An Experiential Analysis of the SARS Cov-2 Infection Stages and Therapeutics from a COVID-19 Survivor

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ABSTRACT

In late 2019, there was an emergence of a SARS-CoV-2 strain of the coronavirus with the first reports coming from Wuhan China. This strain has since spread and mutated across the world causing a pandemic as of June 2021. The SARS-CoV-2 causes a disease called COVID-19 in the human body. The progression of the disease symptoms has not been systematically illustrated fully. This paper attempts to logically give a scientific guide on the progressive development of the symptoms experienced by most COVID-19 patients. The study is based on a personal infection of SARS CoV-2, symptom evaluation, medication, and recovery from COVID-19. It also looks comparatively at other literature and patients' experiences. The patient data was collected during the second SARS-CoV-2 wave in Kenya with reports of the South Africa SARS CoV-2 strain being reported in the country. The study recommends a continuous pathogenies evaluation of the subsequent SAR CoV-2 variants infection pathways. This shall decipher the main attack models of the new variants and thereafter in the development and validation of COVID-19 vaccines.

Key Words: *Mutation, Corona, Kenya, Vaccines, Immunity, Pandemic*

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INTRODUCTION

In early January 2020, there were increasing reports of an upper respiratory tract infection disease originating mainly from China. This disease was caused by a novel coronavirus named Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) and was named Corona Virus Disease 2019 or COVID-19 [1-3]. Since then, the epidemic has turned to be an almost unpredictable pandemic. Older people with comorbidities have been shown to be at the greatest risk [4]. Observations on symptomatic individuals show that fever and cough are the most commonly reported symptoms. However, sore throat, shortness of breath, fatigue, anosmia, dysgeusia, and gastrointestinal involvement are also frequently observed [5]. Extrapulmonary manifestations like thrombotic complications, due to COVID-19 are being increasingly recognized [6].

Documented progression symptoms of COVID-19

Most documented reports show that SARS-CoV-2 is transmitted through the inhalation of contaminated breath droplets from an infected person. However, the symptom progression is not systematically documented. Even the progression of the earlier infection of SARS COV-1 within 2-10 days did not have a clearly documented progression. It is only said common symptoms were fever, cough, chills, and fatigue [7]. Others reported shortness of breath and later the development of pneumonia [7], lung failure [8], and death. However, earlier researchers had also pointed that SAR CoV-1 targets epithelial cells in the respiratory tracts causing damage [9]. Similarly, 5-6 days after MERS infection, it was reported that a victim showed fever, cough, and shortness of breath (dyspnea), pneumonia, and kidney failure with the symptoms persisting for almost 14 days. This progression was not tracked and documented by most researchers. Such reports show that the progression route could be influenced by underlying conditions, low immune system, or even age [10]. However, is it not

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amazing that after over 159,626,902 million cases of COVID-19 and over 3,318,400 deaths worldwide [11] it has been reported that the systematic route of infection has not been identified?

Looking through the literature, we find that the COVID-19 has a higher viral load in the nose and throat of patients before other symptoms develop [12]. Studies have also shown the relative number of sites infected in a population by COVID-19 shortness of breath in 44% of patients, lack of oxygen (hypoxia) in the body in about 50% of patients, and around 14% showing a high fever [13-16] also an increase in the fatality rate [17]. Hypoxia and fever are the two main clinical symptoms that appear for critically ill patients with COVID-19. The low levels of oxygen in tissues are caused by poor breathing due to a complication called acute respiratory distress syndrome [18, 19].

One of the common challenges of these researches was that, in some cases, people confirmed with COVID-19 remained asymptomatic, but could still continue spreading the disease to others [20]. Another challenge was that the infection and death rates are not the same between countries, age groups, or even races [21]. People with underlying health conditions like diabetes, cardiovascular disease, and suppressed immune system had a higher fatality rate [20]. Studies showed that the severity and the onset of COVID-19 surprisingly varied in different ages. The lowest risk is observed in children of 19 years and below who had a mortality rate of between 0% and 0.1%. However, older people of 75-84 years had mortality rates of 4.3-10.5%. It is noteworthy that the mortality rate in people over 85 years old was 10.4-27.3% [22].

