

Commentary

What role does medical education play today in solving the problem of acute nonspecific pulmonary inflammation?

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Conceptual ideas about the nature of acute nonspecific inflammation in the lungs (ANSIL) and the resulting principles of treatment of this category of patients have been formed and have taken a strong leading position in broad medical practice only over the past few decades. The origins of the currently prevailing doctrine about these diseases arose with the beginning of the use of antibiotics and continued to support the development of this ideology as a result of exaggerating the role and real possibilities of this therapy, considering it as an indispensable and, for a long time, the only means of treatment.

The main characteristics of antibiotics were already known by the beginning of their clinical use, and medical science was unable to detect and supplement them with other fundamentally important qualities of these drugs during the entire subsequent period. For example, the fact that antibiotics are able to act only against certain pathogens of inflammatory processes and do not have a direct effect on the mechanisms of inflammation itself was known at the dawn of this therapy. Even before the appearance of antibiotics in the arsenal of practical medicine, E.P. Abraham and E Chain [1], investigating the isolation of penicillin for release by the pharmaceutical industry, published the results of their work on the rapidly developing resistance of microorganisms to the action of this drug, and its discoverer A. Fleming [2] in his speech during the Nobel Prize presentation warned of the dangers of widespread and poorly substantiated antimicrobial treatment due to the high probability of resistant forms and the development of severe side effects.

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Citation: Klepikov I (2023) What role does medical education play today in solving the problem of acute nonspecific pulmonary inflammation? J Community Med Public Health Care 10: 142.

Received: December 06, 2023; **Accepted:** December 29, 2023; **Published:** December 30, 2023

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The subsequent course of events showed that, despite the well-known prerequisites for the narrowly targeted action of antibiotics, their use was largely influenced by the psychological effect of the first results of this therapy and the desire to revive and preserve its primary pharmacological activity at any cost. Already in the first years of the use of antibiotics, the prophecies of the founders of this therapy began to come true, the results of which marked the beginning of a long-term race in the development and release of new, more advanced drugs [3]. Among ANSIL diseases, the main and leading pathology is acute pneumonia (AP), the causative agent of which in 90-95% of cases in the pre-antibiotic era for many decades was *Streptococcus pneumoniae* [4,5], discovered long before the advent of antibiotics [6].

After the beginning of the practical application of antibacterial therapy, the emergence of such new realities as the steady decline in the effectiveness of these drugs, the emergence of resistant forms of microorganisms and the change of leaders among the pathogens of AP, for a long time did not attract due attention and the necessary assessment of these phenomena. Moreover, for a long time the treatment of acute inflammation of the lung tissue was defined by the term “antibiotics alone”. One of the difficult-to-explain paradoxes of the situation that has been developing for many years is that it took a huge period of time and the loss of antibiotics of their therapeutic role in AP as a result of the appearance of a large number of viral forms of this disease, when just a couple of years ago the World Health Organization finally officially recognized the consequences of the use of these drugs as a worldwide catastrophe [7].

The belated recognition of the burden of resistant microflora as a global problem was in fact nothing more than a forced and inevitable statement of undoubted circumstances that have long become obvious. For a long time, throughout the era of antibiotics, monitoring of the course of events without guiding and mandatory programs to reduce the burden of their side effects was supported due to an unreasonable belief in the indispensability of antibiotics, elevated to the rank of a panacea. At the same time, medicine had no analogues or replacement options for such a common treatment to recommend, if not the abolition of these drugs, then at least a significant restriction of them. The situation that had developed by the time of the development of the SARS-CoV-2 pandemic no longer allowed the leading and responsible international organization to maintain a predominantly observant position. The appearance of a large number of severe patients with COVID-19 viral pneumonia, when even laymen realized that antibiotics were not the means of choice in this situation, forced them to declare the undeniable consequences of this therapy. Such a statement by the long-term coordinator of the world health system, published during the general catastrophe, was rather in the nature of preserving the “honor of the uniform”, as well as a kind of explanation and a veiled apology due to the fact that medicine cannot provide adequate care to such patients. On the other hand, the lack of visible and reliable ways out of the current situation was and remains the main reason for the tacit uncertainty in the principles of treatment of this category of patients used today.

