

Prof. Bin Cao - Notes:

- [2:21]: **SARS-CoV-2**: genus, inactivated by UV and heat, 75% ethanol, chlorine-containing disinfectant, peracetic acid and chloroform. Chlorhexidine not effective.
- [4:00]: **Pathology**. Lung pathology closely mimics SARS and MERS infection – focal hemorrhage, exudates in alveolar cavities, alveolar damage, proliferation of type 2 pneumocytes, interstitial thrombosis. Pathologies in cardiomyocytes, spleen, renal glomerulus capillary, myelosuppression, liver injury.
- [7:30]: **Diagnosis** clinical and lab based – RT – PCR, Viral gene sequence, specific IgM and IgG
- [7:50]: **Confirmed case** = suspect case (epidemiological history + clinical symptoms)
- [8:19]: **Immune response**: IgM initially and declining slowly over 2 months, followed by rise of IgG titers
- [8:52]: **Transmission, incubation, disease spectrum**. $R_0 = 2.2 - 2.95$, Mean incubation period: 4 – 5.2 days. Transmission routes. Disease spectrum: 81% mild, 14% mild, 5% critical.
- [10:12]: **Clinical features and clinical course**. 45% still have cough on discharge. Mean duration of shedding was 20 days and as long as 37 days (could be more than 2 months – in publication)
- [12:40]: **Inflammation markers and progression**. Significantly increased D-Dimer $>1 \text{ ug/ml}$ and FDP – vascular endothelial damage, high ACE2 and clot formation, associated poor prognosis – indicates need for anticoagulation therapy. Viral sepsis – multiorgan failure.
- [14:48]: **Lab specimens** - Positivity rate was highest in lower respiratory tract specimens.
- [15:12]: **CT scan** – ground glass opacities initially but reticular and consolidation appears after 1 week of symptom onset, deterioration on CT are often very rapid.
- [16:35]: **Isolation and supportive treatment**. All confirmed patients – isolation. Suspected case – isolation in single room. Vital signs and biochemistry monitoring (LFT, RFT, myocardial enzyme, S. ferritin. IL-6, cytokine), oxygen therapy and supportive treatment very important
- [17:00]: **Treatment** - no specific antiviral. Lopinavir/Ritonavir – encouraging results (published NEJM). Remdesivir trials 1 (mild-moderate) and 2 (severe-critical) on-going, **Other treatments** – alpha-interferon, ribavirin, chloroquine, hydroxychloroquine, arbidol, convalescent plasma, favipiravir. **Corticosteroids** – low dosage, short term, for patients with rapid progressive deterioration oxygenation, radiology and excessive inflammation.
- [17:50 – 21:40]: For slides on **clinical trials**
- [22:55]: **Meplazumab** (monoclonal antibody, anti CD147) trial – pneumonia.
- [25:21]: **Tocilizumab** (anti-human IL-6R) trials
- [25:32]: **ARB/ACEi** – no definite answer so far
- [26:38]: **Discharge criteria**: Temperature normal for more than 3 days, improved respiratory symptoms, pulmonary imaging shows obvious absorption, two consecutive NAT test at least 24 hours apart

Prof. Bin Cao – Questions and Answers:

Q: Prone positioning during mechanical ventilation

A: Drainage of sputum especially with secondary bacterial infection but requires adequate staffing to perform correctly, not always possible in a busy ICU

Q: Given that antibody formation takes time, what is the value addition of AB testing for diagnosis

A: It has value: 1. Monitoring and prognosis, 2. Use in convalescence plasma

Q: Discharge criteria are more or less compatible with WHO criteria. Criteria that you use for following up of patients after discharging with 2 negative PCRs

A: All patients monitored after discharge. RNA positivity is common from oral cavity swabs – such cases admitted for another isolation period until RNA is negative.

Q: What is the criteria for HFNC?

A: Where 90% nasal flow cannot be maintained, HFNC is initiated. HFNC – risk of aerosolization – risk of contamination is possible. But with good PPE – N95, gloves etc it should be ok. If HFNC is not successful, should initiate mechanical ventilation quickly.

Q: What's about the antibodies treatment from recovery patients? Does it work?

A: There are 2 trials on-going in china, difficulty in randomization, do not have final results yet. However, safety seems good and may be a good choice for serious cases in resource limited settings.

Q: 45% had cough on discharge - do you not use fully resolution of respiratory symptoms for discharge?

A: We do not need that criteria. Almost half of patients still have cough on discharge.

Q: What about virus re-activation or re-infection after recovery?

A: No case of re-infection. If patients survive, protective antibodies exist.

Q: are there children with severe or critical condition and if yes, what was their treatment?

A: Few cases of COVID-19 in children in China. Even fewer cases are serious.