How I survived the SARS CoV-2 and COVID -19 Syndromes

I shall then give a systematic progression of COVID-19 as I experienced it and back it with scientific explanations. This is designed to assist in therapeutic interventions based on real-time pathogenesis symptom analysis. The chronology of events that led me to be infected started by being very busy and traveling a lot within a short time. I traversed dry places, hilly places, hot places, slept late, and worked hard to meet deadlines especially between 1st March 2021 and 11th March 2021. I started having a sore throat and I thought it was due to my much speaking and changes of weather and thirst. As I was driving on 11th March, I was feeling weak and weary. Therefore, I decided to buy some fever tablets because I felt my immune system was struggling. I bought a complete dose of Fanlar, Feverex, and multivitamins. The next day on 12th March 2021, I started to experience severe sustained headaches, so I changed the Feverex to Panadol. My alimentary canal became inflamed and I could not feel like eating anything. I lost appetite and started to have loose stools. Furthermore, I did not visit the latrine for two days except for short calls. I started to sweat infrequently. Then by 13th March 2021, my sleep became very difficult because when I tried to sleep my lungs felt like collapsing and suffocating and this painfully made me wake up immediately. I started to have short breaths and feelings of not getting enough air. This is when I realized that the same symptoms, which I had helped my wife to overcome the previous week were now showing on me.

Just to explain the case of my wife; she began with a sore throat, then some coughing, then some headaches, and talked of chest pains. I subjected her to garlic, onion, lemon, ginger steam inhaling, and drinking them as immune-boosting concoctions. She went to the hospital and was given drugs. She recovered but I was almost sure that the symptoms pointed to COVID-19. However, I did not want to cause her to panic.

Diagnosed COVID-19 positive

Later, when my sleep became highly disturbed, I decided to go to the hospital. My wife drove me to the Aga Khan hospital. I went through the tests and was found to have a very low number of lymphocytes (0.90 instead of 1-3/l). The malaria antigen test and plasmodial tests were found to be negative. My blood oxygen level was found to be 91/100 ml. This was low but not low enough for me to be put under oxygen support systems. I was prescribed for CT scan to check the condition of my lungs. The radiology report, which was obtained using the serial contrast-enhanced scans was done from the thoracic inlet to the abdomen with reconstructions. They found bilateral peripheral patchy ground-glass opacities with interlobular septal thickening and right upper apical peripheral bullae. The analysis of the results showed there was bilateral atypical pneumonia. Ddx COVID-19 pneumonia with right apical emphysematous changes **(Figure 1)**. In other words, I was declared COVID-19 positive based also on other assays. I was given all the medication of a COVID-19 patient, which included the antibiotic Zithromax (azithromycin 500mg -3 tabs), Zeenik 20 (Zinc 20mg), Vitamin C 250g, amitriptyline 25mg tabs (100s), and Solvin plus-expectorant decongestant.

Figure 1. The serial contrasts enhanced scans with reconstructions showing the bilateral peripheral patchy ground-glass opacities with interlobular septal thickening and right upper apical peripheral bullae. (Source; Machakos imaging center)

