

As Evidenced by the Statistics of the Pandemic

I. Klepikov^{1,*}

¹Professor Renton, Washington, USA

Introduction

Daily news reports on the growth of the total number of people infected with coronavirus and the number of groups of people who have become ill, recovered and died resemble reports from battlefields, and the rapid and steady growth of these indicators, which are widely available to various segments of the population, affects the psychological atmosphere in society. The pros and cons of such broad public information are a separate topic for discussion, but some very peculiar features of this approach can already be noted.

During the current COVID-19 pandemic, the number of infected people in the world exceeded 56 million, and the number of deaths from this infection was more than 1.3 million cases. Such figures can undoubtedly cause alarm and concern for everyone, since these indicators are the fate of people, and the current situation suggests that in the case of a particular person's illness, the outcome cannot be predicted.

For a complete picture of current events, it is interesting to look at similar statistics just over 10 years ago, when bacterial forms of acute pneumonia (AP) clearly prevailed, and viral diseases were rare. The total

number of cases of AP (not infected, as it is now) in the world has reached 450 million cases and 4 million deaths annually [1,2]. The figures presented, which are many times higher than the current ones, have not been replicated and are not even familiar to all specialists. It is not difficult to understand that, despite such a dramatic difference in indicators, modern statistics, due to their wide distribution, undoubtedly have a greater psychological impact on public opinion.

However, in this context, it is not so much the informative role of statistics as the additional characteristics of the pandemic hidden in statistical figures. Analysis of the statistics of the current COVID-19 pandemic allows us to expand the understanding of this infectious invasion in a completely unexpected perspective, which goes beyond the generally accepted opinion about the nature of this phenomenon. According to statistics, most people infected with coronavirus tolerate this contact without any consequences. In this regard, it should be emphasized that a specific treatment for this infection has not yet been found, and many experts note this fact [3-7]. This means that the body of such people copes with this infection without medical help. This number also includes observations where there were

Corresponding author: Igor Klepikov, Professor, Renton, Washington, USA, Email: igor.klepikov@yahoo.com

Received: Nov 23, 2020

Accepted: Nov 23, 2020

Published: Dec 02, 2020

Editor: Jose Luis Turabian, University of Madrid, Toledo, Spain.

clinical symptoms, but the course of the disease did not require hospitalization.

So, according to statistics, most infected people do without the help of medicine at all, resorting to its services only for diagnostic procedures. The total established number of coronavirus carriers is approximate and depends on the breadth of diagnostic tests, while the actual number of infected is unknown and may be significantly higher. This widespread resistance of most of the world's population to a relatively new pathogen is observed even without pre-vaccination, the mass start of which is only expected.

The large number of cases of asymptomatic infection or mild coronavirus infection does not correspond to the atmosphere of anxiety and uncertainty that has been observed throughout the pandemic. Nevertheless, the causes of such psychological stress are quite real, but they begin to manifest themselves only in a group of patients who, due to the increasing severity of the disease, are sent to the hospital. These patients are different from the population of just infected people, and monitoring in quarantine is not enough for them. This category of patients usually shows a negative dynamics of the disease development, which makes it clear that the body of such patients can not cope with infectious aggression on its own and they urgently need specialized care.

In this situation, when modern medicine is obliged to provide fast and effective care, many people began to state the obvious fact that there is no specialized treatment for this category of patients. Medicine really felt its inability to stop the development of the process, resorting only to auxiliary and symptomatic means and remaining in the role of an observer, and not the main actor. Medical personnel who were at the forefront of this care were subjected to extremely severe psychological tests with the development of depressive states and loss of faith in their own specialty [8-10]. Such revelations of specialists on the pages of specialized magazines became a new milestone in the characterization of this problem, since in previous years such publications did not appear.

The very fact of frank confessions of specialists

about their own moral experiences and deep emotional trauma speaks volumes, but the reasons for this situation are presented as a sudden misfortune and fatal inevitability. However, the author of these lines, based on his own experience and a similar situation experienced several decades ago, is deeply convinced and confident that the reason for the current circumstances is the guiding principles of modern care for this category of patients, which were formed over the past decades and only a sharp change in the etiology of the process revealed their narrow focus and inconsistency.

