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Acute Pneumonia as a Reflection of the Unity and Struggle of Two Biological Systems (Some Facts and Axioms)

Letter to Editor

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The choice of solution to any problem is defined by conventional and dominant system of views on the essence of the problem. This belief system can be formed under the influence of temporary achievements and to be the leading Directive for many years. A vivid example of this misunderstanding, from my point of view, can serve as modern approaches in the treatment of acute pneumonia (AP).

The basic principle of treatment of AP over several decades is defined as "antibiotics alone". Thus nobody pays attention to the fact that the attending physician may prescribe the same antibiotic in different patients, who appealed to him about the fundamentally different diseases by localization and mechanisms of occurrence. Such curative efforts reflect the prevailing belief that the same medicine can cure many different diseases. While specific treatments of specific diseases are being forgotten. These treatment guidelines remain unchanged since the advent of antibiotics in the Arsenal of medical means. During this long period of time, changes concerned only the replacement of certain groups of antibiotics on others. If this approach to the treatment of AP has brought a consistently effective results,then there would be no reason to dwell on this and open the discussion [1-4].

However, a slow but constant trend of deterioration of results of treatment of AP are discussed in the literature for many years. A few quotations from the publications of recent years can serve as an additional explanation of the problem.

"Community-acquired pneumonia (CAP) is one of the 10 leading causes of death worldwide. Approximately 20% of CAP patients require hospitalisation, 25% of whom are admitted to an intensive care unit (ICU) and have a mortality rate of 30 - 50% [5]". "Pneumonia is a leading cause of hospitalization among children in the United States, with medical costs estimated at almost $1 billion in 2009. Despite this large burden of disease, critical gaps remain in our knowledge about pneumonia in children [6]".

"The rates of parapneumonic effusion have been increasing in the USA and Europe over recent years, and it is now encountered in approximately 40% of all patients with bacterial pneumonias [7]". "Pediatric pleural empyema has increased substantially over the past 20 years and reasons for this rise remain not fully explained [8]".

Not so much a statistic as a lack of scientific explanation raises serious concerns regarding the prospect of solution of this problem. In this connection, it is recalled that World Health Organization has spent 39 billions of dollars in 2010 - 2015 years to solve this problem [9]. If this costly program have yielded significant results, we'd know about it from all media. However, disclosure of the results of this large-scale events were not conducted, indicating the absence of revolutionary solutions.

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Already at least two decades the population of developing countries receives a "vaccination against pneumonia". The view that such injections can prevent serious forms of AP, is common not only among the population but also among health care workers. But the results that were obtained after years of total vaccination of the population, have put medical science to a standstill. The latter conclusion needs to be accompanied by the following quotations from research.

"Among children ≤ 18 years of age, the annual empyema-associated hospitalization rates increased almost 70% between 1997 and 2006, despite decreases in the bacterial pneumonia and invasive pneumococcal disease rates. Pneumococcal conjugate vaccine is not decreasing the incidence of empyema" [10].

"Despite decrease in pneumococcal diseases among Utah children, complicated pneumonia/empyema has increased during the 7-valent pneumococcal conjugate vaccine era"... "The causes on increasing rates of empyema are unclear" [11].

"Antibiotics alone" as the principle of treatment of AP determines not only the narrowly focused medical care, but also supports the supremacy of the microbial factor in the perception of the nature and causes of the disease. Fear of a specific pathogen AP has a specific history of the past decades.

At the beginning of my medical career, I took a time when all purulent or destructive complications of AP attributed only a staph infection. When *Staphylococcus aureus* began to lose the leading position, some researchers rushed to declare victory over him. The final outcome of this confrontation is known: the "winners" received a trophy MRSA, *Staphylococcus* has retained its place in the etiology of AP and its purulent complications, and MRSA is often detected in healthy humans as a "shocking" representative of symbiotic microflora [12].

The era of *Staphylococcus* in the etiology of OP has been changed to era of *Streptococcus*. The assertion of the dominant role of *Streptococcus* in the etiology of AP is clearly exaggerated and contrary to known facts. First, the vast majority of patients with AP heals now without any attempts to identify the causative agent. Therefore, automatic detection of such cases as a result of pneumococcal infection in the absence of concrete results is simply incorrect and groundless. Bacteriological examination of material from the zone of inflammation becomes available in case of purulent complications. Only results of such studies reliably determine the causative agent of process in the lung. However, numerous recent publications on this topic point to participate in the different proportions of the various representatives of nonspecific microflora. We should pay attention to the high percentage of so-called sterile crops. These sterile crops suggests that antibiotics suppressed microflora in the epicenter of the disease, but despite this, the inflammatory process could not be stopped and he has reached the stage of purulent complications. This fact is important for analysis, evaluation and understanding of some features of AP (the ratio of the pathogen to the severity of the inflammatory changes, the individual intensity of inflammation, the influence of therapeutic procedures on the dynamics of inflammation, etc.).