Fighting against death

I then isolated myself from my children and went with my wife to my farmland to take care of me. I continued fighting for my lungs because it seems that the virus was working very hard to have them collapsed. I could not sleep from 17th March to 24th March 2021. I kept walking even at night to keep the lungs active. I drank the ginger, garlic, lemon, and onion hot drink throughout. I took watermelon to supplement water losses due to sweating and to boost my immunity and zinc levels. However, three times my energy dropped suddenly due to the fight and I fainted. I was given Lucozade energy drink to be resuscitated back to life. I had frequent spiking of temperatures, which made me feel absolutely uncomfortable. My joints were paining and itching at the same time. I decided to spend vigils in the sitting room so as not to reinfect my wife. My table was with the following flasks: a flask of hot water, a flask of porridge, a flask of the ginger, garlic, lemon, and onion concoction, a flask of cold water. I suspended tea because I had read that caffeine could interfere with zinc and nutrient absorption. The table was full of only alkaline fruits, like mangoes, custard fruit, *Ximenia kaffra*, bananas, and apples because I had read that the SARS virus liked acidic conditions. The chest pain became at one time so much that I applied crushed red onion portions on it. However, this increased the acidity levels and heartburns in the esophagus, hence I stopped using it. I felt I did not need to take the zinc, for I saw the formulation included much zinc sulfate and I thought it could be toxic if not taken as a micronutrient.

On 24th March 2021, I went back for medical review and my blood oxygen level was found to be 94/100. This was within the normal level for human beings. However, my alimentary canal was still messed up with the SARS CoV-2 virus. Food was struggling to settle in it because the peristalsis process was convoluted. The throat was becoming dry very fast and I needed to keep on watering it with hot water. This collapse was one of the most painful experiences during this time. I was smelling death. The feeling became more frequent at night. This made me dread nights. The persistent condition made me consult experts at The Nairobi Hospital COVID-19 laboratory medics who advised me to start steaming the lungs using a common cold water-based inhalant with the brand name, *AXE*. She told me she had also recovered from COVID-19 herself after going through the same signs and symptoms. The inhaling of the medicated steam was a great relief for me for it made me increase the time I could sleep. I steamed three to four times a day. Later, they advised me to take the antihistamine, *Benylin 4flu* to increase the rate of healing and mucus production of the alimentary canal. This was also a great relief and it made me be able to sleep for almost six hours. By 25th March 2021, I could walk with much ease and breathe using my nose alone. I felt I was out of the woods.

The chronology of the symptoms

My medical record background before the COVID-19 was that I had not taken any drugs for more than four years. I was conscious of taking drugs. I preferred to investigate the cause of any malady and then deal with it either by sleeping, boosting the immunity with food, drinking water to keep my urine pale yellow, fasting, exercising, and traveling. However, the COVID attack

was very fast and very severe. Before I could organize my medical armory I was already down.

Nevertheless, I can clearly explain how the disease progressed. I am persuaded this is the general pathway of COVID-19 progression even as I have reviewed peer-refereed journals. I can say that the virus seems to start the attack with a specific target of the lungs avoiding the immune system.

The initial target

It starts by being breathed in through the nose or mouth. It lands on the throat and causes a sore throat. This is the first symptom. The body reacts by triggering coughing. If one is alert and with a strong immune system, then s/he can defeat it at this stage. Those who are unable to conquer it at this stage will have the virus multiplying and entering the bloodstream and then the nervous system and heads towards the brain. This causes one to have headaches. Headaches are signals that the body has been invaded and all radars of the immune system are stimulated. The virus then reaches the hypothalamus and causes temperatures to rise, causing fever. What I realized was that the temperatures are not constantly high, but at an oscillating mode of high and low. That is why using the temperature gun to determine who is COVID-19 positive or not is no easy because when the temperatures are high, most people will not be mobile but will be battling with some sweating and bad feelings. Therefore, the first sign of COVID-19 is sore throat followed by high temperature, sweating, headaches, and fever. In literature, this stage is still referred to as mild.

The virus at the throat keeps on multiplying and spreading and they enter the alimentary canal. This causes a degradation of the epithelium of the walls. This reduces the peristalsis process causing diarrhea and loss of appetite. The loss of much water ensues. If one does not take enough water and food, then emaciation follows in a short duration. The headache still persists and the fever causes much discomfort. Remember, the hypothalamus is still under attack and this causes its functions like regulations of eating or drinking and energy maintenance to be disoriented. At this stage, the disease is called moderate COVID-19.

