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Review Article

Lessons from the Pandemic that Need to be Understood and Learned

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ABSTRACT

The current COVID-19 pandemic has changed the rhythm and habits of our lives, and the uncertainty of forecasts, lack of effective treatment, and daily media reports about the growing number of infected people and deaths are causing alarm and concern in society.

Keywords: COVID-19; Pandemic; Effective treatment; Corona virus

ABOUT THE STUDY

The vast majority of people are not able to professionally analyze and evaluate current information about the pandemic, but, as reality shows, medical professionals, whose opinion should instill a sense of confidence and security in everyone, are themselves among the most vulnerable to stressful situations [1-3].

Professional stories of how, working on the front lines to help the most severely affected coronavirus patients, they felt the futility of their efforts and the inability to stop the approach of an unfavorable outcome, left them with indelible emotional trauma and seriously undermined their faith in the possibilities of their specialty. Familiarity with the content of such publications about the current pandemic is an indirect sign of the formation of depressive and panic moods among specialists, who for others have always been an image of encouraging protection and an example of selfless devotion to the profession.

It has long been noticed that panic only worsens the consequences of any events and prevents detailed analysis and making the most optimal decisions. But now it is necessary to overcome negative emotions and conduct a sincere and unbiased assessment of not only current events, but also their background. This should be done without delay, regardless of wishes and moods, since it is about the results of patient care today, and not in the future. A number of facts concerning the causes of the sudden loss of effective medical care for patients with acute inflammation of the lung tissue have existed for many years, and the beginning of the pandemic only exposed the misconceptions and paradoxes of this branch of medicine, which were previously not noticed by many, and therefore were a big surprise.

First of all, it should be emphasized that the main manifestation of coronavirus infection is lung damage. In this case, we are talking about viral inflammation of the lung tissue, and pathoanatomic studies show that this inflammatory process captures the same parts of the organ as the bacterial forms of the disease [4-6]. That is, the localization of inflammation fully corresponds to the concept of Acute Pneumonia (AP), which has been known to medicine for more than two millennia.

Localization of the inflammatory process in the body is the most important characteristic of the disease, since its significance is based on the fundamental materials of medical science. Among such scientific axioms, we should note the existence of a close relationship and direct relationship between the morphology and function of each tissue and structure of the body. For example, you don't need to explain that inflammation of the middle ear interferes with auditory function, not the digestive process. Or, for example, the five classic signs of inflammation described many centuries ago by Celsus and Galen, which are one of the fundamental materials of medicine and which inevitably accompany any inflammatory process. These signs are the basis for the diagnosis of inflammatory diseases, and a violation of the function of the affected organ is of particular importance, since it determines the severity and clinical manifestation of the disease.

It is enough to take into account the above-mentioned materials of the basics of medical science in order to understand in which direction you need to look for ways to help patients with AP. The inflammatory process leads to a pathological structural transformation of the organ, which is inevitably accompanied by a violation of its function, which the body tries to preserve and restore with the help of its compensatory mechanisms. However,

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when a violation of function becomes obvious, and even more critical, it is necessary to save the body by helping it adapt to a new situation, and not concentrate on suppressing the pathogen, wasting precious time.

These principles of care for patients with AP, especially in its aggressive forms, were not only justified by the fundamental provisions of science and confirmed by additional research, but also passed excellent clinical testing. For a number of reasons, the work was interrupted, but its results, which today are of undoubted importance for solving this problem, are presented in detail in a recently published monograph [7].

Unfortunately, the main care for patients with AP over the past decades has focused on fighting pathogens, and the basis of this care has been antibiotics as the main treatment. At the same time, for some reason, no one paid attention to such a paradox as the recognition of one antibiotic as the leading treatment not only for AP, but also for incomparable inflammatory processes in any parameter other than etiology. It should be noted that for a long period of time, the initial treatment of AP was defined in the literature as "antibiotics alone". This term meant that the treatment of patients with AP was limited to antibacterial therapy. If we now remember that antibiotics can only suppress the microbial factor, but do not directly affect the dynamics of the inflammatory process, it becomes clear that stopping and eliminating the inflammatory transformation of tissues is entirely the responsibility of the body.