Dr. Liu Zheng - Notes:

- TJH one of the top ten hospitals in China, 5,613 in-hospital beds, 9,000 employees.
- [44:30]; TJH in COVID-19 outbreak 77,371m2 medical area opened up and constructed within 15 days, 2,205 beds opened, 3,310 TJH mobilized, 4,775 staff from outside Hubei, 3,338 admissions, 2,405 severe patients cure and discharged
- [45:20]: **Outline of presentation.**
- [45:30]: **Screening and triage:** 3 level fever screening; fever cases – fever clinic> CT, PCR, Antibody test > positive > mild (no pneumonia) - designated isolation area. If severe> designated hospital
- [47:46]: **Fever clinic** is a separate area – 3 zones and 2 channels, strict measures for nosocomial disinfection and protection levels

- [48:40]: **Admission procedure:** Fever with negative test/CT results admitted and isolated in buffer wards (single room) and PCR, antibody and CT scans repeated over 7 days. If negative> patient is transferred to normal ward area. If positive> transfer to designated hospital
- [51:36]: **Level of precautions:** Grade 1 – 3 in increasing order.
- [54:40] **Setting up of the wards:** infectious disease set up 3 zone, 2 channel, 50 bed per ward, 30 bed per ICU.
- [55:52] **Organization of isolation ward.** Channels and layout requirements (contaminated area, semi-contaminated area, sterile area) and buffer space, medical staff
- [57:06]: **Staffing.** All levels must be trained well – diagnosis, treatment, medical equipment and infection prevention. Shifts and regular rotation for nurses and doctors important. For doctors – 6-12 hour/day shifts, 2 weeks off every 2 weeks of work. Nurses – 4 hour/day shifts, 1 week off every 2-3 weeks of work. Multi-disciplinary clinical team. Centralized accommodation of medical staff and monitoring of health condition.
- [1:01:17]: **Medical equipment:** lists for care wards and ICU
- [1:02:24]: **Disinfection.** Equipment – air sterilizers, hydrogen peroxide sterilizer. NPV- exhaust fans with >12 exchanges per hour, PPEs
- [1:03:23]: **Quality control.** Designated medical affairs office to coordinate strictly with clear command and responsibilities.
- [1:04:36]: **Medical quality control.** 24-hour emergency response, severe pneumonia expert groups consultations, co-morbidities expert group, regular consultations 2times/week for multidisciplinary approach for critically ill patients.
- [1:06:38]: **Nosocomial infection.** Protection measures for 1. low risk exposure areas and 2. High risk exposure area– define exposure, departments involved and requirements.
- [1:09:18]: **Medical staff health** screening, reporting and management.

Dr. Liu Zheng - Questions & Answers

Q: Reliance on CT scans and not CXR

A: CT scan more accurate and sensitive, easily accessible in TJ hospital

Q: Multiple fever (temperature) checks at different points in the hospital

A: Unsure if one temperature check is sufficient, to be absolutely sure – temperature done at multiple levels. Maybe it is too much but at that the current time, this is a safest approach.

Q: Air sterilization – what methods

A: Hydrogen peroxidase air sterilizer most effective

Q: Designated COVID-19 hospitals

A: Only admission for COVID-19 patients, no other patients. TJH hospital has 3 campuses. Two (2) were designated for COVID-19 patients only.

Q: Why did doctors have a 2-week rest?

A: Doctors have 12-hour shift. Nurses have 4-hour shifts. Per day nurses work less hours than doctors. So, doctors have a longer rest period.

Q: How important is the traditional Chinese medicine?

A: Yes, some herbs used. Some trials done on effectiveness and found some efficiency.

Q: Do you use N95 for health workers other than those who are directly involved in aerosol generating procedures?

A: If they are not directly exposed to confirmed patients, no. Surgical mask used only in resource limited situation. In patients without fever, it is hard to determine who is infectious but if N95 is available, then it could be used. If not available, use surgical mask.

Q: Home isolation

A: Most patients living conditions cannot guarantee isolation from family members and they also may not be compliant to isolation measures at home. This was reflected in many household clusters of cases. So, home isolation was stopped, and many hotels and other facilities were opened up to accommodate mild symptomatic patients. This requires compliance and can be addressed through understanding of risks and consequences.

Q: During the early outbreak, when COVID-19 infection rate was not so high, how do you triage and separate those with COVID-19 infection from Non-COVID19 patients, especially elderly patients who are prone to infection, in terms of ED management?

A: In settings without access to RT-PCR for every patient, they had to rely on CT findings and correlate with clinical presentation. Even in absence of a negative RT-PCR test but very suggestive CT and clinical presentation, a case of COVID-19 is still diagnosed.

Q: Among health care workers that were infected, what was the main causes?

A: When investigated, most from COVID-19 patients in hospitals but as outbreak progress, more were infected from the community.

Q: What if a person with fever came to a non-COVID-19 hospital, what would happen to the patient?

A: Fever patient > RT PCR test positive > restrained in hospital > hospital manager will call a designated COVID hospital to pick up and transport patient.

Q: WHO has not approved air spraying for disinfection. Have you got any evidence on air spraying?

A: Not a lot of evidence. But in an outbreak situation, they do everything possible.

Q: Use of UV light for disinfection

A: It was used but effectiveness is not known and was not studied.

Q: Dealing with shortages of PPE and disinfectants

A: Very dangerous to have health care workers face shortages of PPE etc. TJH had a good stock of PPEs beforehand.

Q: If you have a patient with severe traumatic injury, unconscious or hypotensive. It is not possible to know if he is infected. How do you prepare the trauma team?

A: Prepare a single operation room separated from all other standard operation room. Such patients that cannot be confirmed COVID status, this separated operation room is used. Grade 3 PPE is used. Same precautions taken in the ER but using Grade 3 PPE.