Furthermore, the virus at the throat keeps on multiplying and spreading and enters the respiratory system through the bronchus, then into the lungs. In the lungs, they pass through the alveoli and they can be breathed out to be spread to other people. They also cause the lining of the alveoli to be inflamed. This causes chest pain and pneumonia. If this progresses it causes an increase in fluid in the breathing pathways, which I found to be much difficult to get out. The fluid also increased the feeling of suffocation. This is the stage when the amount of oxygen entering the lungs becomes greatly reduced. It is at this stage that patients need oxygen support. This stage is called the severe COVID-19.

When I reached this stage, I was helped by the inhaling of the inhalant I called AXE before. This helped to increase breathing. I think it had camphor, eucalyptus oil plus other good things. It might have created an unsuitable environment for the virus. This is because I felt that the alveoli or lung inflammation were reduced. It made my healing faster and my sleep time possible and longer. It increased my appetite. It made me have lower temperatures. If one does not overcome this stage, then s/he shows extrapulmonary manifestations like thrombotic complications, heart dysfunction, and eventual death. This occurs as the virus attacks are destroying multiple body organs at the same time as shown in **Table 1**.

The last sign that I experienced and was very negative was pain and itching of the limbs ends and joints. The ends of the fingers and toes changed color and were quite painful. They made my actions to be painful. It took two weeks before the pain disappeared. I was told that this did not need any medication but just drinking much water and moderate actions.

Table 1. Summary the 16 progressive symptoms of COVID-19 are as follows:

Stage	Symptom	Reason
1.	Sore throat	Due to SARS CoV-2 attack on throat epithelial cells
2.	Dry cough	Reflex action of the body to remove the virus and its effects
3.	Fever- flashes of high temperatures	Due to the immune system response to attacks
4.	Headache	The fever and viral load in the blood
5.	Diarrhea	The destruction of the alimentary canal by the virus
6.	Loss of appetite	Due to nausea and diarrhea
7.	Shortness of breath	The lungs being blocked by the accumulation of viruses at the alveoli
8.	Elevated resting heart rates	Reduced oxygen in the blood
9.	Low blood oxygen levels	Due to inflamed alveoli, which block oxygen exchange
10.	Fainting if the person overworks	Due to less oxygen reaching the brain and body energy little
11.	Loss of sleep hours	Insomnia due to lungs not being able to relax and immune system fighting
12.	Weak immune system-few lymphocytes	The lymphocytes killed by viruses and not eating or sleeping well
13.	Nasal congestion	The immune system reacting due to counter attacks

14.	Fatigue and weakness	Due to not eating, sleeping, and body intrinsic fighting
15.	Aches and pains in joints	Due to the medication, lack of enough water, nerve attacks
16.	Discoloration of finger and nails	Due to medication, inactivity, and waste accumulation.

CONCLUSION

Observations show that most people with a strong immune system can recover from a COVID-19 attack. Indeed, 80% of the symptoms of COVID-19 recover without needing hospitalization [23]. The other, 20% of the people who develop severe COVID-19 symptoms are mainly those with underlying conditions like diabetes, hypertension, lung and heart diseases, cancers, aged people, fatigued people, or those who do not treat the first signs promptly.

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REFERENCES

[1] Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus–infected pneumonia. N Engl J Med. 2020;382(13):1199-207.

[2] Magomedova UG, Khadartseva ZA, Grechko VV, Polivanova MN, Mishvelov AE, Povetkin SN, et al. The Role of Covid-19 in the Acute Respiratory Pathology Formation in Children. Pharmacophore. 2020;11(5):61-5.

[3] Eltayeb LB. An update about Coronaviruses with Emphasis on Newly Emerged COVID 19. J Biochem Technol. 2020;11(3):14-20.

[4] Yang X, Yu Y, Xu J, Shu H, Liu H, Wu Y, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. Lancet Respir Med. 2020;8(5):475-81.

[5] Chen G, Wu DI, Guo W, Cao Y, Huang D, Wang H, et al. Clinical and immunological features of severe and moderate coronavirus disease 2019. J Clin Invest. 2020;130(5):2620-9.