During the period of discovery and application of antibiotics, the concept of views on the nature of AP as a disease that completely depends only on the microbial factor of its own etiology was gradually and steadily formed. Other etiological factors of the disease did not attract such attention as the discussion of virulent properties of pathogenic microbes, and the lack of effect from antibiotics was always explained by the special aggressiveness of microflora in such observations and difficulties in their diagnostic verification. Descriptions in the literature of viruses as pathogens of AP were purely declarative, since such cases were rare, and etiotropic treatment did not have clear recommendations and an effect comparable to the action of antibiotics against bacteria.

The formation of the microbial concept of AP has become increasingly dominant in the assessment of this disease over time. The unique mechanisms of development of inflammatory processes in the lungs were left without proper attention. The growth of microflora resistance and the decrease in the effectiveness of antibiotics continued to reduce the possibility of treating these patients on the principle of "antibiotics alone". An increasing number of patients needed additional care and intensive treatment. However, since all treatment failures, the development of complications and terminal conditions were considered only depending on the pathogen, the use of any additional methods was based on the experience of medical care acquired in the treatment of patients with peripheral inflammatory processes.

The hypertrophied understanding of the role of the microbial factor in AP and the concentration of therapeutic efforts on its suppression caused this disease, which throughout its history had no signs of an infectious process, to be classified as infectious in recent years. Data such as the identification of the most virulent strains of AP pathogens in healthy individuals without any clinical consequences, as well as the absence of mandatory sanitary and epidemiological measures in patients with pneumonia also did not affect the stability of the microbial-infectious concept of the disease.

In this regard, another fact is very significant, which highlights the obvious discrepancy between the nature of the AP and its modern interpretations. Despite the idea of the pathogen as the main cause of AP and its clinical manifestations, the diagnosis of the disease is usually not related to its etiology. The attending physician does not wait for the results of bacteriological studies to start the necessary treatment. He wants to see the results of the x-ray examination to get the most accurate information about the nature of the main focus of the disease, right? But, as you know, the results of this examination reflect data on inflammatory tissue transformation, and radiologists cannot see the etiology of the process. In other words, the inflammatory process underlying this disease does not depend on existing preferences and retains its significance as the biological basis of this pathology.

Another serious misconception, from my point of view, is the specifics of monitoring patients with AP and using these results for the necessary correction. The fact that the inflammatory process in the lung necessarily captures a certain part of the vessels of the small circle of blood circulation does not require additional arguments. The fact that the vessels of the small circle make up half of the entire cardiovascular system of the body also does not need proof. In order for both halves of this vital system to work synchronously and pump equal volumes of blood, nature has provided for each of them the reverse proportions of blood pressure and Autonomous regulation for any deviations. At the same time, blood pressure in the vessels of the small circle is normally several times lower than in the periphery.

All this information about the features of blood circulation in mammals, including humans, is included in the program of primary medical education and should be known to specialists of those clinical profiles that are relevant to the care of patients with AP. In this case, we are talking about basic knowledge of standard situations, and not about some rare pathology. In this context, the current approach to methods for assessing and interpreting the causes of circulatory disorders in AP seems strange and illogical. For example, the presence in the body of even very virulent strains detected during the examination of healthy individuals does not have any clinical manifestations, and the first signs of AP appear only with the development of inflammation of the tissue structures of the organ. At the same time, the main focus of the disease affects the pulmonary vessels, but monitoring is carried out on the basis of peripheral indicators, the change of which is secondary in the pathogenesis chain, reflecting the degree of violation of pulmonary blood flow in the reverse proportion.

Inflammation of the lung tissue disrupts blood flow in the vessels of the small circle with increased pressure in them, which, in turn, affects their baroreceptors. This leads to a reflex decrease in peripheral pressure and unloading of the lungs. This

is a protective mechanism that allows you to avoid critical situations to a certain extent. The rate of development of such a blood circulation rearrangement has individual parameters and is determined by the so-called immune response, but in modern interpretations this phenomenon is explained by the special virulence of the microflora and its extreme manifestations are considered septic shock. The fact that the detection of bacteria in the bloodstream of patients with shock in AP is only a few percent and corresponds to the indicators of bacteremia in a milder course of this disease is not taken into account when discussing the causes of this complication [8-10].

