



China with the World: COVID-19 Experts Dialogues

The 6th Talk

March 24, 2020



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As one of the leading professionals in Critical Care Medicine in China, Prof. Peng has extensive experience in clinical research, education and practices, with his particular focus on cellular metabolism, sepsis, clinical pharmacology and drug development.

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Prof. Chiche has written more than 140 papers in peer-reviewed scientific journals and is a regular reviewer for major international journals. He has extensive experience as an investigator and DSMB member on major international studies in ARDS, mechanical ventilation, sepsis, sedation and cardiac arrest management.



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Assoc. Prof. Mirosław Czuczwar

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Assoc. Prof. Czuczwar is one of the precursors of VV-ECMO in Poland, the founder of the first center in Eastern Poland with access to such a wide range of diagnostic and therapeutic facilities, enabling treatment of patients with the most severe forms of multi-organ failure. He is also a member of the working group for developing guidelines and recommendations for critically ill patients with COVID-19 in Poland.



Assoc. Prof. Mirosław Czuczwar: Hello everyone. Welcome. It's a great honor for me to be able to host this discussion. First of all, many thanks to all of you who have decided to join this event and share your expertise with us. We are very grateful for that.

I will start with a brief presentation of all of us here, especially our distinguished guests from abroad. I would like to start with Professor Zhiyong Peng. It's our friend from People's Republic of China. He's a professor of critical care medicine and anesthesia, and the Chair of the Department of Critical Care Medicine from the School of Medicine in Wuhan. Professor Peng has visited Poland recently. He was our guest in Poland last year. We couldn't imagine what would happen with the COVID situation back then, but now we are very happy to have you here with us. Thank you.

Then, of course, another guest, Jean-Daniel Chiche, former president of ESICM and a member of the steering committee of Surviving Sepsis Campaign, a full professor of critical care medicine in Paris Descartes University, and he's currently working in the medical ICU of Cochin University Hospital in Paris.

And, I would also like to give a warm welcome to Professor Radoslaw Owczuk, Chair and Head of the Department of Anesthesiology and Critical Care of Gdansk University, and also a National Advisor Consultant to the Polish Minister of Health.

I'm also an anesthesiologist and critical care physician, and I'm Head of the Department of Anesthesia and Critical Care in Lublin University, and I'm also the Head of the local ECMO Center. So, I think now with everybody knows who's who, I would like to give you the opportunity to share all the most important facts, what we have learned during the pandemic. And now I would like to ask Professor Peng to give a brief talk about his experience with the COVID-19 outbreak. Professor Peng, you are welcome to start. Thank you.

Prof. Zhiyong Peng: Hello, everyone. Thank you for inviting me. I'm Doctor Peng from the Department of Critical Care Medicine, Zhongnan Hospital, Wuhan University. It's my honor to share my experience with you. Actually, we have learned a lot from our patients in the last couple of months. Today, my topic is what we learned from our COVID-19 outbreak in Wuhan.

So, in the early stage of the outbreak, we needed to prepare for the medical resources. The resources, including the medical beds, ICU beds, all the medical professionals are limited. So, we needed to mobilize the medical resources under the help of the hospital authority or the help of the government; and we need to organize the new team for our patients. Especially we need to increase the ICU beds for our patients. The more ICU beds, the more patients will be saved. The ICU size, the ICU beds in my hospital, almost tripled during this outbreak.

So, it is difficult for us to recruit the intensive staffs, but we can recruit the physicians from the anesthesia department. During this outbreak, the hospital closed down. So, we can recruit physicians from other specialties. My approach was to try to recruit the physicians with the similar training with us, so anesthesiologists are the best choice for us. In Europe, most of the ICU belong to the anesthesia, but here in China, we separate them. So, for me, anesthesiologist is the top priority for us to recruit.

Personal protection is also the top priority for our medical professionals. We need to prepare all the PPE, including the gloves, the gowns, protective suits and also the masks, the N95, goggles, face shield and the hood. And we set up the protocols for the precautions for droplets, close contact and airborne. And also, we have the protocols for how to wear the PPE and how to take off the PPE; make sure everyone can follow the protocols. This is highly important for us. And also, we

monitor the ICU environment regularly to see how it is – any positive virus in the environment. So, these are all important for our ICU professionals.