The following facts can serve as confirmation that the last remarks are not unfounded. For example, declaring widespread resistance of microorganisms a global catastrophe, WHO experts express hope for overcoming the resulting catastrophe by developing even more advanced etiotropic drugs. It is easy to see that the essence of such a proposal very much depends on the evaluation of antibiotics as an indispensable tool and considers further improvement of precisely those reasons that ultimately led to the development of the problem under discussion. Moreover, this point of view reflects the narrowness of existing approaches to solving the problem of AP, when all attention is focused on suppressing the suspected pathogen, which in most cases remains unidentified [8], while the process of inflammation is not considered as the main cause of dysfunction of the affected organ. The practical implementation of such an ideology is, for example, the fact of an approach to etiotropic treatment of patients with COVID-19 pneumonia during a pandemic. Thus, during the hospitalization of patients with coronavirus inflammation of the lung tissue, the parallel presence of bacterial or fungal infection was detected only in a few percent of cases, but more than 70-80% of patients with COVID-19 pneumonia received antibiotics [9-11].

These examples reflect only individual segments of the general ideology in assessing and trying to solve the ANSIL problem, but they begin to shape our understanding of the contradictions and misconceptions that have distorted the doctrine of these diseases. In such circumstances, only a deep, detailed and critical analysis of the misconceptions that have arisen in the way of solving this problem can help. More than four decades ago, when the problem of a noticeable decrease in the effectiveness of AP treatment began to manifest itself in certain regions, the author of these lines began such work, which eventually showed the importance and decisive importance in achieving the success of a radical revision of views on the nature of the disease. The results of the conducted research and convincing clinical approbation, which have been summarized and published, acquire important didactic significance today and allow us to understand the causes of modern failures in the treatment of this category of patients [12]. However, the results obtained and the success achieved so far are only an open proposal and a good intention of the author, since there are many obstacles to further promotion and implementation of these approaches.

Every year, medical faculties of universities and medical colleges around the world produce a huge number of new future specialists who, during their training, receive clear instructions in accordance with the ANSIL section to consider pathogens as the main cause of these diseases, and etiotropic therapy as the main type of treatment. It is easy to see that the curricula for this section of medical knowledge are compiled in this way by looking at the contents of numerous textbooks and manuals in which the presentation of these diseases over the past decades has been subjected only to "cosmetic" correction in accordance with the dynamics of their etiology. Teachers are unlikely to deviate from the basic principles set out there on this topic, which have been widely accepted in recent years as a mandatory standard. Future specialists who have shown interest in acquiring a medical specialty are fertile ground for initial training, and the primary knowledge obtained serves as the basis for further expanding their professional horizons. Starting the practical implementation of the acquired knowledge, a huge army of novice doctors initially has narrow ideas about the nature and mechanisms of AP development, which do not take into account many fundamental and specific factors of this disease. It is worth noting as examples only some of the most important

features of this disease, which have an undoubted impact on clinical dynamics, and the neglect of their role reflects learning defects.

Thus, the severity of the condition of patients with AP still continues to be considered from the standpoint of virulence of the pathogen, although long-term attempts at differential diagnosis of not only bacterial inflammation in the lungs, but also recent attempts to differentiate bacterial and viral forms show the futility of this diagnostic direction [13,14]. At the same time, such an unavoidable classic sign of inflammation as loss of function, the role and significance of which for the severity of clinical manifestations have been proven by centuries of practice, is taken into account in AP only in connection with a violation of gas exchange. At the same time, for example, the role of pulmonary vessels in the regulation of systemic circulation, capable of autonomously and automatically maintaining the equality of cardiac output by two ventricles and the inverse proportion of blood pressure in two circulatory circles, is in no way represented in the modern concept of the disease. Therefore, the shock that is observed in aggressive forms of AP is currently considered septic, although it has a completely different cause of development and the lack of convincing evidence of septic nature, which explains the low effectiveness of its modern treatment [12]. The latter circumstance explains the unjustified increase in the number of patients with sepsis and septic shock, the overwhelming number of whom in this group today are patients with AP [15,16].

