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The Solution to the Problem of Acute Pneumonia Today: Progress or Stagnation?

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INTRODUCTION

Successful treatment of any disease depends primarily on the depth of our understanding of the nature and causes of the disease and the mechanisms of its development. This definition reflects the quality of care for patients at all stages of medical development and is not debatable. From this position, we can expect excellent results in the treatment of patients with community-acquired pneumonia (CAP). After all, CAP is one of the oldest nosologies in medicine, which since its first description by Hippocrates has been the subject of observation and study of specialists in different directions. The experience gained over two and a half millennia and the deepening of basic knowledge about the unique features of the respiratory system give grounds for such optimistic hopes. In addition, acute nonspecific inflammation of the lungs has always belonged to the category of severe, but not fatal diseases. Long before the advent of antibiotics in medical practice, many patients tolerated it without any purulent complications. It was well known that CAP was not a contagious disease and that these patients did not need isolation and other sanitary precautions.

However, such logical expectations do not correspond to the current state of the problem. Here are just a few quotes from publications in recent years.

“Community-acquired pneumonia (CAP) is a frequently observed, costly health issue causing significant morbidity and mortality. The incidence of CAP requiring hospitalization is about 25–30 cases per 10,000 adults and, in the USA, constitutes the seventh most frequent cause of all-cause death. Among infectious diseases(highlighted by me), CAP is the most frequent cause of hospitalization and mortality in industrialized countries” [1].

“Community-acquired pneumonia (CAP) represents an important public health problem and carries significant morbidity, mortality, and costs. The incidence of CAP is highest among children and elderly patients, but the mortality is much higher in patients older than 65 years. Despite the advances in medicine, the administration of antimicrobials, and the overall better care, there are still patients with CAP dying due to systemic complications all over the world” [2].

“Mortality rates for severe community-acquired pneumonia (CAP) range from 17 to 48 % in published studies…. Severe CAP has claimed too many lives for too long. The emergency medicine and respiratory and critical care medicine communities should work together to decrease mortality by implementing early and aggressive management measures upon recognition of severe CAP” [3].

“Severe community-acquired pneumonia (CAP) remains a frequent reason for admission to hospital. It is the most common cause of septic shock requiring escalation to treatment within an intensive care unit (ICU). Despite earlier recognition and recent advances in supportive care, severe CAP is still associated with substantial morbidity and mortality, more often seen in the elderly and those with considerable comorbidities….Despite the advancements in supportive care, severe CAP remains a common reason for critical care admission that is associated with a high mortality” [4].

“Pneumonia remains the leading cause of death in children outside the neonatal period, despite advances in prevention and management” [5].

“Community-acquired pneumonia (CAP) is the infectious disease(highlighted by me) with the highest number of deaths worldwide” [6].

Community acquired pneumonia remains a common cause of morbidity and mortality…. Optimal treatment remains a matter for debate, especially in very sick patients, including the role of combination antibiotic therapy and corticosteroids [7].

The above quotes are typical of analytical and review articles on this topic in recent years .At the same time, some reports of a slight decrease in morbidity, complications and mortality in this group of patients are considered to be a great and promising success, although the dynamics of these indicators in the world statistics of recent years is a well-founded concern of specialists, and the ideology and strategy in solving this problem remains unshakable for decades. But it is the system of ideas about the causes and mechanisms of the disease that serves as a justification for targeted and adequate treatment, which ultimately determines the final result.

However, can we talk about the modern dominant view of the nature of CAP as a system of views? I am not afraid to say that, from my point of view ,such a system of views does not exist, and the whole modern concept of CAP is to identify and compare its various pathogens. For example, in Wikipedia all the description of the causes and mechanisms of CAP development was literally in one line-"Pathophysiology. CAP's symptoms are the result of lung infection by microorganisms and the immune system's response to the infection"[8].