Looking ahead and comparing the variety of clinical manifestations of coronavirus inflammation in the lungs observed today, we can note the same endless range of options. The only fundamental difference in this case is that in patients with COVID-19 we are talking about a single pathogen (as opposed to bacterial inflammation) and to consider the observed differences in the clinic from the position of virulence of one strain will look, to put it mildly, very unconvincing. Nevertheless, the dominant ideas about the leading role of the pathogen in AP continue to influence the assessment of the condition of patients during a pandemic, when the development of shock in such patients is seen in its viral origin [11].

Currently, respiratory failure and the development of hypoxemia in patients with coronavirus is considered as the main cause of the severity of the condition based on previous ideas about inflammatory edema and infiltration of the alveolar parts of the lungs with subsequent gas exchange disorders. Therefore, the main auxiliary efforts are now aimed at providing these patients with oxygen and various methods that increase its penetration into the lungs [12-16]. Such palliative care for patients is not objectionable, although it is not a therapeutic method. However, the mechanisms that lead to oxygen deficiency need to be clarified.

First, the conventional explanation of the causes of hypoxemia violation of gas exchange in the inflamed lung, it is impossible to draw parallels between the volume of lesion and severity of respiratory disorders. For example, this explanation does not clarify such a dilemma as a more severe degree of hypoxemia with relatively small foci of AP compared to atelectasis of the lobe or even the entire lung. In this regard, it is necessary to note only one significant detail. In conditions of atelectasis, there are no inflammatory changes in the vessels of the lungs. At the same time, in AP, this transformation is a source of reflex action on the pulmonary blood flow, which has its own objective evidence [7].

Second, if we trace the entire chain of mechanisms responsible for delivering oxygen to tissues (as the main goal of respiratory function in General), we can note that an important role in this process belongs to the cardiovascular system, and a violation of the proportion between perfusion and ventilation of lung tissue in the development of an inflammatory focus is considered as one of the leading causes of rapid breathing [7]. This explains the need for the body to use the massaging effect of ventilation on obstructed pulmonary blood flow.

Thus, it can be noted that modern interpretations of the causes of the severe condition of patients with AP do not take into account the most important links in the pathogenesis of the disease, while medical care for patients is based on existing concepts. For example, intensive treatment is based on the correction of peripheral blood flow without taking into account the mechanisms that occur in the lungs and trigger this process. From this point of view, the frequency of deaths from bacterial forms of AP in the group of patients requiring intensive care is quite natural, which in recent years has reached 36%-50% [17-19].

A brief overview of the situation with the care of patients with AP is necessary in order to present the ideology of this branch of medicine, which took on the main burden with the beginning of the pandemic. The appearance of coronavirus patients immediately changed the living and working conditions. If earlier AP was considered an infectious disease, but did not require strict compliance with anti-epidemic measures, now the rapid spread of viral infection has forced the strict implementation of the maximum possible protective measures, including the organization of isolated departments for the treatment of such patients.

The commonality of coronavirus pneumonia with previously known forms of AP even led to the emergence of new term "COVID-19 pneumonia", but did not change the General concept of the disease [20]. Moreover, the appearance of patients with coronavirus pneumonia is currently considered by some researchers as the appearance of a "new disease" [21]. However, clinical, radiological and pathoanatomic data show that COVID-19 pneumonia has only some nuances, but its novelty and fundamental difference from bacterial forms lies only in the new pathogen. The morphology of the process in the lung is characterized by a special severity of coronavirus vascular damage, indirectly indicating the likelihood of developing more severe clinical situations, and the identity of localization with bacterial forms of AP is accompanied by coinciding functional disorders [5].

It is very interesting to look at the role and place of statistics in the current pandemic. Today, there is no need to make much effort to obtain detailed information about the dynamics of this phenomenon, since this data is updated daily and replicated by the media, unwittingly falling into the field of view of almost every reader. Not only specialists in the duty of their profession, but also the population as a whole are actually kept up to date with current events on a daily basis. However, if we compare the information situation in this section of medicine in previous years, it was significantly different from the current one. For example, just over 10 years ago, when bacterial forms of inflammation were still unquestionably predominant, there were about 450 million cases of AR and 4 million deaths a year from this disease [22,23].

Try to conduct a small survey among your medical friends, and you will see that many of them are not familiar with such statistics. But at this point, we all know that over the past year, about 50 million infected people were registered during the pandemic, and about 1.3 million of them died. These numbers are impressive and cause many people a sense of anxiety, since

each unit is the fate of a particular person. But there is another side to this statistic.