The situation in which the author of these lines found himself 40 years ago is very similar to the care of COVID-19 patients in special departments today. The constant concentration in one Department of up to 10-15 of the most severe patients with initial forms of AP and the lack of the expected effect of traditional approaches to treatment with a high complication rate and significant mortality gave rise to a feeling of powerlessness and hopelessness. At that time, a way out of a difficult situation was found only through a radical revision of ideas about the nature and essence of the disease [11]. Currently, there are new nuances and circumstances, but the essence of the problem remains the same, as well as its solution, because we are talking about the same nosology.

First, you should pay special attention to the fact that the main form of coronavirus infection is inflammation of the lung tissue. Both clinical and laboratory data [7,12] and pathoanatomical studies [13-15] indicate an undoubted inflammatory nature of the process, which engulfs the same organ structures as bacterial forms. In other words, the available objective materials about the nature of this disease allow us to note only certain nuances, but in General, this pathology fully corresponds to the picture of AP, representing its viral variant.

Secondly, being an acute inflammation, coronavirus pneumonia is inevitably accompanied by five classic signs of such processes, among which a violation of organ function is of particular importance. Such functional disorders depend on the inflammatory lesion of certain structures, regardless of the etiology of this process. And since in bacterial and viral pneumonia, inflammation engulfs identical parts of the organ, it

makes no sense to look for differences in the pathogenesis of these forms of damage. The mechanism of development of the disease will be the same.

Third, the clinic of AP and the severity of the condition of these patients is determined by the development of the inflammatory process, and not by the presence of the pathogen in the body. Today, a positive coronavirus test doesn't mean that the owner of this test is sick, does it? However, the appearance of clinical symptoms and x-ray data in the lungs already reflect the next stage in the development of infection, which is characterized by inflammatory transformation of tissue structures. At this stage, the clinical picture and condition of the patient are determined by the presence of a focus of inflammation and its effect on the body's processes, and the pathogen fades into the background and its elimination can no longer bring rapid relief to the patient. Inflammatory changes in the lung tissue are a cardinal diagnostic criterion for AP.

Fourth, the localization of AP is the main distinguishing feature of this disease from all other inflammatory processes, and this uniqueness is based on the following known facts.

1. The vessels of the small circle of blood circulation represent half of the entire circulatory system of the body.
2. Synchronous operation of both halves of the cardiovascular system is provided:
3. the equality of blood volumes entering each circulatory circle;
4. the inverse relationship of blood pressure, which is several times lower in the pulmonary vessels than in the periphery;
5. autonomous regulation of blood pressure, where one of the main roles is played by baroreceptors of pulmonary vessels.

The vascular reaction, which is the classic basis of the inflammatory process, in the case of AP development creates causes that violate the usual balance and harmony between the circulatory circles. Inflammation of the lung tissue, damaging the vessels of the small circle and increasing the pressure in them, inevitably affects the peripheral blood circulation in

order to maintain balance, and the degree of these shifts depends on the rate of development of the inflammatory response and the adaptive capabilities of the body.

Fifth, respiratory failure, which is recognized as the main cause of severe course and adverse outcomes of coronavirus pneumonia [4-6, 12], can be caused by a violation of any of the links of gas exchange in the body from ventilation to tissue microcirculation, and not only as a result of inflammatory edema of the alveolar parts with an obstacle to gas diffusion. The last common explanation raises a reasonable question: why, then, small foci of acute inflammation of the lung tissue can be accompanied by more pronounced hypoxemia than extensive atelectasis with ventilation isolation of the lobe or even the entire lung? The reason for these discrepancies is the abundant blood supply to the lung tissue and the high reflexogenic sensitivity of the vessels in this zone, which allows us to speak of AP as, first of all, a circulatory, and then a respiratory catastrophe [11]. A similar mechanism with the appearance of a focus of irritation in the vessels and a more lightning-fast clinical picture is observed in pulmonary embolism [16-18]. It should only be noted that many researchers note a high tendency to develop thrombosis in patients with COVID-19 [14,19], which may be one of the reasons for the more severe course of this variant of AP.

There is no doubt that the above information is familiar to medical professionals, but you will not find a proper understanding and application of these materials in solving the problem. All attention, research and efforts are now focused on neutralizing and suppressing the coronavirus, while current care for severe patients is limited to symptomatic and auxiliary methods that cannot be attributed to treatment. For example, the most common area of care for patients hospitalized with COVID-19 pneumonia is oxygen insufflation with various options for its delivery in order to enhance the effect of oxygenation [5,20-23]. The palliative nature of such care does not reduce the number of patients who need additional ventilation, so it is suggested to provide a sufficient amount of this equipment [6,24].