Here, I'd also like to talk a little about the clinical features for our patients in the ICU. As you see, the PaO₂/FiO₂ ratio is quite low in our patients. It's only 115. We measure the lung compliance, also quite low, around – the average is only 22. And the IL-6 level also is quite high. And almost 72% of the patients require intubation. Only 28% of the patients can survive from only the non-invasive mechanical ventilation. For the patients requiring intubation, small part of these patients were switched to ECMO. And most of the patients requiring prone position ventilation. Also, 90% of the patients had severe ARDS, and others complicated with their heart problems, including the arrhythmia and also acute heart injury. So, we routinely monitored the cardiac function, and used the bedside TDE, the echocardiographic, to check the cardiac function in the patients. 20% of the patients had AKI. This kind of patient is quite sick in our ICUs.

Lung protective ventilation is highly important, and we should focus on this point. We try to prone these patients as early as possible, and we evaluate the parameters we set for the ventilators regularly, and to change if the parameter is not appropriate for the patients. Also, we titrate the PEEP and tidal volume based on the transpulmonary pressure, if possible, or the driving pressure. Keep the driving pressure less than 15 and the plateau pressure less than 28.

Actually, for our patients, we set the PEEP relatively lower compared to other ARDS patients. Most of the patients, we started the PEEP at less than 10 centimeters water. And also, the acute Cor Pulmonale also were common in these patients. I think it's induced by severe hypoxemia and the severe hypoxemia induced pulmonary hypertension.

This also, highly important. As the severe acute Cor Pulmonale, it will compromise the left ventricle function; it will induced the lower cardiac output. So, if we give enough oxygenation for these patients, they will be improved soon. Also, be careful of the lung recruitment maneuver. Even when setting the highest PEEP, it's quite low compared to the patients from other ARDS. So, these patients are likely to have pneumothorax, if we set a high level of the PEEP.

Here is the flow chart for the ventilation supports we prepared for our patients. We based on the P/F ratio, like if they're 200, 300 or if they're around 150 to 200. So, if the P/F ratio is okay, we start from the high flow nasal cannula first, and we just evaluate whether this works or not for 2 hours. If we base on the ROXI score, ROXI score is calculated from the respiratory rates and the saturation, and also the other parameters. So, this is our flow chart for the patients. But if it didn't work, we switched to other models. Also, we try to give non-invasive ventilation. We set up the IPAP around 8 to 12. EPAP is 5 to 8 centimeters. We observe for about 2 hours. If the tidal volume is too high, then we will intubate the patients. As I just mentioned, we try to prone the patient as early as possible, even when the patient is still conscious. And if we intubated the patients, we also try to perform the recruitment maneuver to see if the patient has the capability. And also, we adjusted the PEEP, just as I mentioned, based on the driving pressure. So, this is the flow chart that we set up for our patients.

And for the use of ECMO, if we tried all the patients for a while, their P/F ratio are still quite low for about 6 hours, then we will try to switch to the ECMO. Actually, we have performed 15 ECMO already for our patients. This is what we have learned from our patients with the COVID-19. I fully understand what you are facing, so I am happy to take any questions from you. Thank you for your attention.

Assoc. Prof. Mirosław Czuczwar: Thank you, Professor Peng, for this very insightful presentation. We will have a chance to ask questions and have a discussion on the topics you presented later on. Now, let's switch to another presentation. We have Professor Chiche with us. And now, can I have the next presentation on the screen?

Prof. Jean-Daniel Chiche: So, thanks for giving me this opportunity. It's a great pleasure to have the opportunity to discuss this, especially with my good friend. I was in Wuhan not long ago, before it all started. None of us could have guessed that this was coming. I'd like to follow on the discussion that Professor Peng has started on mechanical ventilation, because as we are still struggling to know whether that would be a good anti-viral strategy, and that does not appear actually so far. So, we still have very much to rely on the symptomatic treatment, and mechanical ventilation plays a very important role in this as highlighted by Professor Peng again. Whereas we all understand that there might be some slight differences between ARDS from different etiology, we also have to remember that we are going to ventilate, and we now ventilate many patients with quite sick lungs.

I would say, the strategy that we have developed and that is deployed over the country, and by large over the large Paris region is to follow recommendations that have been published quite recently in another intensive care medicine, which are formal guidelines for the management of respiratory distress syndrome—acute respiratory distress syndrome. In this expert recommendation, we came up in the end with 15, I would say, sound recommendations for therapeutic algorithm regarding the management of these patients. I'd be very interested to see whether Professor Peng would see some value to apply these algorithms, because what you told us in the past minutes is very much in line with what I'm going to propose in this algorithm.

