

Revised Treatment Guideline and Information for Corona 19 Virus Infection for adult patient (6th edition)

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(Disclaimer: This is intended as discussion among medical professionals, if you are a patient, please consult your doctor first before you do anything.)

1. It is **paramount to detect the virus early, and treat early**. This allows us to prevent the patient from getting into severe cases by maneuvers that I will discuss in some sections below.

2. Significant Clinical and pathological features: (credit to: Chinese Official Corona 19 Virus Blueprint, 7th edition)

- a. Decreased CD4 T cell
- b. Bleeding necrosis in lung.
- c. Shrunken spleen.
- d. Epithelial damage to heart.
- e. Tubular damage to kidney.
- f. In the early stage of disease, the image study showed **multiple small patches and interstitial changes**.
- g. Significant clinical features: **chest tightness**, shortness of breath, fever, headache, **sudden worsening**, reduced O₂, **recurrence after initial recovery**. Really severe patient can experience immune storm, Muti-organ failure, ARDS, coma, & death.

3. Based on above, the author suspected direct attack by virus or virus toxin to those organs, and causing bleeding or micro-bleeding. The virus might also have a blood dissolving and tissue dissolving features. Based on all these findings, the author felt the following treatment guideline would achieve good results on mild to moderate patients. The goal is preventing the patient getting into a severe case. **For most patients, you have 3-10 days window period from starting the mild symptoms to worsening. Use this window period very well, don't waste it.** Once your patient getting into severe cases, they could die or have very bad permanent organ damages. Your patient should be at **full rest. They should be prepared for the worst time when the virus load peak. Any attempt to work at this critical window period is not wise.**

A. Reduce viral load by:

-IV fluid, drinking, around the clock, electrolytes supplement if necessary.

-Induce diarrhea with stool bulking agent such as MiraLAX to have stool output 2-3 times per day. Patient should also keep eating nutritious food. This is especially important in the initial phase of the infection since the viral load doubles every few hours, by reducing the initial viral load, you really can reduce the viral load at the peak. Therefore, you will have a much better clinical course. Stool formation process can suction out virus from intestine, more importantly it can suction out toxins with bigger molecular weight which we can not get rid of via urine. Further, corona virus DNA was detected in some patient's feces. This suggest GI track might serve as a reservoir for the virus. So, by keeping eating and defecating, we took out as much toxin and virus as possible. I give this method a name "**GI tract flash**".

B. Protect lung and other organs early by:

-Vit E, 500mg-1000mg per day.

-Vit C, 75mg per day.

- **Early steroid usage.** I recommend start from 20mg per day to start, taper based on patient's condition.

C. Supportive therapy around the clock, full dose, optimize patient's lung reserve.

-very important to relieve fever by **Tylenol around clock.** Fever will make the consequence of virus attack on the lung more severe, more intolerable to the patients. It also increases heart rate and breathing rate. It put more stress on the patient. Therefore, it is critical to relieve fever. It also treats headache, and prevent immune storm.

-O2 if necessary. I don't recommend high flow unless it is really necessary since the lung is already being attacked by virus. High O2 flow tend to worsen the damage.

-also use **Benadryl around the clock.** Reduce sputum production, relieve muscle dystonia (chest tightness) as much as possible.

-Claritin

-Ativan 0.5mg-1mg, once per day, can be used if chest tightness could not be relieved by Benadryl around the clock. Generally speaking, for moderate patients, this is not necessary.

-Robitussin to get the sputum out.

-Mucinex to thin the sputum.

-very important to keep airway open by **albuterol**, hydration, sputum clearance, pulmonary toilet.

-Small amount of NASIDs such as Aleve might be helpful if the patient has significant chest pain or pain, yet, be very careful, watching for any sign of asthma. I would not even use it if the patient has asthma.

-If stomach get upset by all these pills, add Protonix or Prevacid to help.

All above measures help to put the patient at a condition with better lung reserve. Since the disease process is so unpredictable with sudden deterioration, this is critical.

Some measures above will also help preventing the patient from getting into immune storm. Reality is if you implement Tylenol, Benadryl, Claritin, steroid, fluid flash, and bowel movement early enough, your patient will not have an immune storm.

D. Direct Attack or Curbing Virus:

-Chinese herbal medicine: Lian Hua Qing Wen powder, Ban Lan Gen powder, drink as tea. They have been selected thousands of years to treat upper respiratory infection. They are helpful.

-HIV drugs (detail see Chinese Corona guideline 7th edition).

-Interferons. (detail see Chinese Corona guideline 7th edition).

E. Chinese Medicine: **Gua Sha** and other methods.

-I prefer Gua sha based on it gives some immediate relief when the toxins and cytokines causing patient discomfort.

-Most importantly, it induces immune response that we need. When we give vaccines, it is injected into subcutaneous tissue. When we induce micro vessel bleeding, the antigens also go to the subcutaneous tissue. It augments and fastens our body to produce antibody.

F. Malaria Treatment Drugs: chloroquine, per the Chinese guideline, it could work on some patients. The fact this drug might work further support my suspicion that this virus has a blood dissolving feature. The sudden worsening of patient and small patches on lung image studies also support bleeding or micro-bleeding in the lung. Based on this, I felt the blood thinner such as baby aspirin, Plavix, fish oil might need to be reduced in frequency to reduce the bleeding damage in organs. Please don't do this yourself, consult your doctor.

G. **Early broad-spectrum antibiotic coverage:** such as z pack.

The reality is when the lung being directly attacked with debris and wound, secretion, combined with decreased CD4 T cells. Your patient will have co-infection with bacteria. A corona 19 virus pneumonia plus a bacterial pneumonia is deadly. We cannot risk it. Treat.

