

## Escaping Cytokine Storm for the Poor

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### Abstract

*Since the Covid 19 broke out, people are all looking for the cure. Many people died from this fatal disease; and cytokine storm is one of the most dangerous complications. For some low-income people, they are not eligible to be tested for Covid; and they might not get the proper medical care. In these cases, self-care procedures, such as exercise, clear the airway, handwashing, wearing mask, taking meds on time, and proper diet become crucial in deciding the prognoses. This research is about a case study of a patient who is not eligible for a Covid 19 lab test; and how she dealt with a severe flu-like disease*

### Introduction

The low income and people living in poverty have high Covid infection and mortality rates [1]. In Krieger's research, she and her colleagues investigated 20,000 people who died of all causes during the first 15 weeks in 2020. They found out that the death rate is 40% higher in cities and towns with big number of colored people; and mortality rate is 14% higher among those crowdedly housed than that of others [1]. In the current pandemic, it is these poor people who are taking the biggest hit and have the limited health care access. Therefore, self-care becomes very important. This paper who follow through a recovered case for five months and observe how and her roommate kept themselves healthy.

### Method

This research will be a case study. While there is no guide to follow for Covid nursing, this researcher followed the guide for HIV nursing. According to Watson, the case in case study should be factual, and describing a real person. The author should maintain privacy. Do not disclose certain wards or location to make sure nobody knows who the subject is. Do not date the case unless there is a issue such as public events. All backgrounds and impacts should be described. All patient outcome should be included. The care should be critically appraised and there should be references [2].

This patient is a significant case because she goes to a local food stop to get her meals everyday by foot. Also, she is of low income and was not eligible for Covid testing. Also, at the beginning of February, which is exactly the time when Covid started in the US, she came down with a fever. Because she had a flu shot the past October, it is unlikely that it was a flu. Also, so far, after that flu-like illness, she had a full recovery and did not get sick. Everyone is different. This one case might not mean that what she is doing is good for everyone else. However, if there is a report about every significant case, people will possibly be able to find out the general trending in Covid treatment.

The goal of this paper is to answer following research questions:

- What exactly is her diagnosis and why?
- What is the best practice for clearing the airways with limited resources?
- Besides over the counter NSAIDS, what is the best practice in medicinal usage for Covid?
- What is the best diet and sleep practice for Covid prevention?

### Result and Discussion

This section has four parts. The first part is to report the case including major complain, current history, vital signs, physical examination and diagnosis. The second part will be how she cleans her airways. The third part will be the medicine she has been using and comments about the medications. The fourth part will be some general precautions in preventing Covid.

### Case Report

Feb. 6th, 2020

- Patient major complaint: sore throat, fever, cough for one day.
- Current history: patient felt sore throat since she had a two-mile run in a gym in her residential building two weeks ago. Then she recovered after two days. The day before she saw a doctor, she went for another two-mile run in her residential building gym, the symptoms came back. She took some over the counter NSAIDs for her fever. She mentioned that she felt a flu coming up during her yearly checkup. She has a productive cough with small amount of phlegm. This patient did not have a history of traveling during the past one month; never smoked; and never consumed significant amount of alcohol; but the residential building that she was dwelling in had an diagnosed corona virus case. She had a balanced diet; and she slept 7-9 hours per night.
- This patient had a positive TB test 20 years ago. She was treated with oral Rafampin for six months. She also recovered from breast cancer (DCIS) seven years ago. She went on surgery

treatment afterwards and currently has no breast abnormality on her yearly mammogram. This patient did have her flu shot the past October. The patient denied hypertension, diabetes, or heart diseases. Physical examination showed body temperature of 38.2C; pulmonary auscultation showed breathing sounds coarse. Lab result showed an influenza B infection, with no strep throat.