The first and probably most important thing is really to focus on delivering lung protective mechanical ventilation to these patients. And lung protective means serious lung protecting. I believe that when you see what's at the bottom part of the slide, you can see that following the initiation of invasive mechanical ventilation with sedation in the ICU. We are going to target a tidal volume of 6 milliliters per kilogram of predicted body weight, and we are going to tolerate acidosis. As long as the pH is greater than 7.2, we don't care too much about the PaCO₂.

In Professor Peng's approach, you were speaking about the use of non-invasive ventilation in the high flow nasal oxygenation, which for us has not been used extensively so far, because we are concerned about the potential for our isolation of the virus with high flow nasal oxygenation and non-invasive mechanical ventilation; and also, because we know that in the most hypoxemic patient, it's going to be associated with a significant failure rate. And what I mean by "significant" is roughly 50%.

The other thing is that we've been quite impressed to see that many of these patients do okay with, I would say, three to five liters per minute of oxygen. And, I would say, all of a sudden, they required more oxygen, and these patients that have sub-acute to acute deterioration of oxygenation are going to be quickly incubated. But for us, soon after incubation, we really focus on delivering safe mechanical ventilation. We have a tidal volume of 6 milliliters per kilogram of predicted body weight, a control of plateau pressure.

And indeed, we will start with, I would say, a reasonable PEEP level—and by "reasonable", we mean they always have more than five, but we don't go directly to the super PEEP that has been discussed and proposed by some authors. Obviously, when a patient gets more

sick, then this is where we have to consider something more, I would say, personalized for the validation of PEEP level in these patients. And for this, what we do is to focus on the most severe patients - the patients that have the PF ration lower than 200. These are the patients in which we are going to try higher PEEP level; and by higher, we mean that very often it's going to be beyond 10 or 12 centimeters of water, provided that we control the driving pressure and maintain the driving pressure below 13 to 14 at maximum. Obviously, most of these patients will have to be heavily sedated. They will have to be sedated quite heavily.

And the next thing that will come is – what we'll try to do is then – to find the adequate PEEP level for these patients. And for these, what we do is to do a PEEP responsiveness test, and there are several ways to do it.

Our approach is to increase PEEP from five to 15, and look at whether you have a significant increase in the pressure, PF ratio, together with stable PCO₂ and stable compliance. If you have an increasing P/F ratio greater than, I would say, 15% to 20%, while PCO₂ remains stable or decrease, and compliance remains stable or increased, we believe that these patients are PEEP responsive; and these are patients for which we are going to target a higher PEEP level with a maximum plateau level – plateau pressure of 27 centimeter of water while maintaining the driving pressure below 12 centimeters of water, even if this means further decrease in the tidal volume. This is what we call in this algorithm, the maximal recruitment arm.

Whereas, patients that are not PEEP responders, patients who don't see a significant increase in PF ratio, or patients in which you can see that there is a sudden deterioration in PCO₂ or compliance, these patients may not actually benefit from higher PEEP. And as Professor Peng told us in his experience, in these patients, we really target a

lung protective approach with six ml per kilogram, and more or less follow the PEEP at FiO₂ algorithms that have been proposed by several investigators before, like in the NIH ARDS network. It's quite difficult actually to know whether such a strategy is going to be associated with an improvement in survival, but this is something we are going to test in a randomized controlled trial, where patients that could be deemed responsive to an increase in PEEP, will be treated like this; and patients that have no potential for our equipment will be rather kept on the protective set.

Finally, I'd like to insist on one thing before we discuss ECMO, that when the patient really gets severe, it's really important that we apply the recommendations, and the recommendations are to keep these patients on neuromuscular blocking agents and to use prone positioning in these patients. I cannot stress this enough. This is probably one of the most important part of lung protection today in these patients. And in our experience so far, I would say, 80% of the patients have received prone positioning, and we have seen less need for ECMO in these patients. So, these were the things that I wanted to share with you, and I'd be very happy to discuss this with all of our colleagues, and answer questions if there are questions later on.

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Q (Assoc. Prof. Mirosław Czuczwar): Since we in Poland still are on the rising tide, we still don't have a lot of experience with those patients, because our cases are quite limited for now, luckily for us. I think we will move straight to the questions and answers part.