In monographs, textbooks and manuals, as well as in many journal articles, the section of causes and mechanisms of CAP development is usually presented with a detailed list of characteristics of the most common pathogens, followed by recommendations for choosing the most optimal antibiotic. But, one thing-a detailed presentation of microbiological aspects on paper and quite another-how it is implemented in practice." Usually, the causal organism is not identified and treatment remains empiric"[7]. To date , more than one hundred possible pathogens of CAP are known[8], which is much higher than is usually given in the literature, and the vast majority of such patients worldwide are cured without determining the true pathogen of the process. This fact is obvious and well-known, but all the failures in the treatment of these patients continue to be explained by the characteristics of the pathogens without proper confirmation by the results of bacteriological studies. Determination of a specific pathogen Determination of a specific pathogen of CAP, as a rule, is possible only in the group of patients with purulent complications of the process. But, in most of these statistics are usually present observations in which the bacteriological study of pus is sterile. You can find various explanations for this fact, but no one considers "sterile empyema" as a result of the active development of pathogenetic mechanisms of the inflammatory process against the background of effective (!)antibiotic therapy.

Thus, analysis of the current state of the problem of CAP allows us to state the fact that the dominant concept of the disease today is mainly declarative and does not have sufficient arguments in clinical practice of its reasonable expediency. Each specialist can easily come to such a conclusion after a detailed study of literary information in comparison with the results of the practical implementation of the proposed projects and recommendations. From my point of view,the modern ideology of ATS not only does not give any positive results for clinical practice, but, the contrary, long been a major obstacle to the real solution of this problem. The persistent recognition of the exclusive role of pathogens for clinical manifestations and the development of complications deliberately adjusts the thinking of researchers to a narrow approach and prevents them from looking at the problem from other points of view.

Constant attention to the microbiological aspects of the problem with periodic updating of this information in accordance with the current period has logically and imperceptibly led to the fact that in recent years, CAP has become considered as an infectious disease. From the standpoint of modern concepts of the disease, this interpretation is natural, as it emphasizes the important role of pathogens. However, this innovation does not reflect the actual position in this section of medicine. CAP throughout its history has never belonged to the category of infectious diseases, and even more so was not considered a contagious process. Today, patients with pneumonia are also not yet subject to isolation or other mandatory sanitary measures. However, the detection of antibiotic-resistant strains in such patients brings them to the group of potentially dangerous and implies the implementation of anti-epidemic measures. If the scientific ideology of CAP does not undergo a radical revision in the near future, and the theoretical intimidation of the banal microflora will continue, then not far off is the time when all patients with acute pneumonia from the moment of diagnosis will be regarded as potentially dangerous to others.

The origins of modern scientific and clinical perception of CAP originate in the recent past and are associated with the beginning of the use of antibiotics. The emergence of antibiotics in the Arsenal of medicines has become one of the greatest achievements of medicine of the last century. These drugs have already saved and continue to save millions of lives. The effectiveness of antibiotic therapy in the early years of its implementation was so high that it is usually not required the use of additional drugs or other means of assistance. Many patients with severe inflammatory diseases were cured at that time after just a few injections of antibiotics. All this created a certain atmosphere of euphoria and a false impression that finally found a universal cure for inflammatory processes of

bacterial etiology. Training programmes for medical personnel on acute pneumonia have been revised and adapted to new realities. Since then, antibiotics, as a means of suppressing pathogens, are often defined as the only way to treat ("antibiotics only"), and the nature of CAP is interpreted only in terms of the Microbiology of the process.

Along with the undoubted success of antibiotics, another process has been launched, which requires more time for its manifestation and which has obvious negative consequences. In this case, we are talking about the intervention of antibiotics in the usual balance that existed between the macroorganism and its symbiotic microflora. In the initial period of antibiotic use, the prerequisites for their negative role for the symbiotic microflora have not yet been taken into account. For example, it is impossible to achieve complete and long-term sterilization of the macroorganism and other varieties of microbes should take the place of destroyed symbionts. In addition, bacteria are biological objects that can adapt to new conditions of existence [9].

As a result of this effect of antibiotics, we can state to date the periodic change of leaders among the pathogens of CAP and the emergence of a whole group of antibiotic-resistant strains. These processes are running and cannot be stopped or avoided. It should be noted that pharmaceuticals in this conflict with microbiological dynamics will always remain a catch-up party. The above-mentioned reasons are already visible to the naked eye and are a significant obstacle for the adequate antibiotic therapy of CAP.