It is quite obvious that the situations described in the examples given reflect the obvious contradictions of modern conceptual ideas about AP to the fundamental foundations of medical science. There may be objections that if this were the case, then in the process of accumulating practical experience, specialists would sooner or later pay attention to this and try to eliminate such inconsistencies. However, in modern practical medicine, there are serious and practically "insurmountable" obstacles in the form of established standards of examination and treatment of patients who are included in the monitoring zone by administrative authorities and insurance companies. In this regard, the doctor will not risk his image and achieved position, even if he has reasonable doubts about the adequacy of the principles of treatment used today. Every time, departing from the generally accepted and recommended standards of medical care, a modern specialist finds himself in an extremely dangerous situation. Insufficiently effective treatment in such cases and the filing of complaints about this by the patient or his relatives really create for representatives of medicine the prospect of both administrative and financial sanctions, not to mention moral upheavals. Therefore, to expect individual manifestations of initiative in the conditions of the existing situation seems rather extraordinary than the natural course of events.

But this is not the only barrier that supports the defects of educational programs and prevents the solution of the problem under discussion. It is well known that in emergency situations, the rejection of template approaches and individual initiatives that go beyond what is permissible often allow you to find a way out of a difficult situation. However, such a breakthrough did not occur during the pandemic. In this regard, it should be noted once again that the beginning of the practical use of antibiotics launched an unprecedented process of dynamic changes in the etiology of AP, which a couple of decades ago led to a situation where viral forms of the disease, which were previously relatively rare, reached almost half of all cases of this nosology in the world [17-19]. It is interesting to note that after summarizing the above statistics, the first coronavirus epidemic was observed, but

all these transformations did not lead to a change in treatment approaches, and antibiotics continued to play a major role. According to the conclusion of experts from the Centers for Disease Control and Prevention, in the USA up to 50% of antibiotic prescriptions and their use were accompanied by violations of the conditions of this treatment [20,21], and in France expert assessments showed that the use of these drugs in intensive care units in 30%-60% of cases were unjustified [22].

The long-term continuation of such a therapeutic strategy could not remain without consequences. Widespread and prolonged intervention of antimicrobial therapy in one of the usual balances of nature manifested itself in the form of signals of an increase in repeated outbreaks of viral infections, eventually “giving” us a pandemic. And if the “unforeseen” and unexpected nature of this catastrophe, as well as various conspiracy theories and even the possibility of sabotage from a professional point of view have not received scientific confirmation, but continue to be discussed on social networks, then the role of modern medicine during such an extreme and rather long-term phenomenon should force experts to treat this problem deeply and critically. The absence of any real proposals to change the treatment outcomes of this group of patients during the SARS-CoV-2 pandemic and the continued widespread use of antibiotics as the main remedy for viral inflammation (see above) are a reflection of the fact that didactic distortions of the AP concept have reached their peak. Erroneous ideas about excessive expectations from the effect of etiotropic therapy, on which a huge galaxy of specialists were brought up, not only influenced the nature of the professional worldview, but also by now have turned into a mental guiding dogma that completely determines the strategy of decisions made, despite their frequent inconsistency with existing facts.

The preservation of the existing concept of the disease, which contradicts the provisions of fundamental medical science, and the further introduction of medical care based on it may lead the prevailing conditions to a more severe unpredictable catastrophe, compared to which the newly experienced manifestations of the COVID-19 pandemic will be perceived as moderate inconveniences. Both the change in biological conditions and the dominant professional views on the ANSIL problem today have persisted for many decades, with the gradual introduction of such an etiological strategy into the category of official rules. Currently, medicine faces a very difficult task to eliminate the prevailing stereotypes in this section. Critical analysis, discussion and decision-making on changing such an odious doctrine of these diseases requires the joint work of specialists from various fields with the involvement of administrative and legislative resources. The nature of the current situation shows that this issue requires, first of all, a change in the professional training of future specialists and a new perception of the problem under discussion.

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