The treatment for this patient are:

1. Antiviral treatment with oseltamivir.
  2. Drinking hot liquid cooked with radix scutellariae, garlic, ginger, rice, and orange peelings.
  3. Coughing out any phlegm every morning. Apply appropriate physical force to help with the coughing.
  4. NSAIDS when necessary.
  5. Wear mask.
- The patient's fever went away two days after the anti-viral medication. She mostly recovered 3 weeks after she first had symptoms. She coughed out about one to two tablespoons of phlegm every morning. In the beginning, it was thick yellow-greenish phlegm; and the phlegm turned clear and thin at the end about 3 days.
  - The first thing to discuss is the diagnosis. This patient has a history of tuberculosis. It is possible that her lung structure and total body condition make her prone to lung infection [3]. At the time, the beginning of February, covid19 was not known to be prevalent in Boston area yet. It was on February 7th, the Chinese doctor who raised alarm died. The Covid-19 was formally named on February 11th [4]. Also, this patient did not travel to an endemic region for the past month. Therefore, her doctor did not order the test for corona virus. However, the patient might have a contact history for covid 19, because there was a diagnosed case in the building. Also, the two times when she got some serious symptoms were when she was done with her two-mile run in the building gym. Therefore, the diagnosis should be influenza B, and suspected covid 19.

### Clearing the Airway

The second thing to discuss is the coughing. This patient was coughing out 1-2 tablespoons of phlegm for close to three weeks. If she coughs out average 25ml of liquid every day, for 21 days, it will be about 500 ml of phlegm. This patient, as an adult woman, should have about a tidal volume of 400ml, which is the volume of air that is transported into and out of the lungs with each breath [5]. Therefore, the amount of liquid that she coughed out exceeded the amount that she takes in and out during every respiratory cycle. If that much stuff stayed inside her lung, she would have problem breathing after these 3 weeks. A patient can clear her own airways. The basic methods include steam therapy, controlled coughing, draining by changing body position, exercise to increase muscle strength, green tea for anti-oxidant, eating anti-inflammatory food and chest percussion [6]. In this patient's case, she used humidifier in her home; slapped her own back to cough every morning, and cough again after a 30-minute yoga session every day.

### Medicine Usage

The third thing to discuss is the medication usage. In her case, the anti-viral medication is Oseltamivir. Oseltamivir is for treating a cold that happened for less than two days. Also, according to a research done by Singh, Robinson, & Hilderman, the sooner this medicine is initiated, the less likely that an influenza A patient develop secondary

infection [7]. In this patient's case, her fever went away two days later. Currently, this patient is using Radix Scutellaria, garlic, ginger, Mung bean, rice, and orange peelings to cook soup every morning. She has been drinking her rice soup ever since that fever. So far, during the quarantine, she did not get sick.

While Oseltamivir is scientifically proved to be effective, herbs can be controversial [8]. Currently, there are many researches about herbal medicine treating virus infection. A kind of plant namely scutellaria is an anti-viral, anti-tumor, anti-bacterial, antioxidant, anti-inflammatory, hepato-protective, and nero-protective agent [8]. One of the mechanisms of Covid causing severe human illness is the cytokine storm of host immune response [9]. For instance, Ryan Pedgett, A healthy 44-year-old ER doctor in Seattle had a severe immune response, and nobody expected that he would die. If there were no such storm, virus would stay in human body and reproduce massively [10]. With that being said, anti-inflammation medicine might prolong the duration of the disease because it might ease up the storm and overall reduce the organ system damage, but possibly prolong the duration of the disease.

Currently, there is well-known herbal product called "lianhuaqingwen". The content of this herbal supplement is weeping forsythia Capsule, Japanese honeysuckle flower, Ephedra Herb (honey fried), Bitter Apricot seed (Stir-baked), Gypsum, Isatis Root, Male Fern Rhizome, Heartleaf Houttuynia herb, Cablin Patchouli herb, Rhubarb, Bigflower Rhiola Root, Menthol, and Liquorice Root [11]. There are two content in this product that are questionable: Ephedrine and bitter apricot seeds. Ephedrine is a central nervous system stimulant that work similar to epinephrine. It is not anti-viral nor anti-inflammation. The side effects include a series of sympathetic system stimulating signs such as nervousness, headache, nausea, and insomnia [12]. That is not a favorable thing for patients because sleep is important for healthy immune system [13]. As for the bitter apricot seeds, It will metabolize into HCN in human body and HCN is very toxic [14]. Therefore, there is no obvious pharmacological basis to support the effectiveness of "lianhuaqingwen". Actually, an American brand "Phyto-relief CC" have the similar active component with "Lianhuaqingwen", but without the HCN content [15].