H. Dialysis, plasmas exchange, recovered patient's plasma infusion: more severe patients.

I. **Virus tends to recur after initial recovery.**

-After initial recovery from the virus, the patient should continue to rest for 14 days. Note, the virus probably causes bleeding. Therefore, strenuous activities and sudden movement should be avoided. Give your body enough time to heal and rehab is very important. Patient should not work or attempt to work. Housework should be minimal. Environment should be clean. An air purifier in the patient room would be helpful. Sun should be allowed into the room at least 3-4 hours per day. I prefer change air at lunch time with warmer air. Patient might feel they are OK and do things they regularly do, that is a mistake. **The patients should really expect possible worsening symptoms at any point during the illness, even when they feel somewhat recovered. The clinical course of this virus is extremely unpredictable.**

-Continue anti-viral Chinese herbal medicine for 7-10 days with gradual tapering. This helps to prevent recurring.

-Continue Vit E 500-1000mg per day for another 30 days.

-Eat nutritious food, and build up strength. The disease process is very exhausting. You might need to eat 4-5 times a day to build up your strength quickly. That is OK. Just don't eat too much in one meal so that your sugar shoot to the sky. If you have diabetes, check your sugar.

I. Cautions:

-**Monitor blood sugar**, put patient on long term insulin plus insulin scale for moderate to severe diabetic patients. I prefer to take the patient off oral diabetic medications unless the patient only requires metformin at lower doses. This prevents some drug to drug interactions since we are using maximal doses on some supportive drugs.

-Monitor electrolytes.

-Monitor hematology, d-dimer.

J. Food during the ill time:

-Recipe one: chicken soup with mixed vegetables, extremely easy to cook. Good nutrition and electrolytes supplement.

-Coconut water: have the same components for electrolytes as human blood. Good source for electrolytes supplement.

-Steamed pear or boiled pear with some honey: very soothing to lung and bronchus.

-Hot Green tea: open bronchus, and anti-oxidant.

-Ensure or Boost therapeutic food supplement.

-Other anti-oxidant: avocado.

4. Severe cases:

A. What constitute severe cases:

-in ICU

-Require ventilator

-in shock, immune storm, coma, any organ failure, and multi-organ failure.

B. We can use most of the supportive measure discussed above, yet with much more caution since the patient's reserve for some major organs are lower. That includes: heart and kidney for handling fluid, liver and kidney for drug metabolism. You might have to reduce dosage of medication, and gives IV fluid with great caution if the heart is failing to avoid pulmonary edema.

C. You need to follow your regular ICU protocols

D. Some More Specific Treatment to try:

-Plasma infusion from recovered patient: this neutralize the virus toxin or virus itself. Make sure keep the fluid and urine going. I would also give Benadryl and Tylenol.

-IVIG

-Plasma exchange outside of body.

-Dialysis

-Malaria drug: this is relatively safe for use less than two weeks. It is worth trying if the patient has obvious blood dissolving sign in: d-dimmer, coagulation profile, microscopic red blood cell examination.

-Vit K if there are significant signs of bleeding.

-HIV drugs: this is worth trying if the patient's CD4 T cells is significantly lower.

-Interferons: this is a somewhat riskier compared to other method considering the patients already have fever and in a weakened condition. It will be different from you are giving it to a patient that is afebrile and has good

reserve. The best thing you can do is to consult a doctor who has extensive experience in using immune modulators.

-Snake venom antibodies: no one have ever tried this, but I think it is worth trying on patient who show clearly signs of blood dissolving, tissue dissolving, and lung bleeding features. The virus tends to pick up host's DNA during the constant DNA exchange process between virus and host. If a virus producing some toxins that dissolve blood and tissue in such a great amount, it is most likely coming from venous snake. The snake's toxin works in two ways: the most popular one is dissolving blood and tissue, the other one is neuron toxin. If the patient is in coma, is it possible that neuro toxin is produced by virus? If you have patients that sick, you are most likely to lose your patient any way. Why not try something that could help? The treating doctors need to find out which antibodies is for neurotoxin and which is for blood dissolving, and try on your patients accordingly. This is very daring treatment, but we are desperate. We don't have anything that really works.

-Please note, when you give medications that directly kills virus, there is great possibility to induce more inflammation and injury while the virus is killed. Proceed with great caution, try little by little, and make sure using all the anti-inflammatory medication you have: steroid, Benadryl, Claritin. Make sure to flush the cytokine out as soon as the patient's heart can tolerate. That is why it is so much better to flush out the virus and curb virus than killing them. The killing of the virus might do harm to the patients.

5. Discussion:

A. Why older patients have more severe cases:

-Less lung reserves.

-On blood thinner, therefore more damage to the lung.

- Other diseases, more complexed management is needed.
- Reduced tolerance to reduced O2 due to heart and other conditions.
- General weakened condition.

B. There is an observation that men have more severe disease and mortality rate than women. Women has period. That helps to get rid of virus and toxin. Now, there are other aspects too, such as women has two X chromosome which codes more immune gene. It is being researched now.

C. There is an observation that Blood “O” type patients have less severe symptoms. This is still to be determined and researched. If true, this further support my point of view that this virus has blood dissolving feature.

D. There is an observation that 55% patient who died has hypertension and 33% patient who died has diabetes. I am not surprised by the association with diabetes. Yet, the association with hypertension is odd. This suggest the direct attack of the virus to arteries, maybe even causing microaneurysm. This is consistent with the pathology findings that virus caused damage in heart epithelial cells.

E. There is an observation that higher mobility rate and mortality rate in patients who live in more polluted areas or smoke. This is no surprise at all.