[6] Gupta A, Madhavan MV, Sehgal K, Nair N, Mahajan S, Sehrawat TS, et al. Extrapulmonary manifestations of COVID-19. Nat Med. 2020;26(7):1017-32. doi:10.1038/s41591-020-0968-3.

[7] CDC. SARS Basics factsheet. CDC, Atlanta, GA, 2019.

[8] Breugelmans JG, Zucs P, Porten K, Broll S, Niedrig M, Ammon A, et al. SARS transmission and commercial aircraft. Emerg Infect Dis. 2004;10(8):1502-3.

[9] Peiris JS, Lai ST, Poon LL, Guan Y, Yam LY, Lim W, et al. Coronavirus as a possible cause of severe acute respiratory syndrome. Lancet. 2003;361(9366):1319-25.

[10] Zumla A, Hui DS, Perlman S. Middle East respiratory syndrome. Lancet. 2015;386(9997):995-1007.

[11] Coronavirus update (Live) May 5th 2021: 159,626,902 cases and 3,318,400 deaths from COVID-19 virus pandemic. Available from: https://ns.worldometers.info/coronavirus/?napp=mysection&subtab_h=24.

[12] Zou L, Ruan F, Huang M, Liang L, Huang H, Hong Z, et al. SARS-CoV-2 viral load in upper respiratory specimens of infected patients. N Engl J Med. 2020;382(12):1177-9.

[13] Garg S, Kim L, Whitaker M, O'Halloran A, Cummings C, Holstein R, et al. Hospitalization rates and characteristics of patients hospitalized with laboratory-confirmed coronavirus disease 2019—COVID-NET, 14 States, March 1–30, 2020. Morb Mortal Wkly Rep. 2020;69(15):458-64.

[14] Michelen M, Jones N, Stavropoulou C. In patients of COVID-19, what are the symptoms and clinical features of mild and moderate cases. Centre Evid-Based Med. 2020;16. Available from: https://www.cebm.net/covid-19/in-patients-of-covid-19-whatare-the-symptoms-and-clinical-features-of-mild-andmoderate-case/

[15] Auwaerter PG. Coronavirus COVID-19 (SARS-2-CoV). Johns Hopkins ABX Guide. 2020. Available from: https://www.hopkinsguides.com/hopkins/view/Johns_Hopkins_ABX_Guide/540747/all/Coronavirus_COVID_19__SARS_CoV_2

[16] Verity R, Okell LC, Dorigatti I, Winskill P, Whittaker C, Imai N, et al. Estimates of the severity of coronavirus disease 2019: a model-based analysis. Lancet Infect Dis. 2020;20(6):669-77.

[17] CDC. People who are at higher risk for severe illness. CDC, Atlanta, GA, 2021.

[18] Bhatraju PK, Ghassemieh BJ, Nichols M, Kim R, Jerome KR, Nalla AK, et al. Covid-19 in critically ill patients in the Seattle region—case series. N Engl J Med. 2020;382(21):2012-22.

[19] Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395(10223):497-506.

[20] Hu Z, Song C, Xu C, Jin G, Chen Y, Xu X, et al. Clinical characteristics of 24 asymptomatic infections with COVID-19 screened among close contacts in Nanjing, China. Sci China Life Sci. 2020;63(5):706-11.

[21] Van Dorn A, Cooney RE, Sabin ML. COVID-19 exacerbating inequalities in the US. Lancet (London, England). 2020;395(10232):1243.

[22] Onder G, Rezza G, Brusaferro S. Case-fatality rate and characteristics of patients dying in relation to COVID-19 in Italy. Jama. 2020;323(18):1775-6.

[23] World Health Organization. Media Statement: Knowing the risks for COVID-19. Accessed on July 7th. 2020. Available from: https://www.who.int/indonesia/news/detail/08-03-2020-knowing-the-risk-for-covid-19.