it was shown that the purulent nature of the sputum occurred in 48 and 65% of cases. And since pneumonia accounts for no more than 5% in the structure of outpatient LRTIs, we can conclude that 9 out of 10 adult patients who have a cough with purulent sputum for 1–3 weeks do not have pneumonia [4] .

In older people, pneumonia can acquire an "atypical" course, manifesting itself with a nonspecific symptom complex of OB (cough, sputum production), "unmotivated" weakness or disturbances of consciousness, in the absence of chills, fever, or local physical symptoms. In such a clinical situation, it is necessary to resort to chest radiography as widely as possible, excluding or confirming the presence of pneumonic infiltration.

Of course, chest X-ray cannot be performed on all or even most patients undergoing LRTI, and OB is relatively rarely complicated by bacterial superinfection (including in the form of pneumonia). Therefore, it is necessary to take into account the presence of the following clinical **symptoms that justify the performance of an x-ray examination** :

-heart rate >100/min;
-respiratory rate >24/min;
-body temperature >38.0 ° C;
-night sweats;
- local physical symptoms.

When carrying out differential diagnosis between OB and pneumonia, **a clinical blood test** is a standard laboratory test.

Speaking about the diagnosis of OB, it is necessary to mention the possibility of infection with B. pertussis , especially if the cough persists for a long time. Serological evidence of whooping cough is found in 10–20% of adult patients who have a cough for more than 2–3 weeks . Except for cases where there was obvious contact between the subject and a patient with whooping cough, in an adult patient it is almost impossible to differentiate between "whooping cough" and " non - whooping cough" based on the analysis of clinical data. This concerns the absence of differences in the duration of cough, the frequency of cough paroxysms (including at night), the nature and amount of sputum discharge, the presence or absence of fever, symptoms of URTI, etc. Such a convergence of the clinical manifestations of acute viral bronchitis and whooping cough in adults is associated with the study conducted in vaccination in childhood, which explains the absence of the characteristic symptoms of whooping cough: short-term episodes of spastic cough, followed by wheezing convulsive inhalation (reprises) and often accompanied by vomiting.

Certain difficulties are presented by the differential diagnosis of individual cases of OB, combined with bronchial hyperreactivity and transient ventilation disturbances, and the cough **variant of bronchial asthma** (BA). It is advisable to discuss the possibility of a cough variant of BA in patients with an acute cough lasting more than 2–3 weeks , the absence of diffuse wheezing in the lungs and normal bronchial patency indicators. BA is supported by increased cough at night or in the early morning hours, its appearance during inhalation of cold air, physical activity, as well as positive results of a bronchoprovocation test with methacholine .

Etiological diagnosis of OB is provided by virological and immunological methods. These methods are technically complex, labor-intensive and expensive, so they are used mainly in severe cases and to assess the epidemiological situation. The most reliable methods require considerable time to obtain the final result and, given the short duration of the course of OB, do not solve the problem of actual diagnosis, i.e. are retrospective in nature. For these reasons, the etiological diagnosis of chlamydial , mycoplasma , pertussis and influenza infections in the vast majority of patients with OB is unrealistic. However, during influenza epidemics, the effectiveness of clinical diagnosis of this infection reaches 70%, which is comparable to the sensitivity of commercial kits for rapid laboratory diagnostics (65–80%).

TREATMENT

Antibacterial therapy

Considering that in the structure of LRTI, pneumonia occupies about 5% (and OB - more than 70%), it seems unacceptable that almost everywhere more than 2/3 of patients suffering from an acute respiratory infection receive ABT. It is estimated, in particular, that viral URTIs are an "indication" for prescribing an antibiotic in every fifth case. Taking into account the potential risk of an unfavorable outcome of pneumonia with late diagnosis and delayed initiation of ABT, from a clinical point of view, the consequences of erroneously not prescribing an antibiotic to a patient with pneumonia are certainly more dramatic than its unjustified prescription to a patient with viral OB. However, the level of drug resistance of microorganisms in the population directly depends on the scale of antibiotic use. Therefore, unjustified prescription of ABT leads not only to an increase in direct costs, but also ultimately to a decrease in the effectiveness of drugs available for the treatment of pneumonia. As mentioned above, OB is perhaps the most common disease for which ABT is erroneously prescribed. In the vast majority of cases, OB is caused by respiratory viruses, while bacterial superinfection occurs in a limited number of patients. Meanwhile, in the course of 9 randomized controlled trials conducted over the past 35 years, it was not possible to prove the superiority of antibiotics (erythromycin, tetracyclines, co- trimoxazole) over placebo in the treatment of patients with uncomplicated OB.