So, I would like to ask the speakers to try to type some of the answers through our chat module. I will also approach all of you directly with the questions which were sent to me. So, I think we will start with Professor Peng, if everyone is okay with this, because I have noticed that there was a very high use of anti-microbials in your patient populations in Wuhan. Professor Peng, please tell me, did you start the anti-microbials at admission or when bacterial super infection was suspected or diagnosed? When did you start them, and for what reasons?

A (Prof. Zhiyong Peng): And actually, personally, I don't know why they used antibiotics initially. In ICU, we will use antibiotics if we have the evidence: the patient have a secondary infection. And also, if the patient has a positive culture result, from the blood, from the BAL, then we try to use the antibiotics for the patients. Initially, for the patients staying in ICU for more than 10 days for intubation, we will try to use the antibiotics for prophylaxis. But only if we intubated the patient for at least for one week, then we use the antibiotics for prophylaxis. So this is the indication that we use the antibiotics in ICUs.

Usually, it depends on the situation: If we have the evidence, we will use antibiotics; if the patient admitted into the ICU is at an early

stage without any evidence of a secondary infection, we won't use antibiotics for the patients.

 **Q (Assoc. Prof. Mirosław Czuczwar): Thank you very much. And now I have a question for Professor Chiche. There is a little confusion about the latest COVID-19 surviving sepsis campaign guidelines because recommendation 38 clearly states that giving anti-microbials is beneficial over not giving anti-microbials, even in the case of a lack of proof of a bacterial infection. Can you comment on this, on the rationale of this recommendation?**

A (Prof. Jean-Daniel Chiche): The rationale for this recommendation is admittedly quite weak. And I think that this can be, I would say, adjusted based on your attitude to diagnose superinfection in these patients. Our experience is that the superinfection is not that common. It's probably less common than the flu. And what we tend to do is to use PCT on ICU admission, and in patients that have a negative PCT, we don't give them antibiotics. We may give them antibiotics if the PCT is high, while waiting for the results of the culture. But if the culture is negative, we stop antibiotics as well.


So, I believe that, indeed, this recommendation 38 is probably going to through a lot of controversies, and I would recommend – you know, obviously, I don't want to underestimate the work that has been done and the importance of these pandemics – we should not lose our brain and our habits of being good doctors; and being a good doctor means you should give antibiotics

when you have a bacterial infection, okay? Not because you fear bacterial infection. It's not because you don't have a potent anti-viral treatment that you should do anything. And the most important thing is to keep doing the right thing and apply some physiology at the bedside and buy time. And it's going to take time. Most of these patients require—I'm sure that Professor Peng will confirm it – they require 10 days, 14 days, sometimes up to 3 weeks of mechanical ventilation. Sometimes when you start to taper sedation, they worsen again. So, no systematic antibiotic, I would say.



Q (Assoc. Prof. Mirosław Czuczwar): In my personal opinion, the heavy workload of the procedure might limit the availability of proper ICU treatment for other patients. But if you had to name a patient phenotype suitable for ECMO with COVID-19, who would it be? What kind of patient in your opinion is likely to benefit from VV ECMO therapy?

A (Prof. Jean-Daniel Chiche): In our experience, when you follow, and again, we don't see as many patients as Professor Peng today. But we have already done like 50. In our experience, the number of patients that need ECMO is not that high when you follow the recommendations and when you actually set the right PEEP level. When you use prone positioning early on, the number of patients get the ECMO criteria is not that high.




Q (Assoc. Prof. Mirosław Czuczwar): Okay. So, could you please comment on the Oklahoma Heart Institute's prediction score for VV ECMO in COVID-19? Do you think that this might be a feasible tool for identifying the right patient?

A (Prof. Jean-Daniel Chiche): I would say – I would use the risk score that has been developed in France. But again, the algorithm that I presented to you, I think, makes a lot of sense because it's a stepwise approach, and it doesn't lead you to have a patient on ECMO that hasn't been in prone positioning before. I don't really believe that many patients should go on ECMO directly. I think that, so far, we haven't seen – what we've seen, for instance, we have H1N1 flu where you see sometimes patients where from day one, you realize that their compliance is very, very, very, very low, and that the proportion of potentially benefited patients is really small.



Q (Assoc. Prof. Mirosław Czuczwar): Thank you, and now I will ask Professor Owczuk to give a short comment.




Q (Prof. Radosław Owczuk): Thank you. I have two questions. The first one is to Professor Chiche. Let's go back to Surviving Sepsis Campaign guidelines and the rule of nitric oxide, because it may be a really attractive proposal for some individuals. But I'm afraid that there will be problems with equipment in some places. So, what's about prostacyclin in the event of this, instead of nitric oxide?