First, the overall figure reflects the number of people infected with the coronavirus, not the number of people who are sick, as in the AP. However, this figure depends on the breadth of the population being tested for coronavirus, while the true number of carriers may be significantly higher.

Second, the number of cases in which infection leads to clinical signs of the disease is significantly less than the spread of the virus itself. For example, the most optimal conditions for determining the proportion of cases among infected people are given in observations of large isolated groups of people [24-26]. In these studies, we are talking about cruise ships that were quarantined due to the detection of coronavirus in passengers, which allowed us to track the spread of infection in this closed cluster of people and exclude the possibility of additional infection from outside. Final results showed that up to 80% of those infected remain asymptomatic. In other words, more than half of people tolerate contact with the coronavirus without any signs of the disease, and the only proof of infection is a positive test.

Third, the clinical manifestation of coronavirus disease is characterized by an infinite range of options from barely noticeable symptoms to the development of critical conditions, and in this case, these differences can no longer be habitually explained by the presence of strains of different aggressiveness. After all, we are talking about the spread of a single pathogen, especially when isolated groups of people are observed.

Fourth, most patients carry this infection not only without hospitalization, but also without the use of special and effective treatment methods that have not yet been found. This part of the statistics shows that the body of such patients quite successfully copes with this problem on its own, and medicine remains only in the role of an observer.

Fifth, the most severe and responsible group of patients with COVID-19 are patients who need to be hospitalized for additional care. The negative dynamics of the disease and the increase in symptoms indicate that the body cannot cope on its own and it needs specialized help that can facilitate its compensatory shifts and adaptation. However, at present, the basis of inpatient care for such patients is oxygen insufflation as a replacement and maintenance measure, and in the absence of an effect, further transfer of the patient to artificial lung ventilation [21,27]. At the same time, some researchers quite seriously consider sufficient fan production as a strategic direction in solving this problem [21,28].

Signs of respiratory failure and other disorders in the body of patients are quite rightly considered as harbingers of terminal situations. However, when trying to make strategic proposals, specialists follow the path of predicting critical conditions, rather than preventing them by using treatment methods in accordance with the pathogenesis of the disease [21,27]. Analysis of this strategic approach to solving the problem shows that in reality the strategy remains the same, and the results of treatment based on it only indicate that there are no radical changes in the existing ideology of the disease. For example, the mortality rate among patients with coronavirus pneumonia admitted to intensive care units remains unchanged for pneumonia, reaching 40%-50% [12].

In previous years, when bacterial forms of AP prevailed, there was no reliable clarity with the etiology of the disease. This was due to the great complexity of determining the pathogen directly in the focus of inflammation and the presence of a large list of possible microbial representatives. This situation created the possibility for various assumptions and interpretations. Long-term attempts to solve this problem, which was considered important for the targeted use of antibiotics, ultimately had no effect on the results, and empirical use similar to the first experience of this type of treatment was widely recommended [29]. However, the perception of etiotropic care as a "cornerstone" in the treatment of AP has not changed, since the concept of views on the nature of the disease has remained unchanged [30].

The change in the etiology of pulmonary inflammation during the pandemic shows how deeply and firmly ingrained previous concepts in this field of medicine are. It is well known that antibiotics do not have an antiviral effect and their use in viral lesions does not make sense. However, current observations show that up to 70%-80% of patients with coronavirus pneumonia receive antibiotics, although only a few have indications for such treatment in the form of detected co-infection [31-33].

Unjustified use of antibiotics is not new to medicine. The history of this type of treatment includes a number of similar applications, starting with "preventive" courses, but in this case we are talking about the fact that these materials are additional evidence of a well-founded fear of the causative agent of AP. The narrow view of the nature of AP that has been formed over many years makes it difficult to identify and assess important statistical trends in the COVID-19 pandemic today. Objective statistics inexorably show that the vast majority of the world's population infected with coronavirus successfully and safely tolerates this contact without any help and support from medicine. Among them, there are also patients with clinical signs of the disease who did not need hospitalization and auxiliary equipment.