The results of medical care among hospitalized patients are very clearly demonstrated by statistical indicators. Thus, the mortality rate among hospitalized

patients reaches 20%, while 25% are transferred to intensive care units on average a couple of days after hospitalization, where a third of patients die [25]. According to other observations, mortality in intensive care units reaches 40-50% [5].

In connection with the latest indicators, it should be emphasized that there is no reason to consider, as is now customary, coronavirus infection as the cause of a sharp deterioration in results. A few years ago, the mortality rate from bacterial forms of AP among patients admitted to intensive care units was the same 36-50% [26-28]. There is no digital difference when comparing these indicators with the above, there is only a psychological difference: as long as the antibiotics were applied, it seemed that the treatment was carried out at the highest possible level. But now the virus has appeared, and the usual prescription of antibiotics has become illogical, and there is no worthy replacement for etiotropic treatment yet. This little-studied fact is, in my opinion, one of the reasons for the psychological burden on medical staff.

The reason for the lack of attention to the above factors in the development and course of AP is the long-term didactic effect of antibiotics, the perception of which, despite a significant loss of their initial effectiveness, in recent years has almost been brought to the concept of a panacea. Many recent generations of doctors were brought up against the background of the growing importance of the pathogen as the main horror of inflammatory processes. Changing the pathogen with the onset of the pandemic did not affect the treatment strategy. Now the main cause of all the troubles is considered to be coronavirus, although statistics show that most infected people safely tolerate such contact without special treatment. The narrow focus of modern ideas about the nature of acute inflammation of the lung tissue is reflected in the fact that, despite the senselessness of using antibiotics against viral infection and the lack of indications, this type of treatment is currently received by 70-80% of patients with coronavirus [29-31].

The ideology of treating patients with AP a few years ago and now during the pandemic has remained unchanged. Distortions in the assessment of the essence of the disease also remain the same. Determining the pathogen of the process in the lung as

the cause of all changes and disorders in the course of the disease, the diagnosis of AP was carried out earlier and continues to be carried out at the present time on the basis of inflammatory tissue transformation, and not a test for the pathogen. The pathogen remains one of the factors that trigger an inflammatory reaction, which later develops according to its biological laws and is accompanied by all the classic signs. Where is this classic of inflammation that underlies AP, used to interpret the picture of the disease? What conclusions have already been drawn and implemented from these materials for the treatment of such patients?

The use of additional methods to help with AP, especially those associated with increased venous return to the lungs, should take into account the uniqueness of the pulmonary blood flow, its regulation and adaptation features. For example, what is the basis for the recommendation on the importance of intravenous fluid replenishment in patients with coronavirus pneumonia [4] and how is the volume of such a deficit determined? At the same time, it is known that the root cause of involvement of the vascular system in the pathological process is in the small circle of blood circulation, and the assessment of violations and their correction is carried out on the basis of indicators of a large circle that have the opposite value. Even this small fragment of AP features shows how many contradictions and inconsistencies exist between the concept of disease, the materials of basic science and medical recommendations.

The world around us and its subjects will continue to function according to their own laws, regardless of our views and preferences. Therefore, the task of modern medicine is to understand biological patterns, using them to help patients. Cellular and biochemical research is certainly necessary to expand the scientific understanding of the mechanisms of the disease and identify possible additional ways to prevent and treat it. However, we must not replace the necessary medical care that millions of patients need today with possible prospects for the future. It is necessary to evaluate the patient as a whole, and not to fix attention on individual laboratory and functional abnormalities, dealing with their narrow correction. Finally, it should be remembered that there is such a thing as "norm in pathology", which reflects compensa-

tory shifts in the body that do not require any correction at a certain stage of the development of the disease. We are talking about those deviations in the assessment of the state of the body, due to which it retains its viability.

Old medicine, not being able to objectively evaluate its treatment methods and not having a modern palette of medicines, was able to empirically find ways to help patients with AP. The simplest and most easily accessible methods of helping the body adapt its functions in AP are cupping therapy and short-term cooling of the body, which are currently used in various health complexes, but not in emergency medical care. Objective confirmation of the undoubted effect of such methods has been proven, and their effect has been successfully used in the treatment of AP [11].