A (Prof. Jean-Daniel Chiche): So, the strength of recommendation for nitric oxide, as well as for prostacyclin is going to be very low. If you have access to nitric oxide as a gas, clearly the efficiency in terms of improving gas exchange is, I would say, more documented than prostacyclin. I actually believe that we don't have the answer. I don't know whether nitric oxide is useful or not for ARDS patient, because all the studies that have been done before the era of lung protective ventilation. The latest PRCTs published in 2010, the tidal volume was 10 milliliters just per kilogram. So, if you use a tidal volume of 10 milliliters per kilogram, nothing is going to work for you. So, if you have access to nitric oxide, if your patient is severely hypoxemic, after muscle relaxation, after being put in prone position, you can give it a try. And even if you don't really have the apparatus to monitor, just using the smallest dose available may actually help your patient, especially if your patient has, I would say, some indication of right ventricle dysfunction, or right ventricle failure.

A (Prof. Radosław Owczuk): Thank you. And the next question may be to everybody, the question about high flow nasal cannula, because it may be controversial. It's advised, but I'm afraid that it is necessary to perform this procedure in specially prepared rooms. So, what's your opinion in normal conditions?

A (Prof. Zhiyong Peng): So, actually, we are also concerned about this issue, using the high flow nasal cannulation. I prefer using this technique in the environment with negative pressure. Because we compared the virus level in the ICU with just regular opening of the windows, and the others with negative pressure. Sometimes we found positive virus nearby the machine when we were using the high flow technique. I don't think it is the safe way for this technique using in the routine environment in the ICU. We usually use this technique in the ICU negative pressure environment.

And also, in our ICUs, it's only a small part of the patients benefitted from the high flow. Most of the patients, as I just mentioned, 70% of the patients require intervention in our ICUs; only 20% of the patients were receiving the non-invasive ventilation. But the quite small part of the patients benefitted from the high flow technique.

 **Q (Assoc. Prof. Mirosław Czuczwar):** Okay, thank you very much. We also have some participants outside, let's say, ICU anesthesia environment. We have some surgeons, and there is one question from them. How should you work with the COVID positive patients in the theater? I mean, do you have any recommendations regarding safe conduct of any surgical procedure, I mean, apart from strictly anesthesiological recommendations? I think Professor Peng would be ideal to start answering this question.

A (Prof. Zhiyong Peng): So, actually in my hospital, we have performed 80 cases with the COVID-19 in the OR. We opened a room with the negative pressure. So, this is quite important for all the medical staff there. Also, for the personal protection, it depends on the procedures. If the procedures—I mean, they have some procedures related to airborne production, probably they will use the highest personal protection equipment. So, it depends on the procedures. So far, no any medical professionals work in the OR got infected there.

Q (Assoc. Prof. Mirosław Czuczwar): Okay. Professor Chiche, can you share some information regarding this topic with us? The peri-operative setting, I mean, COVID-19 patients undergoing procedure, usually emergency.

A (Prof. Jean-Daniel Chiche): Okay, so for now, I would say we have absolutely no experience, because all our COVID-19 patients have not needed surgery. But what's planned – yeah, for now, they really behave like medical patients and none of them require any surgery. If that was to happen, at least there is one thing where – there's one place in the hospital where they know something about infection control, and this is the OR, that we're not actually worried that much about that aspect.

The aspect that worries us much more is when patients are discharged from the ICU and they can be extubated. Some of them are still, I would say, potentially contagious, and we have to send them to COVID-19 plus environments where the training for isolation procedure may not be as strong.

Q (Assoc. Prof. Mirosław Czuczwar): That's an excellent topic for further discussion, because we actually had one patient who was ventilated for 12 days. Then his clinical condition improved and we decided to run the RT-PCRs and we got two negative results. So, we decided to get him out of the COVID-19 positive environment. And now, do you believe, this also should be a protocolized procedure because we actually do not have any experience nor guidelines on that. So, how would you extract a patient

still on a ventilator from a COVID-19 positive environment? Do you have any recommendations for us? How would you do this?

A (Prof. Jean-Daniel Chiche): Professor Peng, you have the most important experience.