meta-analyses of these studies were published . Thus, the duration of cough in patients who received and did not receive ABT did not differ significantly - 6.3 and 7.2 days ($p > 0.05$) [6]. Using a standardized "summary efficacy index," antibiotics were also not shown to be significantly superior to placebo [7]. Finally, the authors of the meta-analysis [8], having excluded three studies from the analysis due to their low quality and lack of results of long-term prospective follow-up, came to a similar conclusion. Summarizing the results of the studies, experts from the Food and Drug Administration (FDA, USA) concluded that further placebo-controlled studies to evaluate the effectiveness of ABT in uncomplicated OB are inappropriate.

It is noteworthy that in some countries, through the use of educational programs for doctors and patients, it was possible to reduce the frequency of antibiotic use in OB from 70–90 to 50%. This was not accompanied by an increase in the number of repeat visits to the doctor, prolongation of recovery times, or an increase in patient dissatisfaction with the quality of medical care.

One of the rare clinical situations in which the prescription of antibiotics to patients with acute cough becomes justified is **suspected whooping cough** . In adult patients immunized in childhood, it is almost impossible to clinically distinguish between viral AB and whooping cough. Therefore, antibiotic prescriptions should be "reserved" for persons with an acute cough and indications of contact with patients with definite or probable whooping cough, as well as in the development of an epidemic of whooping cough. It is recommended to prescribe erythromycin 0.25–0.5 g 4 times a day for 14 days. There is evidence that a shorter course of therapy (7 days) is comparably effective. An antibiotic prescribed not from the first days of the disease has a minimal effect on the dynamics of clinical symptoms, but ensures the successful elimination of B. pertussis from the nasopharynx, thereby preventing further spread of the infection.

ANTIVIRAL THERAPY

Influenza viruses A and B are the most common causative agents of OB, and influenza is the only viral respiratory infection for which antiviral therapy is effectively used.

amantadine, developed in 1966 . Since 1993, rimantadine began to be used for the same indications . The drugs have similar chemical structures. After the influenza virus enters the cell, **amantadine and rimantadine** inhibit the penetration of viral RNA into the nucleus by blocking the activity of the ion channel M_2 protein of the virus.

The effectiveness of antiviral drugs was assessed in patients with uncomplicated influenza, as well as in individuals at high risk of complications (primarily pneumonia). The results showed that amantadine and rimantadine , prescribed within the first two days of the onset of the disease, can reduce the duration of symptoms of infection. To prevent the development of resistance, medications should be discontinued after 3–5 days of treatment or within the next 24–48 hours after influenza symptoms disappear.

The preventive effectiveness of amantadine and rimantadine during seasonal influenza outbreaks reaches 70–90%. Antiviral drugs can also be prescribed to immunized individuals, especially those with risk factors for complications. In adults, immunity develops approximately 2 weeks after vaccination, so amantadine and rimantadine are recommended until protective antibodies appear. In addition, prophylactic administration of amantadine and rimantadine may be recommended for those individuals for whom vaccination is contraindicated.

Amantadine and rimantadine can cause mild adverse events (AEs) from the central nervous system (dizziness, confusion, insomnia) and the gastrointestinal tract (nausea, loss of appetite) and, extremely rarely, severe AEs (delirium, hallucinations, convulsions).

RULES FOR PREVENTION OF CHRONIC BRONCHITIS

- Stop smoking and drinking alcohol
- Limit the entry of harmful substances into the respiratory tract
- When working in hazardous industries, use personal respiratory protection
- Treat infectious diseases promptly
- Avoid hypothermia
- Strengthen the immune system
- During the cold period, when the central heating system is operating, maintain optimal air humidity in the room
- Temper yourself.

CONCLUSION

It is advisable to highlight the main provisions regarding the management of adult patients with OB:

- respiratory viruses are the causative agents of the vast majority of OB cases;
- whooping cough is diagnosed in adults in 10–20% of cases when the duration of cough exceeds 2–3 weeks , however, based on clinical signs, it is impossible to reliably distinguish between whooping cough and other infections in adults vaccinated in childhood; • transient bronchial hyperreactivity is the leading mechanism of persistent cough in OB;
- exclusion of pneumonia is the first priority when examining adult patients with acute cough;
- Numerous placebo-controlled studies have failed to prove the effectiveness of antimicrobial chemotherapy in OB.

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