The current situation during the pandemic clearly points to another indisputable fact. Not all problems that occur in the body of a patient with AP can be solved with the help of pharmacology due to the usual use of the appropriate drug. For example, when patients cannot provide adequate ventilation on their own, they are transferred to auxiliary hardware ventilation or connected to extracorporeal membrane oxygenation, right? Why, then, when the body tries to unload the vessels of the small circle in order to avoid further pulmonary edema, instead of the expected diversion of circulating blood, additional fluid is poured into its venous bed and vasopressors are used?

The answers to these questions have long existed in the bowels of medical science and do not need to be invented. It is only necessary to review the distorted ideas about the biological basis of AP and bring the complex of necessary medical care for such patients in accordance with the essence of the disease. Moreover, the current statistics of the pandemic clearly indicate the urgent need for pathogenetic approaches to the treatment of patients with coronavirus pneumonia whose condition requires hospitalization. This group of patients cannot be considered a priori as a contingent with fatal inevitability, and the results of its treatment will depend entirely on the completeness and timeliness of the necessary adjustments in the provision of medical services.

References

1. Rudan I, Boschi-Pinto C, Biloglav Z, Mulholland K, Campbell H. Epidemiology and etiology of childhood pneumonia. *Bull World Health Organ.* 2008; 86: 408–416. [PMC free article] [PubMed] [Google Scholar]
2. WHO Revised global burden of disease 2002 estimates. 2004. http://www.who.int/healthinfo/global_burden_disease/estimates_regional_2002_revised/en/ [accessed Nov 5, 2010).
3. Mayank Vats., et al. "Second Wave of COVID-19 - Could it be More Lethal!!! - Novel 6 T's Strategies May Help". *EC Pulmonology and Respiratory Medicine* 9.8 (2020): 17-21.
4. D. A. Berlin, R. M. Gulick, F. J. Martinez (2020). Severe Covid-19. *NEJM*, May 15, 2020, DOI: 10.1056/NEJMc2009575
5. Renato Seligman and Beatriz Graeff Santos Seligman. "Pandemic in the 21st Century. The Challenge of COVID-19". *EC Pulmonology and Respiratory Medicine* 9.8 (2020): 30-31.
6. V. E. Schaye, J. A. Reich, B. P. Bosworth et al. (2020). Collaborating Across Private, Public, Community, and Federal Hospital Systems: Lessons Learned from the Covid-19 Pandemic Response in NYC. *NEJM Catalyst Innovations in Care Delivery* 2020; 06, Vol. 1 No. 6, November — December 2020. DOI:<https://doi.org/10.1056/CAT.20.0343>
7. Lipman M, Chambers RC, Singer M, et al. (2020). SARS-CoV-2 pandemic: clinical picture of COVID-19 and implications for research. *Thorax* 2020;75: 614-616.
8. Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open* 2020;3(3):e203976-e203976.
9. R. E. Leiter (2020). Reentry. *NEJM*, October 14, 2020. DOI: 10.1056/NEJMp2027447
10. J. N. Rosenquist (2020). The Stress of Bayesian Medicine — Uncomfortable Uncertainty in the Face of Covid-19. *NEJM*, October 7, 2020. DOI: 10.1056/NEJMp2018857