Q (Assoc. Prof. Mirosław Czuczwar): Do you have a protocol for extracting patients who are no longer in need of mechanical ventilations and are COVID-19 negative? So, I mean, when do you make a decision to consider the patient no longer dangerous to the healthcare staff or no more contagious? Do you have a protocol for saying, "This patient is no longer a threat to the healthcare professionals or other patients?"

A (Prof. Zhiyong Peng): At least we needed to measure the PCR for 3 times. If all 3 times are negative, and the patient is without any symptoms, and also the CT test improved a lot, then we considered the patients relatively non-contagious to others. So, if possible, we will also follow the antibody. If the patients have the antibody, it is the IgG positive, it probably is okay. But I mean it for consecutive 3 times negative. So, it's distinct for the patients without any problem of the transmission.

Q (Assoc. Prof. Mirosław Czuczwar): So, what you're saying is that we should carefully monitor the clinical symptoms, imaging studies and finally perform the RT-PCR or the antibodies, right?

A (Prof. Zhiyong Peng): Yeah, RT-PCR at least 3 times negative.

Q (Assoc. Prof. Mirosław Czuczwar): Okay, alright. And when this patient is declared to be non-contagious anymore?

A (Prof. Zhiyong Peng): And also, we needed to quarantine for the patients at least 2 weeks. And then, check again, and then still negative, it's okay.

Q (Assoc. Prof. Mirosław Czuczwar): Okay. So, we have touched the subject of imaging studies. What's your opinion on the role of chest CT scans as a screening tool or treatment monitoring? Do we really need a chest CT scan to monitor the disease, or perhaps the lung ultrasound might be a sufficient tool to do that?

A (Prof. Jean-Daniel Chiche): I absolutely agree. I don't think it makes any sense to put these patients through the CT scan neither for diagnostics. Those are really small. They are better on PCR than on CT. You will find ground glass opacities, yes, as in many other disease. It's very, very common in patients with COVID-19 infection, and it does not really help you to set the ventilator, especially if you think what you're going to do is to set the most protective approach, to take the most protective approach. So, I would not take a risk for a patient deterioration and dissemination of infection just to get a nice picture of the CT scan.

A (Prof. Jean-Daniel Chiche): We need time, and we need to make sure that we adapt our capacity to face the number of patient that we get. Because clearly when these patients are in your ICU for 2 or 3 weeks on mechanical ventilation, you are going to face a problem in capacity; and this is really the thing you want to avoid. So, don't do anything silly.

Q (Assoc. Prof. Mirosław Czuczwar): Speaking of supportive therapy, we have a question from Professor Owczuk regarding the CRRT and AKI. Mr. Owczuk, can you comment on that?


Q (Prof. Radosław Owczuk): Yes. I would like to ask about the acute kidney injury incidents, especially in China, and the role of CRRT, the mode of this therapy.

A (Prof. Zhiyong Peng): So, actually, in my ICU around 35% of the patients developed AKI. And of these patients with AKI, half of these AKI patients requiring the RRT therapy. So, I mean, the proportion almost is similar to the population in other ICU patients. So, I fully understand the problem with the patients in your level. You have a high chance of the AKI, and I heard the news, but I don't know why patients have a high chance of AKI in the different populations.

Q (Assoc. Prof. Mirosław Czuczwar): Sorry, I have just received a message, and Professor Chiche is going to have to leave us. So, Professor Chiche, can you quickly comment on the role of CRRT in your opinion in treating the COVID-19 patients?

A (Prof. Jean-Daniel Chiche): We see, I would say, 20% of the patients that develop acute kidney injury. Many of them, they come profoundly dehydrated after a high degree fever for a long time and may need ventilation for a long time. For now, I would say that 15 to 20% of these patients will require extra renal replacement therapy, but it's nowhere near the 50% that we've seen and heard somewhere in the literature. For us, it's more 15 to 20% and no more. I'm sorry, I have to go, we have crisis management.

A (Assoc. Prof. Mirosław Czuczwar): We understand. Thank you for your participation and see you, and good luck, Sir. Let's go on then, and we have another question from our participants. One of our colleagues is concerned about the situation which hopefully we won't face, but let's imagine that in a couple of weeks, we will have all of our ventilators busy and running, and the patients will be still coming towards our doors. Now, what do you think might be a reasonable approach? We have already discussed this a bit, so a lottery might be one answer, but do you think that we should be ready for such difficult times? Do you think we can prepare for that, or is it just going to be a catastrophe?




