

COVID-19: Prevention, Diagnosis, Treatment, Prognosis & Specific Population

**Discussions among doctors from
China, Europe, and U.S.**



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1 Prevention

1.1 Medical staff protection

Q1: Prof Corbetta: In Italy, particularly in Lombardia, 10 per cent of doctors and nurses were infected, and in Ohio 6 per cent. How do you face and solve this problem? Do you have any good suggestions for us?

A: Prof Zhong: Wuhan also began with a significant number of health workers infected, with about 3,000 so far. Because most of the patients were in Wuhan, the primary problem was not having enough Personal Protective Equipment (PPE). Second, as in Italy, doctors work 24 hours a day and are too tired to get enough rest. A month later, with more and more doctors and nurses supporting Wuhan, the medical staff can be rotated and have more time to rest and recover. They also had adequate personal protective equipment. As professor Luo says, it is important to have adequate personal protective equipment and know how to use it. After that, there were very few medical staff infections, I only heard of two or three.

Q2: Prof Corbetta: The problem is that in Lombardy, many patients are being treated in hospitals, leading to an increase in the number of infected doctors and even their families.

A: Prof Zhong: This is a very important question that you mentioned. I think in some countries, including initially in Italy, the government or the centres for disease control and prevention (CDC) only looked at patients who had symptoms or health care workers who had symptoms to be tested. They do not pay enough attention to close contacts, such as their families and relatives. Yet close contact is sometimes the most important route of transmission. Two things are important from our data: first, asymptomatic patients (or carriers of the virus) are highly contagious; Second, after being infected, even in the early onset, the viral load is still very high, even after the symptoms disappear or the incubation period has not yet appeared symptoms, there is a high infectivity, easy to spread to others, including medical staff, family members and other close contacts. I read in a newspaper that Lombardy is closed, but people in the city still gather, eat, hold meetings and even party, making it vulnerable to close contact. Although these people have mild symptoms, they recover well and can infect others. The other part, as you mentioned, is between 80 and 89 years old, because of the low immunity, so the case fatality rate is highest.

A: Prof Luo: We should also pay attention to the fact that the infection of medical staff occurs not only in the hospital, but also outside the hospital. For example, a nurse in a hospital is infected outside the hospital. To avoid infecting or being infected by family members, most hospital staff stay in hotels, not at home.

A: Prof Zhong: I want to add one more thing. When I was in Wuhan in mid-January, I met with my students and some medical staff who were infected, but they were not in the infectious diseases department and did not realize how contagious the disease was. The first confirmed cases were in neurosurgery, where 13 doctors were infected by patients who had insufficient knowledge of the disease. So, I think in Italy and other countries, it's not just the infectious diseases department, it's also the other departments that need to be more vigilant.

A: Prof Luo: About other department infection, if some hospital oncology department, the Doctor of Surgery and nurse are infected, but respiratory department and contagion department do not, because they take protection more seriously, often wear mask.

1.2 Hydroxychloroquine & Preventive effects

Q: Prof Lam: Now in the midst of a pandemic, many doctors are caring for COVID-19 patients. Based on the existing data of drug testing, do you think there is a standard for preventive drug use among front line medical personnel? For example, hydroxychloroquine, its side effects are relatively small. What do you suggest?

A: Prof Zhong: I don't think there is any evidence that chloroquine or hydroxychloroquine is effective in preventing infection in medical personnel. Professor Alessandro Bartoloni of the University of Florence mentioned the use of 400 mg hydroxychloroquine in patients on a twice-daily regimen. Our study used 500 mg chloroquine twice a day for 10 days. In addition, we monitored the blood concentration of chloroquine under the regimen, with a maximum concentration of 1.6 mol/L, which was high enough to kill the virus in the body, but far below the toxic concentration. In a study published in the New England journal of medicine in 1988, the average blood concentration of patients who committed suicide using chloroquine was close to 20 mol/L, compared with a much lower blood concentration in the doses we used.

Therefore, we believe that the current therapeutic concentrations used are relatively safe. So far, we have treated more than 20 patients with this regimen, and related papers have been written and submitted. Therefore, this blood concentration is very safe. Massachusetts General Hospital provides guidelines for the use of hydroxychloroquine. There have been no clinical trials of COVID-19 for hydroxychloroquine. However, we conducted in vitro tests in P3 laboratory and found that hydroxychloroquine has similar antiviral activity to chloroquine, suggesting that hydroxychloroquine seems to be useful. Their advice: 400mg twice a day for two days; Then decrement to 400mg once a day for 5 days. They should have reasonable data to support the dose. To my knowledge, there are no controlled clinical trials of hydroxychloroquine. Anyway, I have confidence in chloroquine for the treatment of COVID-19. Whether chloroquine or hydroxychloroquine has a preventive effect, I'm not sure.