The lack of a clear understanding of the mechanisms of acute inflammation in the lungs is especially noticeable in situations where additional treatment is required. If the initial therapy, which is now called "antibiotics alone", is insufficient and the patient is sent to the hospital, then the addition of intensive therapy is due to General Therapeutic techniques without taking into account the specifics of the process in the lungs. Such an automatic transfer of General techniques to the inflammatory process, which among all forms of bacterial inflammation is the only one in the small circle of blood circulation, may have the opposite effect [10]. As you know, small and large circles of blood circulation have not only a direct anatomical connection, but also a reverse functional interdependence. Therefore, the use of techniques that have a positive effect on other diseases, requires a preliminary test of their action in the conditions of CAP.

However, for future patients need a solution to the problem, not a statement of facts. I believe that there is such a solution and it is only waiting for the beginning of its broad implementation.

Now it has been more than 40 years since the author of these lines was in an unusual situation. As a young pediatric surgeon, he had to treat a large group of very severe non-surgical patients. Why patients with initial forms of aggressive pneumonia were sent for hospitalization to the surgical department is a story for a separate message. In the Department at the same time could be up to 10-15 and even more patients who were characterized by rapid development of pleural complications and high mortality of more than 10%. A large number of severe patients with CAP were explained, in particular, by the extremely unfavorable environment of the air basin in the region . Today, these memories are perceived simply as a nightmare from the past, but at that time the situation was very tense and required the search for adequate and effective solutions. This solution was found primarily as a result of a radical revision of ideas about the nature and mechanisms of CAP development.

To conduct such an audit and create a new doctrine of the disease, it was only necessary to recall the axioms, laws and facts that are well known to medical science. Experiments on animals and various additional studies to clarify some links in the pathogenesis of CAP were carried out. The result of this work was the creation of a holistic and scientifically based doctrine of CAP. A new understanding of the causes and mechanisms of acute nonspecific inflammation in the lungs was the scientific justification for the revision and refinement of the complex of medical care. In addition, the impact of some methods has been objectively verified.

During these studies, the monitoring and treatment of 994 children with CAP and various destructive and pleural complications were analyzed. Revised recommendations for treatment were applied in 203 patients in the initial period of aggressive forms of CAP. The results indicate the possibility of guaranteed prevention of purulent-destructive complications of the disease.

The results of the work, including the summary, were originally published in Russian [11] and only in recent years have these materials been translated and published in English. The most complete and detailed description of the previous work is presented in the recently published monograph [12].

To date, the problem of CAP in the world not only has not lost its relevance, but, according to available information, has become more urgent. His strategic decisions were not proposed. Continued calls for better bacteriological diagnosis and the development of more effective antimicrobials are only tactical and have been the main focus of the problem for many years.

Real progress in this field of medicine can only be achieved by

revising the entire strategy of the disease. A comprehensive view of the causes and consistent, interrelated mechanisms of the disease will determine the nature and direction of treatment efforts. The seeming simplicity and ease of execution of this decision, in my opinion, is very deceptive. For several decades, medical personnel have been trained in the light of the exceptional indispensability and omnipotence of antibiotics, and in recent decades also in fear of the banal microflora. Changing the existing worldview is a very difficult task, and I think it will take quite a long time to change and reshape the view of this problem, which has evolved over the years and has been directed in only one easy-to-understand direction.

In addition, there is another serious barrier to success in new approaches to the treatment of CAP. Today, official medicine anywhere in the world is based on adopted and legalized recommendations and regulations that determine the volume and nature of medical care, depending on the nosology. Therefore, the process of changing views on the nature of CAP and approaches to its treatment should go in two directions. First of all, new programs of this section for University students and information courses and seminars for certified doctors are needed. In parallel, the tests of this section, as well as legalized recommendations and requirements, should be revised.

The novelty of the developed doctrine of CAP lies only in the proposal to consider the causes and mechanisms of the disease from a different point of view. In fact, the proposed doctrine is based on long-studied and well-known scientific facts. Ignoring biological laws is a big omission in the study of a disease. These laws, regardless of our attention, inevitably have an impact on the development and course of the painful process.

The observed dynamics of the problem of CAP for several decades and the continued loss of antibiotics(as a leading treatment) of their initial positions indicate the need for a scientific review of views on the nature of the disease and the subsequent change in the treatment complex. This work should begin today, as it will take a long time to obtain and evaluate the first results of this restructuring in General practice. In the initial period of this work, you can use the participation and experience of the author of these lines, which he is ready to share and help with joy and a sense of medical duty.

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