11. Igor Klepikov (2020). "Acute pneumonia. New doctrine and first treatment results." LAP-Lambert Academic Publishing. 2020. ISBN-10:6202679174; ISBN-13: 9786202679176
12. J. H. Stone, M. J. Frigault, N. J. Serling-Boyd et al. (2020). Efficacy of Tocilizumab in Patients Hospitalized with Covid-19. *NEJM*, October 21, 2020, DOI: 10.1056/NEJMoa2028836
13. Zhe Xu, Lei Shi, Yijin Wang et al. (2020). Pathological findings of COVID-19 associated with acute respiratory distress syndrome. *The Lancet Respiratory Medicine*, 2020, Vol 8, Issue 4, P420-422, APRIL 01, 2020
14. M. Ackermann, S. E. Verleden, M. Kuehnel et al. (2020). Pulmonary Vascular Endothelialitis, Thrombosis, and Angiogenesis in Covid-19. May 21, 2020. DOI: 10.1056/NEJMoa2015432
15. Martines RB, Ritter JM, Matkovic E et al; COVID-19 Pathology Working Group (2020). Pathology and Pathogenesis of SARS-CoV-2 Associated with Fatal Coronavirus Disease, United States. *Emerg Infect Dis*. 2020 Sep;26(9):2005-2015. doi: 10.3201/eid2609.202095. Epub 2020 May 21. PMID: 32437316; PMCID: PMC7454055.
16. Elliott C G. Pulmonary physiology during pulmonary embolism *Chest* 1992;101(4, Suppl):163S–171S. [PubMed] [Google Scholar]
17. Lualdi JC, Goldhaber SZ (1995). "Right ventricular dysfunction after acute pulmonary embolism: pathophysiologic factors, detection, and therapeutic implications". *Am Heart J*. 130 (6): 1276–82. PMID 7484782.
18. Turetz M, Sideris AT, Friedman OA, Tripathi N, Horowitz JM. Epidemiology, Pathophysiology, and Natural History of Pulmonary Embolism. *Semin Intervent Radiol*. 2018;35(2):92–98. doi:10.1055/s-0038-1642036
19. J. Nahum, T. Morichau-Beauchant, F. Daviaud et al. (2020). Venous Thrombosis Among Critically Ill Patients With Coronavirus Disease 2019 (COVID-19). *JAMA Netw Open*. 2020;3(5):e2010478. doi:10.1001/jamanetworkopen.2020.10478
20. Koeckerling D, Barker J, Mudalige NL, et al.(2020). Awake prone positioning in COVID-19. *Thorax* Published Online First: 16 June 2020. doi: 10.1136/thoraxjnl-2020-215133
21. Thompson AE et al. (2020) Prone positioning in awake, nonintubated patients with COVID-19 hypoxemic respiratory failure. *JAMA Intern Med* 2020 Jun 17; [e-pub]. (<https://doi.org/10.1001/jamainternmed.2020.3030>)
22. Winearls S, Swingwood EL, Hardaker CL, et al. (2020). Early conscious prone positioning in patients with COVID-19 receiving continuous positive airway pressure: a retrospective analysis. *BMJ, Open Respiratory Research*, 2020;7:e000711. doi: 10.1136/bmjresp-2020-000711
23. Vianello A, Arcaro G, Molena B, et al. (2020). High-flow nasal cannula oxygen therapy to treat patients with hypoxemic acute respiratory failure consequent to SARS-CoV-2 infection. *Thorax*. Published Online First: 23 July 2020. doi: 10.1136/thoraxjnl-2020-214993
24. M. L. Ranney, V. Griffeth, A. K. Jha (2020). Critical Supply Shortages — The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic. *NEJM*, 2020; 382:e41 DOI: 10.1056/NEJMp2006141
25. Boëlle, P.-Y.; Delory, T.; Maynadier, X.; Janssen, C.; Piarroux, R.; Pichenot, M.; Lemaire, X.; Baclet, N.; Weyrich, P.; Melliez, H.; Meybeck, A.; Lanoix, J.-P.; Robineau, O. Trajectories of Hospitalization in COVID-19 Patients: An Observational Study in France. *J. Clin. Med*. 2020, 9, 3148.
26. A. Liapikou, E. Rosales-Mayor, A. Torres. The management of severe community acquired pneumonia in the ICU. June 2014, *Expert Review of Respiratory Medicine* 8(3):293-303. DOI: 10.1586/17476348.2014.896202
27. J. W. Kim, J.J. Kim, H. J. Yang et al. The Prognostic Factors of Pneumonia with Septic Shock in Patients Presenting to the Emergency Department. *Korean Journal of Critical Care Medicine* 2015; 30(4): 258-264
28. A. Vidal, L. Santos. Comorbidities impact on the prognosis of severe acute community-acquired pneumonia. *Porto Biomedical Journal*, Vol. 2. Num. 6. November - December 2017, pages 247-346
29. Rawson TM, Moore LSP, Zhu N, et al. (2020).

Bacterial and fungal co-infection in individuals with coronavirus: A rapid review to support COVID-19 antimicrobial prescribing [published online ahead of print, 2020 May 2]. *Clin Infect Dis.* 2020;ciaa530. doi:10.1093/cid/ciaa530

30. Beović, M. Doušak, J. Ferreira-Coimbra et al. (2020). Antibiotic use in patients with COVID-19: a 'snapshot' Infectious Diseases International Research Initiative (ID-IRI) survey. *Journal of Antimicrobial Chemotherapy*, dkaa326, <https://doi.org/10.1093/jac/dkaa326>
31. Kim D , Quinn J , Pinsky B et al. (2020). Rates of co-infection between SARS-CoV-2 and other respiratory pathogens. *JAMA* 2020; 323: 2085–6.