1.3 Prevention of new outbreaks

Q: Prof Lam: In terms of slowing the progress of the epidemic, Wuhan's social quarantine has been very successful. But that policy will eventually end. How do you prevent a second or third wave of outbreaks?

A: Prof Zhong: I believe that the epidemic prevention policies in Hong Kong and the mainland should focus on imported cases. For example, some people have come to China from affected areas and, despite having no symptoms, the nasopharyngeal swab PCR test was strongly positive and did not even produce IgM (an antibody produced early after infection). After two or three days in isolation at a designated hospital, he developed a fever. Such cases are highly contagious. We should pay more attention to and prevent such imported cases. We are now starting to double check the so-called asymptomatic healthy people, another test is scheduled in 7 days, if the results are ok, I don't think it is necessary to isolate for 14 days. We are trying to get the government's approval for the quarantine plan. In addition to seeking shorter isolation time for inbound visitors, we are also seeking easier sampling and testing methods.

For example, if the results of peripheral blood and venous blood serological tests are compared, it will be easier to sample if the results are similar. In conclusion, to prevent a second or third wave outbreak, we need to strictly implement these policies and focus on imported cases from abroad.

2 Diagnosis

2.1 Medical Imaging

2.1.1 Bronchoscopy

Q1: Prof Hogarth: I was puzzled by the extensive bronchoscopy because it was of little significance from a diagnostic point of view. And fiberoptic bronchoscopy is a risky procedure that can lead to infection by the surgeon who performed the procedure, preventing more patients from being treated. If a diagnosis can be made without the use of a bronchoscope, it seems to be an unnecessary risk for the patient. What factors may influence whether or not to perform bronchoscopy?

A: Prof Zhong: I agree with you. In terms of diagnosis, there are not many indications that require bronchoscopy. I think the bronchoscopy is based on the need for treatment. In China, we try to treat as many patients as possible, which is a different policy. But I agree with you there. This increases the risk to the bronchoscopy operator. However, we have not found any doctors infected during the bronchoscopy, and we still pay a high price for it. As professor Luo noted, at the beginning, when we found that mucus retention was in a relatively close and large airway, we did this in only a small number of patients. If the mucus is packed in the alveoli or bronchoalveolar, it will be difficult to wash out.

Q2: Prof Criner: I want to ask another question about bronchoscopy. What is your experience with radiographic presentation of “crazy paving” and hypoxemia in patients? Are these patients likely to benefit more from alveolar lavage than those without? Was this a decision based on HRCT results, or was it a decision based on the idea that patients could benefit from alveolar lavage from a therapeutic (rather than diagnostic) point of view?

A: Prof Luo: We have no relevant experience. Because the CT shows “crazy paving”, the patient may be suffering from high fever, or may not have severe breathing difficulties (fibro bronchoscopy is not possible). We sometimes performed bronchoscopy in intubated patients.

A: Prof Zhong: From our group’s experience, most patients actually undergo bronchoscopy during ECMO to prevent further hypoxemia. In some patients, mucus causes airway obstruction, in which case we do bronchoscopy. At the same time, I agree with you that it has limitations.

2.1.2 X-ray

Q: Prof Hogarth: The next question is, the X-ray shows a significant change after lavage, but do you have any objective data to show that this changes the clinical outcome? Because the x-rays appear, the patient may still end up dying of respiratory complications and doing so for the sake of just one patient exposes an already limited medical staff to risk and consumes limited medical resources.

A: Prof Luo: I think the reason for doing this is because the airway is blocked, because something like mucus blocks the airway and causes atelectasis. So, the doctor used a bronchoscope to get rid of these things.

A: Prof Li: My colleague did 3 cases in Wuhan, one of which is now recovering. The second failed with heart failure. The third patient remains in the intensive care unit. This limited data is helpful, but there are some limitations.

2.2 IgG/IgM

Q: Prof Rothenberg: There will soon be an IgG/IgM assay to detect antibody positivity in people. Do you approve of this test? How effective is the test paper? Existing theories suggest that people who work with patients have high IgG positive rates; In addition, it is speculated that in other areas where the number of positive patients is zero, the local people may have relatively strong anti-infectivity, so it is possible to screen and hire such labor to take care of the patients on the front line of the epidemic in some countries (such as the United States) where the epidemic situation is more urgent. Do you agree?

