

Acute Pneumonia and the Hidden Effect of Antibiotics

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ABSTRACT

The use of antibiotics marked the beginning not only of the side biological effects of these drugs, but also had a strong impact on changing professional views on the problem of acute pneumonia. Currently, the concept of the disease is focused on its etiology, leaving other factors and mechanisms of its development without due attention. This circumstance narrows the range of ongoing research and the search for solutions to the problem of acute inflammation of the lung tissue.

Key words: acute pneumonia, antibiotics, the concept of the disease.

INTRODUCTION

The successful solution of any problem depends, first of all, on the ideas about its essence, from which the goals and objectives of the upcoming research are formed. The modern concept of lung tissue inflammation, which arose under the significant influence of the use of antibiotics, is selective and ignores the fundamental materials of medical science. To solve the problem of this pathology, it is necessary, first of all, to revise existing views in this direction, without which success is unthinkable.

The history of treatment of acute pneumonia (AP) is divided into two fundamentally different periods. Initially, for many centuries, medicine accumulated information about the methods of treating this disease, which was scrupulously obtained empirically. The constructiveness of these searches was very difficult and limited due to a lack of scientific information and insufficient technical support for clinical trials and research. Nevertheless, for a long period of time, there was a certain trend in the set of means of providing assistance to this category of patients.

The second period of this history began in the middle of the last century after the discovery of antibiotics and

completely changed the principles of AP treatment. The success of antibacterial therapy began to form the idea that medicine has received a universal and effective treatment. The centuries-old experience of helping these patients was no longer taken into account, and the previous methods were discarded. In this situation, there was no room for a critical and balanced forecast of the long-term consequences of such “sterilizing” therapy. For a long time, the main treatment of AP was defined by the term “antibiotics alone”. The short-sightedness of such a strategy became more and more obvious every year, but the desire to restore the former effectiveness of antibacterial therapy prevailed over a reasonable and balanced analysis of the natural biological consequences of this drug intervention.

Over time, the use of antibiotics and their effect on the microflora that accompanies our body has significantly expanded not only as a result of medical prescriptions. For example, many people know about the use of these drugs in such branches of the food industry as animal husbandry, poultry farming and even fishing. In this regard, many countries have adopted laws and regulations that oblige manufacturers to provide information about the use of these medicines in the production of the final product (Figure). The widespread and long-term use of antibiotics could not remain

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Figure. Food packaging with information about the use of antibiotics in the production process.

without biological consequences, which continue to progress slowly but steadily.

Such biological consequences of antibiotics as a decrease in their therapeutic effectiveness and an increase in the resistance of microflora are well known not only to specialists. These side effects of this type of therapy are constantly discussed not only in the specialized literature, but also often in the media. However, in this context, we are talking about a specific consequence of long-term use of antibiotics, which does not appear at all in discussions on this topic. The potential impact of the excessive authority of these drugs on the long-term training of medical personnel and the formation of a new AP ideology is a serious and difficult obstacle to solving the problem.

The world view on the problem of AP, which has developed over the past few decades, proclaims concepts and ideas that do not correspond to the basics of medical science and the objective facts of the surrounding reality. But, since the AP concept is the key to solving the problem and the actual guide to finding optimal ways, the significance of the didactic consequences of the long-term priority of antibiotics seems to be the main barrier that no one has yet overcome. The leading provisions of the modern AP doctrine are accepted in medical circles as indisputable, despite the presence of new and new counter arguments.

Has anyone written that long-term dependence on antibiotics in the treatment of AP forced us to consider the microbial factor as the main cause of the disease, and the inflammatory

process in the lungs, which has never been contagious, to be attributed to infectious nosologies? For many years, the main task in the treatment of AP was considered to be the accurate diagnosis of its pathogen and its targeted suppression. The failure of these efforts has become apparent only recently, although the general medical principles have not changed (1,2).

At the same time, the concentration of attention on this narrow direction prevented the manifestation of due interest in the steady growth of viral forms of AP (3-5). In addition, if we take into account the main biological effect of antibiotics, it is quite reasonable to imagine their role in disrupting the proportions of the microcosm around us and increasing the proportion of viruses among the pathogens of inflammatory processes. It takes time to confirm this postulate, but even now the events of the last decades are quite convincing in favor of this version.

For example, the SARS-CoV-2 pandemic, which is presented in expert assessments as a sudden catastrophe, may well be considered from a different point of view as the result of a long-term suppression of microbial representatives of our microbiota and the environment through the widespread use of antibiotics. This phenomenon, judging by the sequence of events, should at least have been expected. What suddenness can we talk about if the development of the pandemic was preceded by two major epidemics of coronavirus infection (SARS, MERS), the experience of which did not lead to the emergence of new fundamental decisions in providing care to these patients. Almost twenty years have passed since

the first such epidemic. This is a significant period of time during which the trend towards severe epidemics of influenza and other viral respiratory diseases continued to increase. However, all these years, the strategy for solving the problem of AP continued to be determined by the leading role of pathogens in the development of the disease and the primacy of antibiotics in treatment.