Garlic contains Allicin, which can be anti-viral [16]. People consider garlic as therapeutic since ancient times. Modern medicine proved that garlic lowers blood pressure; has anti-tumor activity; decrease blood sugar levels in diabetes mellitus; relieve hepatotoxicity; can be anti-microbial and anti-viral [16]. Although, it is effectiveness on common cold is not conclusive, there are obvious evidence that garlic decreases the occurrence of the disease. When Lissiman et al. randomly assigned 146 subjects to take garlic for 12 weeks, 24 of the garlic group caught a cold, while 65 of the placebo group caught a cold [17]. Garlic usually works best in preventing a cold when taken raw, but most people do not like the smell. The right way to cook garlic is to mince it first; then let it sit for 15 minutes before cooking [18].

Ginger can be effective in treating common cold, while orange peel is another anti-inflammatory agent. In Luzzi et al's experiment, the researchers divided 124 people into two groups [15]. 61 of them were treated with Phytorelief cc, which contains ginger, turmeric, and pomegranate extract; 63 of them were control group. The result showed that the experiment group has 5 people got sick while

the control group got 17 cases. Another research done by Denyer, Jackson, Loakes, Ellis, & Young, they found that the ginger extracts inhibit rhinovirus; and the active ingredient was sesquiterpenes [19]. Also, according to the research done by Gosslau, Chen, Ho, & Li, 250mg/kg of orange peel has the same anti-inflammatory effect as ibuprofen [20].

While garlic, ginger, and orange peel are anti-virus. This patient cooked these herbs in her morning rice soup with poached eggs. Rice, especially rice husk, is a natural diuretic, which helps eliminating toxin by getting rid of extra body water [21]. It will help people urinate and wash away toxins. Compare with white rice, brown or black rice has higher content of protein and vitamins because brown rice contains the outer layer and germ while white rice does not [21]. The poached eggs also help with the protein intake.

### Other Precautions

There are also other factors that affect Covid recovery. Good examples are circadian rhythm, a balanced diet, wearing mask, and handwashing. Sleep is also important for immune function [13]. According to Besedovsky's research, if people who get vaccinated of Hepatitis A get a good night sleep right afterwards, they obtain a strong and persistent increase in the number of antigen-specific T-cell helper cells and antibody titres. The right amount of sleep is 7-9 hours per night [13]. Protein intake is also important because immunoglobins are made of protein. Therefore, right amount of protein of a complete protein profile is important in fighting diseases [22]. Wearing mask has a big significance too. Combined with social distancing, for instance, in Washington, where 80% people wore mask, can reduce mortality by 24-65% [23].

Another prevention method is hand washing. The other day when this author was surfing you tube, one thing surprised her was that so many people including many professionals do not know how to wash hands. The right way to wash hands is as follows: First, you need to lather the hand up after test the water temperature [24, 25]. Do not burn yourself. This lathering up can last couple of seconds to several minutes, depending on how dirty the hands are. Then rinse your hands under clear water for 20 seconds. If you do not know how long 20 seconds is, sing the Alphabet song. Next, do not turn off the faucet yet. Pad dry your hands with a paper towel; then turn off the faucet with the paper towel. The last step is very important, because you do not touch the dirty faucet with your clean hands.

### Conclusion

In this Covid pandemic time, a cytokine storm is one of the worst killers. However, people in the lowest social class are the ones who pay the most. This paper was about how poor people, who are not eligible for Covid testing and do not have access to the best medical care, have to overcome the sickness by themselves at home. The self-help content includes clearing the airway, self-medicating, balanced diet, wearing mask, and handwashing. Also, this researcher tentatively commented on the significance of traditional Chinese medicine. The method of this paper is case study. So far from February to mid-June, the case above and her roommate did not get sick. The two both think that their practice is effective.

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