A: Prof Zhong: I think by now the WHO should have issued a document to be able to screen people for IgG positive rates. On the other hand, I think that even if some healthy people have high levels of IgG, they cannot be donors for IgG serum therapy; Only those who recovered from COVID-19 could. In fact, we're doing it, and it's working. I think you are right; we need some IgG/IgM related data to detect the infection rate of COVID-19 in human; This helps epidemiologists predict whether the disease will develop into a regular flu or something else.

I think home isolation can be achieved in the United States, because the United States is different from China, where people live in a small room and there is no room for isolation. As a result, there is no home quarantine in China. In the United States, however, most people have apartments, so home isolation is important. But we should pay more attention to close contact. In the United States, close contact with patients is also followed by nucleic acid PCR, which is used to identify positive cases and isolate them. This is very useful in reducing infection rates.

A: Prof Lam: The question that Rothenberg raised. I have also communicated with Professor Luo on this issue, because his team has been working in Wuhan for two months. I asked them about the antibody levels in the team members, right? However, the positive rate of IgG/IgM is actually very low. There are no antibodies in those who have symptoms. So, I assumed that this new virus, once you get exposed to it, you're going to end up with something. So, I don't think we can use this method to screen who should be on the front line. Although it would be good for health care workers if they did have antibodies in their bodies, if we only had one strain.

A: Prof Luo: Some asymptomatic health workers at the Red Cross hospital have been tested for antibodies. Although there is not enough data, I think their antibody positivity rate should be extremely low. Because if it's positive, they'll ask me for help. Since I had worked at Cincinnati children's hospital in the United States for a year, I strongly advised Mark to be prepared for COVID-19 because there were children and parents in the children's hospital.

2.3 PCR Test

Q: Prof Lam: There is only one COVID-19, and there has been no antigenic drift or antigenic shift, right?

A: Prof Zhong: So far, I don't think so. I have read about the mutation in the paper, but it does not affect the accuracy of PCR because it does not affect the N protein and the polymerase protein, which are two targets for conventional PCR detection.

3 Treatment

3.1 Drugs

3.1.1 Chloroquine

Q: Prof Lam: The results of your chloroquine study showed that the duration of fever in the treatment group was shorter and the viral load decreased more rapidly than in the control group.

So, are there differences in clinical outcomes, mild illness to severe illness rate, intubation rate, case fatality rate, etc.?

A: Prof Zhong: I think the clinical findings will be published soon. We made a quick summary of the viral load decline rate, the effect of turning negative. This is very important for us. So far, we haven't found any drugs that can shorten the time it takes for the virus to go negative. That's why we made the preliminary report public first. We are tracking it and will have more data to share with you in the future.

3.1.2 Tocilizumab

Q: Prof Criner: How do you determine when to use Tocilizumab? Are IL-6 levels tested to determine use? Or is it just based on the available clinical information?

A: Prof Zhong: There is some debate in China. Data from Anhui province, where they tested serum cytokine profiles in all patients, showed that the only indications for Tocilizumab were those with high levels of IL-6. Others use the IL-6 receptor antibody Tocilizumab only in patients with cytokine storm. We're trying to see what happens.

3.1.3 Glucocorticoids & Macrolides

Q1: Prof Criner: What about the use of systemic glucocorticoids or macrolides in China?

A: Prof Zhong: The use of glucocorticoids remains controversial. In our institute, we used glucocorticoids only in patients who progressed to severe disease within a short period of time. Professor Luo will provide some experiences later. We have only used it in this group of patients, using low doses of 2-4mg/(kg/d) for 3-5 days and then stop. Because we found that when some patients were treated with glucocorticoids for more than two weeks and then stopped, they got worse. In some cases, even the patient continues to expel the virus for an extended period of time.

Therefore, I do not think that prolonged use of glucocorticoids to treat cytokine storms in patients is a correct choice.

A: Prof Luo: In our ICU, we have 13 very critical patients. The oxygen saturation was severe to only 35%. We tried to give these patients a large dose of glucocorticoid, the highest dose is 500mg a day, and the treatment time is only 3 days, as professor Zhong said. Eight patients survived from treatment with large dose of glucocorticoid and noninvasive ventilation and were discharged from the hospital. I think the survival rate is very high. However, one patient died of DIC and septic shock.