If you look at the number of hospitalizations in different countries and compare them with the total number of infected people, you can see that most of the infected population is self-isolating and self-healing. It would seem that why then does the spread of this infection keep everyone in such suspense? From my point of view, the explanation lies on the surface. The only population group with a confirmed coronavirus infection where medicine is trying to help is patients who need to be hospitalized. It is in this situation that modern medicine begins to feel its weaknesses and becomes convinced of the inability to stop the aggressive development of the process and prevent the deterioration of patients. These circumstances create an aura of fear and uncertainty, because no one knows in advance how the disease will develop if a particular person becomes infected.

The principles currently used to treat patients with coronavirus are still primarily aimed at suppressing the pathogen. However,

an infinite number of publications on the results of using such drugs that have proven themselves against other viral diseases have not yet had much success with COVID-19 [20,34,35]. The entire modern system of care for these patients ignores the pathogenesis of the disease with its root cause in the lungs. Generally accepted schemes of such treatment orient doctors to correct secondary links of pathogenesis, continuing to consider lung damage as nothing more than an entrance gate and a focus of infection. In recent years, these schemes for severe forms of AP have been brought to automatism. For example, patients with this condition usually started receiving intravenous infusions during hospitalization. Currently, this standard continues to be recommended as a necessary and important procedure in patients with COVID-19 [27].

In connection with the above facts, you should keep in mind the patterns of development of any disease. The occurrence of pathological disorders in the body forces the latter to use its own compensatory mechanisms. If attempts to compensate for deviations do not reach the goal, then, continuing to develop further, the adaptive response can cross the acceptable line, becoming the leading cause of the severity of the patient's condition. A similar mechanism is observed in patients with aggressive inflammation in the lungs, in which the body tries to relieve the vessels of the small circle of blood circulation and prevent further edema and infiltration of organ tissues. If this goal is not achieved, then a picture of circulatory disorders develops that corresponds to the clinic of pulmonal shock [7].

The opinion that shock in patients with AP is septic does not have convincing objective evidence. For example, bacteremia in such cases is detected only in a few percent and does not differ significantly from this indicator in a milder course of the disease [36]. It is also impossible to note the dependence of fatal outcomes on shock in AP with the presence or absence of pathogens in the blood [37]. The desire to explain the discrepancy between the negative results of blood bacteriology and the septic nature of shock has given rise to the idea that this is due to previous antibacterial therapy but then another question arises: why did such effective treatment not prevent the development of this septic complication and what is the basis of this opinion?

The above facts and materials are just the tip of the iceberg that lies in the path of the "Titanic" of medicine. Nature itself identifies a group of patients that it cannot help and who really need specific medical care. By its own example, nature demonstrates the importance of timely and complete compensation of pathological changes, showing the possibility of self-healing of already ill patients. To do this, it is necessary to understand that the cause generates the effect and gives it leadership and influence in the dynamics of the disease. This means that if the patient has developed a focus of inflammation in the lung, and its vital functions begin to show signs of decompensation, this fact is due to inflammatory tissue transformation, and not the presence of coronavirus. And first aid should be aimed at eliminating the mechanisms of these violations, and not at the prosecution of the pathogen.

It is time to honestly and frankly admit that the long-term use of antibiotics as the main treatment for AP has created a narrow system of views that dominates today and is based on the primacy of the pathogen. The accumulated diverse information about the discrepancy and contradictions between theoretical concepts and actual data, between the difference between this pathology and inflammatory processes of other localization, has long indicated the need for a radical revision of the concept of AP and bringing it into line with the fundamental materials of medical science and well-known biological rules and laws that determine the development of pathological situation, regardless of our ideas and misconceptions.

In former times, medicine did not have the technical capabilities that it has today and that allow it to get an objective assessment of the use of various means of helping patients. Based mainly on their own experience of "trial and error", previous medicine has discovered and applied treatment methods that can reduce the return of blood to the pulmonary vessels in emergency cases and help many patients avoid critical situations with AP. Some methods of such care, such as cupping therapy and General short-term cooling of the body of a patient with AP, have received objective confirmation of their effectiveness, but their modern application can be found in areas such as fitness and various health systems, but not in emergency medicine, where they are most needed [7].

The COVID-19 pandemic has exposed long-standing problems in the care of patients with pneumonia, and now that the situation has cleared up and can no longer be accompanied by slow search for solutions and protracted discussions, new patients with this disease is waiting to break this impasse and fill the vacuum of specific medical care.

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