The peculiarities of antibiotics that have only an antibacterial effect and do not affect the vital links of pathogenesis do not allow us to consider them as the leading and even more so the only means of treating AP. At present, when there are a large number of patients with COVID-19 pneumonia, in whom antibiotics have lost their therapeutic value, it would seem that the time has come for a radical revision of the ideas about many important aspects of AP and bringing the views in line with fundamental scientific materials and facts.

The instructive nature of the current pandemic is manifested in a number of new circumstances that should become an incentive for revising the previous stereotypes of treating patients with acute inflammatory processes of the lungs. First, the hope for the usual leading role of antibiotics in the treatment of a new type of AP has disappeared.

Secondly, bacterial forms of AP, despite their interpretation in recent years as an infectious disease, were not subjected to isolation and other anti-epidemic measures during hospitalization. Now, the ease of the spread of the coronavirus and the uncertainty of successful treatment force such patients to concentrate in specialized closed departments for this purpose. Such a concentration of severe and extremely severe patients with one disease increases the possibility of a broad professional assessment of the dynamics of the process and the corresponding conclusions. However, so far, work in the coronavirus control units only carries a heavy moral burden on the service personnel (6-9).

Third, statistics inexorably indicate that the loss of the target role of antibiotics in the treatment complex did not significantly affect the results. Thus, among those infected with coronavirus, only 20% need hospitalization and medical care. The remaining 80% tolerate such contact in a mild form, and many people only find out about it through tests (10-13). The mortality rate among patients with COVID-19 pneumonia also did not increase compared to this indicator among hospitalizations with community-acquired pneumonia (14-20).

These facts give an unambiguous hint that the pathogen of AP is not the main cause of the disease, and etiotropic treatment does not significantly affect the final results. The logic of current events indicates the need to revise the current concept of the AP, starting with its main provisions. The most

important information for such a revision is the anatomical and functional feature of the lungs, which allows us to understand why the mechanisms of development of general circulatory disorders in inflammation of the lung tissue have an effect opposite to the influence of inflammatory foci on the periphery, but which is mostly ignored.

However, the facts of reality indicate that the desire to preserve antibiotic therapy as the leading type of treatment, despite the changed conditions, prevails over logic and meaning. According to the available information, the absence of the need to use antibiotics against a viral infection does not prevent their appointment.

For example, bacterial infection, the methods of determining which for many years have caused great doubts about their reliability, is detected only in a few percent of cases among patients with COVID-19 pneumonia. At the same time, antibiotic treatment is carried out in more than 70-80% of these patients (21-24). Sometimes the old stereotypes of providing medical care in the new conditions are not revised at all, and patients with coronavirus infection are automatically included in the treatment regimen for community-acquired pneumonia (25,26). However, it is no secret that the main emphasis in such treatment regimens is on antibiotics.

But not only the practical implementation of medical care in the context of a pandemic has not undergone the necessary correction. The monopoly of old ideas remains a big obstacle when conducting new research on the problem raised. For example, the antibiotic "azithromycin" has been used in medicine for more than 30 years not only for bacterial forms of AP, but also for middle ear inflammation, streptococcal pharyngitis and even diarrhea (27). Currently, this drug, which does not have proven antiviral activity, is undergoing clinical trials against the coronavirus. Only the inviolability of the previous doctrine of the disease, which was formed as a result of excessive evaluation of antibiotics, can explain the fact that, having received no evidence of the beneficial effect of azithromycin against coronavirus, the authors propose to continue this study (28).

Antibiotics are still one of the most popular medicines. Their action, unlike other representatives of the pharmacopoeia, is directed not at the structures and substances of the body, but at its microflora. At the same time, each representative of the microbial world is itself a separate biological object. It is these circumstances that can explain the fact that the same antibiotic can help as a general therapeutic agent for diseases that are completely incomparable in pathogenesis. However, with such a narrowly focused "sterilizing" therapy, even if it is effective, the elimination of functional and morphological disorders remains completely a problem of the body itself.

The era of the use of antibiotics in medicine has brought not only the salvation of many human lives, but also the side effects of this therapy. The antibiotic-resistant transformation of the microflora and the need to develop new more effective medicines have especially increased in the last 2-3 decades. The biological consequences of the widespread use of antibiotics have already passed the point of no return. They should be perceived as a persistent phenomenon that will continue to develop, and this trend can only be slowed down a little by introducing much stricter measures for the prescription and use of antibiotics. At the same time, the growing role of viruses in our environment is becoming more and more obvious, which requires awareness and appropriate correction of medical strategies.

CONCLUSION

Despite the colossal biological effects of the side effects of antibiotics, they represent only the tip of the iceberg of a common problem. In order to understand the depth and significance of these consequences, as well as to develop fundamental plans for future research and implement effective solutions, it is necessary, first of all, to realize and eliminate the negative didactic influence of this type of therapy on the formation of a professional worldview. The narrowness of existing ideas about the nature of AP is becoming more and more obvious every year, remaining the main obstacle to achieving the desired goals. This is the only consequence of antibiotics that can be corrected, and its correction depends entirely on each of us.

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