Therefore, we only used glucocorticoids in patients with rapid progression of dyspnea within a short period of time (3-5 days), and in patients whose CT showed rapid progression within 3-5 days.

For example, when the CT shows that the lesion has increased by half or a third compared to a few days ago, we give short-term, large doses of hormone therapy. If intubation is not possible, try large doses of glucocorticoid plus noninvasive ventilation.

A: Prof Peng: We used glucocorticoids only in patients with septic shock, 200mg of hydrocortisone per day.

A: Prof Luo: Respiratory physicians and ICU physicians have different attitudes toward glucocorticoid use. Respiratory physicians like hormones, ICU physicians don't like hormones.

Q2: Prof Criner: In all the patients you treat, have you found any value in using macrolides as an anti-inflammatory?

A: Prof Zhong: Not yet. We don't have experience about this.

3.1.4 Remdesivir

Q: Prof Criner: How about Remdesivir? Have you had good results with Remdesivir?

A: Prof Zhong: Yes, Remdesivir is coming soon. This was a rigorously randomized controlled study. Based on some of our data, I think Remdesivir is effective in some ways, but not specific. Based on our in vitro studies, Remdesivir appears to be quite good in terms of antiviral activity.

3.1.5 ARDS medication

Q: Prof Lam: Last question for Professor Luo, is there any drug or ICU management advice for patients with mild, moderate and severe COVID - 19? Any strategies for ARDS in these patients?

A: Prof Luo: Almost the same as conventional ARDS, sometimes in very critical situations, we use medium-to-high dose glucocorticoids, which can be very helpful in a short period of time in the early onset, especially in patients with worsening symptoms in the short term and rapid progression of CT lesions within 3-5 days. In the ICU, we continue to monitor for bacterial infections in the lungs, sometimes resistant to most antibiotics. We should pay special attention.

A: Prof Zhong: So far, the only effective treatment is the recovered patient's plasma.

3.2 Instrument

3.2.1 ECMO

Q: Prof Hogarth: I want to ask a practical question. Is there any evidence that patients with specific clinical characteristics are likely to benefit from ECMO, or is ECMO a just simply a bridge to nowhere?

A: Prof Peng: We have performed ECMO 15 times in COVID -19 patients in our department. Patients with low lung compliance and high levels of carbon dioxide may not recover from the ventilator at all periods. It's hard for them to withdraw ECMO. This condition indicates that they may have lung damage.

A: Prof Zhong: In our ward, we think it's particularly important to use ECMO if you're fully on the ventilator, with enough PEEP and enough volume, but the CO₂ is still going up. Use as soon as possible and don't wait until patients develop multi-organ failure.

4 Prognosis and management

4.1 Critically ill patients

4.1.1 ECMO & Drug therapy

Q1: Prof Lam: What medications should doctor use to treat critically ill patients who require mechanical ventilation support? Is chloroquine, hydroxychloroquine, remdesivir, even il-6 antibodies, and glucocorticoids given empirically to inhibit cytokine storms? What kind of medicine will you choose?

A: Prof Zhong: In fact, we only have a few severe cases at the moment. A significant proportion of patients are in the advanced stage of the disease, with multiple organ failure or complications, requiring the use of ECMO. But as far as your question is concerned, I think preventive management is very important. Perhaps the patient will take more mucolytics, such

as a relatively high dose of n-acetylcysteine (0.6g, 3 times daily); As a mucolytics agent, the drug also has antioxidant effects, that's one thing. The second is you can use the enzyme preparation, but don't use before severe breathing difficulties, because when an autopsy found that the existence of a large number of bronchioles and alveolar sputum embolism, now we are using another way of ventilation, namely do not use high flow oxygen therapy nasal catheter (HFNC), but using hydrogen and oxygen mixed inhaling. This treatment has shown very good results, and we are about to get the data. In the second or third stage the symptoms of dyspnea are improved, and the subjective feeling is more comfortable. The logical explanation behind this is that, because the oxygen content of the mixed gas is about 30-50%, its density is much lower than that of the mixed gas. The density and molecular weight of the nitrogen are much higher than that of the hydrogen. Compared with the mixed gas of the hydrogen and oxygen, the mixed gas of the hydrogen and nitrogen is more difficult to pass through the airway. Using a mixture of hydrogen and oxygen instead of a regular mixture of hydrogen and nitrogen for ventilation is a good way to reduce airway resistance.

In this way we prevent the patient from getting worse.