Q (Assoc. Prof. Mirosław Czuczwar): Professor Peng, did China reach this stage, or did you manage to avoid such hard and difficult decisions?

A (Prof. Zhiyong Peng): Actually, this is the difficult approach. Also, in the early stage of the outbreak in Wuhan, we faced the lack of the medical resources. And also, we tried to triage these patients, and tell them, "okay, you should stay at home, you should stay in the temporary shelter, and if you have some problem, you just call us and try to avoid rushing to the hospital".

We have a very difficult period for almost 10 days. A lot of the patients rushed to the hospital, and they try to seek the medical care, but without any – actually we haven't enough space for the patients. So, this is also the problem (that) induced the serious transmission in the hospital, because all rushed to the hospital.

So, I mean, if we could go back to the time, I would first – we try to have the COVID-19 patients by the tele-medicine and try to avoid them to come to hospital. And also, for the hospital, we try to open more medical beds, try to open more the ICU beds for the patients to prepare for the outbreak. We did it before, but unfortunately, in these attempts we failed, and this is a big issue to induce the huge number infected in the hospital.


I mean, we tried to avoid that, try to avoid patient rushing to hospital. This is very important for the lessons of what we learned before.



Q (Assoc. Prof. Mirosław Czuczwar): I understand. And now, we have a question from our participants regarding the routine use of neuromuscular blocking agents. We have all been there. We remember the ancient times in critical where everyone was given these drugs. And now it seems that it might be feasible to take a big step forward. Now, what's your opinion on administering these drugs for the sake of the healthcare professionals' safety? Because there are no clear indications besides the acute period. But now, let's face it, some of us will try to protect themselves by limiting the exposure risk.- Professor Peng, any comments on the issue of neuromuscular blockades?

A (Prof. Zhiyong Peng): Yeah. So, actually, for treating your patient, we fully paralyzed the patients, and also, we tried to make all this process smoothly. So, this is quite important to make the patient comfortable, make all the physicians comfortable during this procedure. And we prepare very good protection. We wear the hood during the procedure. I mean, this is for when they're treating the patient.

For the mechanical ventilation, actually we use much more muscular relaxants for the patients because these patients have the severe problem, the lung problem. As I just mentioned the PEEP we set is relatively lower compared with the other ARDS patients. So, if we increase the PEEP, actually the plateau pressure increased more, and it means the driving pressure was increased. In this situation, we considered that the patient has the compliance problem, and then we would paralyze the patient. And also, of course, we prone the patients at least for one day and to see what happened in those patients. So, this is the way we used for the mechanical ventilation.

 **Q (Assoc. Prof. Mirosław Czuczwar):** Okay, thank you very much. And we have quite a lot of questions regarding the monitoring of severity of disease basing on immunological markers. Now, I think that CRRT is not our best option, and of course, PCT also. So, do you have any insight on the possible role of other biomarkers which would help us monitor the progression or regression of the disease? Any thoughts here Professor Peng?

A (Prof. Zhiyong Peng): Actually, we routinely measured the IL-6 level for all these patients. And also, we found if the patients are with the high IL-6 level, it will come with poor outcome. Also, we monitored lung compliance. In the first day of the intubation, if we found the initial compliance level is lower, it also indicated the poor outcome for the patients.

Q (Prof. Radosław Owczuk): Professor Owczuk would like to add a comment.

A (Prof. Radosław Owczuk): I would like to ask about safe prone position, because it's recommended for these patients. I think that Professor Peng has huge experience in safe positioning, because it may be dangerous both for patients and for our staff because of this connection of circuits, extubation, etc.

A (Prof. Zhiyong Peng): Of course, we should have the detailed protocol for how to perform the prone position. At least we prepare 3 personnel for this procedure. And also, if the patients have the severe hypotension, I mean, requiring norepinephrine more than 0.2 micro per kilo per minutes, then we think this patient probably is hemodynamic unstable, and we wouldn't prone this kind of patients with the hemodynamic unstable.

Otherwise, if we prepare well for prone position – we keep all the line, all the tubing, everything is okay – this wasn't a big problem for us, because we have a lot of the experience before the outbreak of the COVID-19. We performed a huge number of the prone position in our ICUs. I mean, this is not a big issue for safety. Okay, be careful for hemodynamical unstable. So, if the patient has the hypotension, low blood pressure, be careful about that.

Q (Prof. Radosław Owczuk): What about pregnant females, especially in late phase of pregnancy?