Recently there is evidence about the increasing role of viruses in the etiology of AP, which is already beginning to outpace bacterial flora. Again, you should pay attention to this interesting fact as the lack of significant difference between healthy and sick AP in the prevalence of these viruses [13,14]. The increasing role of the viruses among the pathogens of AP may create additional problems that will be caused by the necessity of development and implementation of new specific resources. If that prospect starts to come to life, even in case of a comprehensive drug supply statistics of the outcome of treatment will not improve. It is possible the changes will apply only to treatment tactics.

The above characteristics of the problem of the AP can create the impression of complete hopelessness in the attempts of solving it. However, the solution to this problem is, I am convinced based on my own research and experience. Required ways of solution of problems of the AP are related to a radical change in strategy views on the nature and pathogenesis of the disease.

Medical science has, to date, a large amount of diverse information, which is publicly known, is directly related to the problem of the AP, but it remains in this section of medicine unclaimed. On the one hand, our body is a complex biological system and has the self-regulation processes. Through these processes, many factors of external influence and internal changes remain for us imperceptible. But each of us has their own uniqueness. Therefore, the elusiveness of such effects is for each individual to its own band.

When a balanced system in our body is out of balance, the resulting state is accompanied by the emergence of new characteristics and sensations, and the various systems of the body begin to work in a different mode. This classical path is characterized for the development of all diseases, but the difference between them is determined by the location and nature of the primary infringements. In this context, the emergence and development of AP requires an assessment of a number of scientific facts that already are in the nature of medical axioms.

1. The body's response to any stimulus, including the initiation of inflammation, is highly individual and unique.
2. The basis for the inflammatory transformation of the body tissue is a vascular reaction with a specific stage sequence.
3. Small and big circles of blood circulation not only have a direct relationship,but an inverse relationship.
4. Among the nonspecific forms of inflammation, AP is the only process occurring in the system of lesser circulation.
5. The same medical procedure can have different effects on inflammation in the small or big circles of blood circulation [15-18].

Already this incomplete list of scientific facts gives an a priori idea that only the suppression of the microflora in the inflammation will not be sufficient assistance for a variety of patients with AP.

On the other hand, the human body exists in close contact and balance with its microflora as a second biological system. Symbiotic microflora in healthy people has individual characteristics. So, a certain percentage of the population are carriers such as the original non-specific microorganisms of antibiotic-resistant strains. This carriage is one of the options a stable combination of two biological systems. Moreover, the appearance of such strains is a striking example of adaptation of these biological objects to external drug aggression. In practice, the resistance of microflora to antibiotics becomes important only in case of development of inflammation and the need for its suppression.

Violation of stable equilibrium between the two biological systems can be caused by a change in the status of each, and the intervention of additional factors. Possible changes of symbiotic microflora of the body are accompanied by corresponding irregularities in his condition. All these States are well known and understood. For example, the shifts in percentages between different symbionts referred to as dysbiosis, which has its own clinical picture. Getting outside bacteria that do not belong to the representatives of symbiotic microflora, is usually typical for the beginning of infectious diseases.

Inflammation in the lung occurs in a different scenario. It is well known that pneumonia is not contagious infectious disease and does not require isolation of patients and other measures of infection safety [19]. It is also common knowledge that AP agents are representatives of the so-called non-specific microflora and in different proportions are found among the symbionts. However, the presence of these bacteria in the body each of us does not mean the imminent development of AP. In other words, just the presence of the microbe is not sufficient for the development of inflammation in the lung. The development of AP is made possible by the presence of additional factors, which can not only upset the parity of the two biological systems, but also to give rise to an inflammatory process. All of these obvious conditions are evidence of the fact that the etiology of AP can not be associated only with Microbiology. Triggering mechanisms of the disease appear more complex and multifaceted.

All the above facts are well known, but they do not coincide with modern ideas about the nature of the AP. Medical education in the section of acute pneumonia is based on the concept of the fatal hazards of banal microflora and the exceptional role of antibiotics in the treatment of the disease. Therefore, it follows from all the foregoing, the problem of guaranteed cure of AP and the prevention of its

purulent complications should be carried out through a revision of the understanding of the mechanisms of emergence and subsequent development of the disease. However, from my point of view, there is another dilemma. On the one hand, the new doctrine is OP, not only was established and argued on the basis of the well-known axiom of medical science, but also successfully passed clinical testing. A detailed description of the results of this work can be found in a published book-*Igor Klepikov-*"*Acute pneumonia:a new look at the old problem*", *Lambert Academic Publishing, 2017, ISBN (978-3-330-35250-6).*

On the other hand, the most difficult task in the field of care for patients with AP is to change existing stereotypes. The impact of the prevailing concept of AP on the mindset of a vast number of experts will be impossible to fix in a short time. This paradigm remained dominant for several decades, accompanying health professionals with the training period at the University and then throughout their career. Understandable argument for introducing new educational programs in the section, AR is the modern statistics of outcomes in these patients and complete stagnation in the explanation of failures and negative trends in these results. How much time may require such retraining, it is difficult to predict. One thing is quite clear, the beginning of this work cannot be postponed.

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