A: Prof Luo: For intubated patients, samples can be collected for virus detection to see if the virus is still present. If they are positive, we should give them antivirals, just like patients without intubation. We have cases where the patient is in a very critical state, where bronchoscopy lavage is difficult to remove the mucus from the distal airway due to the decreased oxygen saturation during bronchoscopy. However, if ECMO is used, small airways can be irrigated, and we have a case like this.

A: Prof Li: During bronchoscopy, volume control, not pressure control, should be the ventilation mode for patients on ventilators. PEEP should not be increased. The same PEEP should be maintained during bronchoscopy.

A: Prof Luo: I agree with professor Li that when we performed the bronchoscopy on the first case in Wuhan, we reduced the PEEP to 5cmH₂O and the oxygenation significantly decreased, so we kept the PEEP at 15cmH₂O and then performed the bronchoscopy.

4.12 Multi-organ failure

Q2: Prof Aronow: What is the rate of patients with severe lung injury who develop multi-organ failure, particularly heart failure? My impression is that the percentage in China is not as high as we see in the United States. Is that possible?

A: Prof Zhong: We don't have the exact data to prove it. At autopsy, the heart did not show much special pathological change. But, of course, some have high blood pressure or other underlying heart disease, which can be a risk factor for serious illness. In terms of the percentage you asked, it varies by region, but as far as I know, if they don't get enough care early on, at least 5 to 8 percent of patients will develop severe illness.

A: Prof Peng: In fact, in my department, nearly 20% of patients in the ICU have a concurrent cardiac injury. The most common problem is caused by pulmonary factors. I think this is caused by hypoxemia which leads to pulmonary hypertension, which then leads to acute cor pulmonale. If we can give the patient enough oxygen treatment, the patient's symptoms will be improved quickly. In addition, about 30 percent of patients developed arrhythmias, most commonly atrial fibrillation.

4.13 Pulmonary fibrosis

Q3: Prof Corbetta: Are sequelae such as pulmonary fibrosis and decreased pulmonary function present in patients with severe COVID-19?

A: Prof Zhong: As far as I know, COVID-19 is not like SARS. In the late period of SARS, fibrosis was obvious. However, in patients with COVID-19, fibrosis was partially reversible despite CT

consolidation and autopsy findings of fibrosis. Even when patients were treated with ECMO or ventilator for up to one and a half months, the post-recovery biopsy revealed only mild fibrosis. So, I'm not worried about their lung function after they recover.

A: Prof Luo: We had two patients who were about 40 years old, and the CT showed that the lungs were very bad, but they recovered, and they were much better. I think the lungs are very resilient in this disease, so as Prof Zhong said, don't worry too much about lung function.

4.14 Viremia & Cytokine storm

Q4: Prof Lam: In terms of those deaths, whether they're due to an uncontrollable viremia or a cytokine storm, if we know the cause, maybe we can develop a treatment plan?

A: Prof Zhong: Yes and no. We carried out lung transplantation in COVID-19 patients. Several PCR tests before the operation were negative, but the virus was still found in the lungs after the operation. In other words, the absence of the virus in the sputum or secretions does not mean that the virus has disappeared from the organ. However, most patients with advanced stage disease still have viremia, and organ damage continues to progress even if a considerable number of patients are negative by PCR. Therefore, I believe that organ damage caused by cytokine storms and viremia that directly causes organ damage are both present. So, in other words, we need two treatments: antiviral and anti-inflammatory.

4.15 Secondary bacterial infection

Q5: Prof Bartoloni: British colleagues asked if there were meaningful signs of secondary bacterial infection in severe cases?

A: Prof Zhong: That's a great question, and I've noticed it. We routinely do blood culture or sputum culture. In COVID-19, there was no obvious co-bacterial infection, and no typical secondary bacterial infection was found in either Wuhan or Guangdong, unlike other secondary infections such as *Acinetobacter Baumannii* and *Klebsiella Pneumoniae*. But many cases of fungal infection have been found. But it's not very clear, because in severe cases, you can isolate some of the typical pathogens, sometimes dominant phenomena, but very few.

I've never isolated *Streptococcus Pneumoniae*. I don't know why, but I really need to find out. A team of my colleagues is doing research on this. People may complain that no typical pathogen has been isolated, perhaps because these patients were initially treated with large doses of a variety of broad-spectrum antibiotics, such as anti-gram-positive, anti-gram-negative, and even fungi, but that's not the main reason. I think there may be other reasons.

That's all I want to say.