A (Prof. Zhiyong Peng): Actually, I haven't seen the pregnant lady with the infection of the COVID-19. With the ARDS, we needed to prone these patients. So, if for the pregnant lady, I won't prone these patients.

Q (Assoc. Prof. Mirosław Czuczwar): Okay. When we discuss the issues of potential problems and pitfalls of patients' positioning, I think we should also mention the possibility that CPR should be implemented. Now any comments on that? I think it's a good question for Professor Peng. Did you have a chance to resuscitate, perform cardio-pulmonary resuscitation in the COVID-19 positive patients? Can you give us – provide us with any details?

A (Prof. Zhiyong Peng): Actually, we had before, and of course, the safety is the top priority for our medical professionals. So, this is the issue, for safety. We try to avoid the transmission from the patients during the procedure. Also, these patients, most of the patients have the cardiac arrest due to the severe hypoxemia. So, if we improve their oxygenation of the patients, it's easier to recover from the cardiac arrest. So, this is the point for those patients with the COVID-19. I mean, we have – we had this problem with sudden cardiac arrest because this patient with a long time severe hypoxemia.

Q (Assoc. Prof. Mirosław Czuczwar): Okay, so the general impression is, even if you attempt a CPR, it would likely be unsuccessful, right?

A (Prof. Zhiyong Peng): Yeah, of course. So, it depends – especially the patients admitted in the ICU with the cardiac arrest. It's not easy to recover this patient, because I don't know how long the patient has had the severe hypoxemia already. So, it depends. If the patients – sometimes we found the patients in the ICU also had cardiac arrest, but these patients are easy to recover. It depends on the situation.

Q (Assoc. Prof. Mirosław Czuczwar): But can you give us any data, preliminary data on the results of CPRs in these patients, or are they unavailable right now?

A (Prof. Zhiyong Peng): In my ICU we took the patients with the cardiac arrest. So, for this kind of patients, the outcome is always, always not good; always complicated with the neural damage. But if the patients who had the cardiac arrest were in the ICU already, these patients are always easy to recover without any neurological complications.

Q (Prof. Radosław Owczuk): I hope it will never happen, but I'm afraid there will be some places with the shortage of ventilators. What's your impressions about the usage of one ventilator to two patients?

Q (Assoc. Prof. Mirosław Czuczwar): Okay. So, does anybody have any experience? Because we had some data on this subject. I think there is a company, or a few companies trying to implement such solutions.

A (Prof. Zhiyong Peng): So, actually, we are also concerned about this issue, and we used a filter when we used ventilators for the patients. I'm not sure if it's enough. There is only a filter inside. So, this is the issue we're concerned about. We don't know how to sort it out for this problem.

Q (Assoc. Prof. Mirosław Czuczwar): Okay. And we also had a lot of questions from our participants regarding possible treatment options. Now could we provide our guests with some insight on the role of steroids in managing COVID-19? Because in my opinion, the role is quite limited. Do you agree?

A (Prof. Zhiyong Peng): This is also a controversial issue. Based on the previous report, the steroids don't work for the virus, pneumonia patients. Also, in our guideline issued in China, there also is limited use for the steroids. It's only for if the patient's situation deteriorated rapidly, such as the P/F ratio going down rapidly, or the chest CT significant changes within one day or a couple of days, then we recommend you to try a small dose of corticosteroids. It's around one mg per kilo, per day, for 3 to 5 days. So, this is the minimal dose of steroids for the patients. Also, if the patients are complicated with the septic shock, of course we use the steroids for the patients. But otherwise, we should be cautious for the steroids use for our patients.

Assoc. Prof. Mirosław Czuczwar: Okay. So, I think that we have discussed most of the topics we planned to. So, I think that it's time to end our meeting. I would really, really, really like to express my deepest gratitude to all our experts. Thank you very much for your valuable insight, for your time. I hope that together we will overcome this pandemic situation, and we will have a chance to meet in a couple of weeks, maybe months to discuss all the things that we have learned so far.

So, thank you. And now, I would like to give the final word to Professor Owczuk. So, thank you very much.

Prof. Radosław Owczuk: I really appreciate your involvement in our education, and I would like to appreciate our audience. We received a huge dose of knowledge, and I would like to say, it's a slogan but it's very important now, "Take care". Bye.

The webinar is initiated and organized by Mindray in the interest of the healthcare community to combat COVID-19. Thanks to the contribution of all the panelists who join in the discussion voluntarily with no conflict of interest.