4.2 Survivors

4.2.1 Immunity

Q1: Prof Corbetta: Question from the UK: how long can immunity last after the infection has healed?

A: Prof Zhong: IgM, for example, appears within 3 days of onset, then rises, lasts for 10 days, and then declines. The IgG goes up in a week, and it goes up in another week. In general, most of the mild patients I met can last for 2 weeks even without any treatment. There is no evidence that COVID-19 can heal without any treatment, although it is true. However, no one has proved it yet, and I cannot draw a conclusion because I dare not observe the natural course of the disease without treating the patient. In terms of antibody duration, I think it's 2 weeks or more.

Q2: Prof Lam: Is it possible for patients to get antibodies to protect them from secondary infections? Is there a real reinfection?

A: Prof Zhong: For most patients, I think the answer is yes, if antibody levels go up four times from baseline. I haven't seen patients with high antibody levels get reinfected.

5. Specific Population

5.1 Hypertension

Q1: Prof Lam: Studies have shown that angiotensin-converting enzyme (ACE) is the channel and carrier for the virus to enter cells, and the antihypertensive drugs ACEI and ARB can up-regulate the expression of ACE2. So, should the antihypertensive drugs ACEI and ARB be discontinued in patients with hypertension? What do you think?

A: Prof Zhong: I think, in theory, it is. We first noticed this problem during the SARS outbreak. At that time, we had SARS patients using ARB drugs, and for those patients with hypertension but without septic shock, discontinuation of ARB drugs may be one way. (but in patients with COVID-19 infection) we are now using a different approach, namely supplementing recombinant ACE2, to protect lung tissue and improve lung function. I think a lot of people recommend the latter. Judging from the preliminary clinical experience, I don't think the benefit of stopping ACEI and ARB is obvious.

A: Prof Luo: We have some data comparing ACEI and ARB with CCB. At present, the data is being sorted out, and I will share these data with you later.

Q2: Prof Aronow: How likely is it that the use of ACEI or ARB increases the expression of lung related target genes, leading to the transformation from mild disease to severe disease? In fact, ACE2 expression in the lungs is quite low in most normal people. However, I think that the expression of ACE2 in the microvascular structure may be increased in patients using ACEI or ARB. If patients with high blood pressure who are taking these two drugs are at higher risk of developing severe disease after covid-19 infection, should we replace them with other antihypertensive drugs?

Q3: Prof Aronow: I am concerned that people currently taking ACEI or ARB have a higher risk of developing severe disease after covid-19 infection, because these two classes of drugs increase the expression of ACE2 in the lungs. Is there evidence to support this view?

A: Prof Zhong: No, I don't think so. No study has shown any relationship between the two.

5.2 Children

Q: Prof Lam: In the early stages of transmission, I saw that covid-19 did not pose a serious threat to children, but in the United States, some of the child patients died from the disease. What's the difference between America and China?

A: Prof Luo: When I was supporting the Red Cross hospital in Wuhan, there were no children in the hospital. But I asked some patients, and their grandchildren had a fever for 1-2 days and recovered quickly. But I don't know if the children still have the virus and can still pass it on to others. This problem is worth studying

A: Prof Zhong: A paper from Wuhan reported that a child was infected with COVID-19. I didn't read the article carefully, but it showed that only 2 to 3 percent of the children became seriously ill, and the symptoms were mostly related to the digestive system, such as diarrhea and vomiting.

Most children are milder and recover more easily.

5.3 Asthma

Q: Prof Aronow: Is there evidence that children with asthma are more likely to develop lung tissue lesions associated with COVID-19? Will the disease worsen?

A: Prof Zhong: We are currently collecting data on whether asthma patients are more susceptible to COVID-19. Our preliminary findings suggest that eosinophil counts are low in most patients as the disease progresses. End-stage patients are often associated with leukopenia and eosinophilia.

The relationship between allergenicity and COVID-19 is exactly what we intend to further study.

In addition, there are some patients with significant increases in eosinophils and IL-6, in which case we may choose Tocilizumab. We conducted a study of more than 100 samples, comparing the differences between Tocilizumab and the control group, and the results will be announced next week.

Discussion Experts

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Statement

For the speech in the COVID-19 Webinars organized on March 25 & 27, 2020, speakers agreed to share the video to any individual who may need it, however the exercise of such right shall be for the public interest, and the right is perpetuate and worldwide. Transcript in this document is referring to the discussion session of webinars. Should there be any discrepancy between video version and this transcript, video version shall prevail.

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