



Recommendation and Consensus

Recommendations for prevention and management of COVID-19 in peritoneal dialysis patients

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Abstract

The World Health Organization characterized coronavirus disease (COVID-19) as a pandemic on March 11, 2020. Peritoneal dialysis patients have a weakened immune system that is associated with a high morbidity of infection. Thus, COVID-19 prevention measures and management for patients on peritoneal dialysis are urgent and critical. Based on published research on COVID-19 and previous clinical practices for similar coronavirus outbreaks, we aimed to make recommendations to manage patients undergoing peritoneal dialysis.

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Since December 2019, several cases of pneumonia due to an unknown agent were reported in China. After analyzing respiratory tract specimens, the etiologic agent was identified to be a novel coronavirus. The novel coronavirus and the disease it caused were named severe acute respiratory syndrome coronavirus (SARS-CoV-2) and coronavirus disease (COVID-19), respectively, by the World Health Organization (WHO).¹ COVID-19 rapidly spread to other countries worldwide. The WHO characterized COVID-19 as a

pandemic on March 11, 2020.² As of 18 March, 2020, there are 191127 confirmed cases and 7807 deaths globally, including 81116 confirmed infections with 3231 deaths in China.³

Currently, more than 369000 end-stage kidney disease patients receive peritoneal dialysis (PD). These patients account for 11% of the global dialysis population.⁴ As opposed to hemodialysis, PD is home based, and the patient is not required to travel to a hemodialysis center. Thus, PD may offer a higher degree of freedom and reduce the probability of nosocomial infection. In contrast, PD patients have a weakened immune system that is associated with a high morbidity of infection. If good education and management are not provided, it is more likely that patients on PD become close contacts even the infected persons. Thus, COVID-19 prevention measures and management for patients on PD are urgent and critical.

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Based on published research on COVID-19 and previous clinical practices for similar coronavirus outbreaks (e.g., severe acute respiratory syndrome), we aimed to make recommendations to manage patients undergoing PD.

Strengthen education

The staff at PD centers should increase awareness regarding the COVID-19 pandemic and essential preventive measures among patients and caregivers. This information should be conveyed clearly and repeatedly via television, WeChat, Facebook, Twitter and the Internet. Psychological problems, including anxiety and depression, are common among patients on PD.⁵ Thus, any myths or false information about the COVID-19 pandemic may deteriorate their psychological state. It is reported that fear can be more harmful than SARS-CoV-2 in controlling the COVID-19 pandemic.⁶ First, it is important to educate patients about the characteristics of SARS-CoV-2 and COVID-19. Currently, the natural host of SARS-CoV-2 remains unclear. Respiratory droplet transmission is the major route of SARS-CoV-2 spread, and it can be transmitted via direct contact with secretions and aerial droplets or via the fecal-oral route. Once SARS-CoV-2 invades the human body, it mainly affects the respiratory tract; however, the digestive tract, kidneys, and/or nervous system may also be involved. SARS-CoV-2 is sensitive to ultraviolet rays and heat and can be inactivated under conditions of a temperature of 56 °C for 30 minutes or by using 75% alcohol, a chlorine-containing disinfectant, and chloroform.

The incubation period of SARS-CoV-2 varies from 2 to 14 days (median 5 days). The clinical symptoms are diverse and range from asymptomatic to acute respiratory distress syndrome and multiorgan dysfunction. Typical symptoms include fever, cough, sore throat, headache, fatigue, myalgia, and breathlessness. Moreover, symptoms related to the digestive systems (e.g., nausea and diarrhea) and ophthalmic symptoms must not be ignored. Imaging manifestations vary with various factors such as the patients' age, immunity status, and disease stage at the time of imaging. The specific diagnosis for confirmed cases is a positive molecular test of respiratory samples. To date, there is no vaccine or effective antiviral medicine. Treatment is essentially supportive and based on symptoms. Individuals of all ages are susceptible. COVID-19 is a particular risk for older persons, particularly those with multimorbidity.⁷ In China, the overall case-fatality rate was 2.3%, and it was elevated

among individuals with preexisting comorbid conditions.⁸

Second, PD centers should provide patients and caregivers with instructions regarding hand hygiene, respiratory hygiene, cough etiquette, and social distancing. Instructions should include points on how to wear facemasks, how to use tissues to cover the nose and mouth when coughing or sneezing, how to dispose tissues and contaminated items in waste receptacles, how and when to use hand hygiene, and how to practice social distancing. Hand hygiene (i.e., hand washing or use of an alcohol-based hand rub) is performed especially after people have been in a public place or after blowing the nose, coughing, sneezing, or being in contact with secretions of people who might be infected. PD patients and caregivers are familiar with aseptic techniques as they are performed during and after PD procedures. However, following appropriate hand hygiene procedures should be emphasized on during this specific period. As the virus can remain viable and infectious in aerosols for hours and on surfaces for up to days, it is indicated that aerosol and fomite transmission of SARS-CoV-2 is plausible.⁹ Patients should be required to remain under home quarantine. The ventilation at home should be appropriate, with ample sunlight to allow for the destruction of the virus. Regular decontamination of rooms, surfaces, and equipment must be performed, and ultraviolet radiation must be preferably used. Social distancing measures dictate that patients should stay 6 feet away from each other. In addition, patients should be reminded to avoid crowded areas and postpone non-essential travel to places with ongoing transmission.

Triage and infection control

Triage and infection control for outpatients on PD

Patients who are stable and have no symptoms of a respiratory infection should be asked not to visit the hospital. Instead of patients themselves, relatives or caregivers are encouraged to visit outpatient departments to obtain new prescriptions for drugs, PD fluid, and iodophor caps. In addition, these individuals are encouraged to minimize the time they spend at outpatient departments. An individual must be separated by a distance of at least 6 feet from the nearest person (in all directions). In accordance with the local health care policy, physicians may increase the amount of single dispensing appropriately. Medicine and essential items for PD should be stored in sufficient reserves. The regular clinic follow-up should be

postponed. For patients with unstable conditions and those who are bedridden or living in remote areas, it is recommended to visit the nearest hospitals. The patients could also be monitored or interviewed via WeChat or over the phone if necessary. Automated PD (APD) is preferred if patients' economic condition permit. Remote monitoring in APD enables clinicians to access more accurate clinical data real time, thereby aiding in the earlier identification of clinical problems and the ability to adjust treatment approaches.¹⁰ In addition, patients at home could still receive continuous ambulatory PD (CAPD) if flowsheets can be faxed (or hand delivered every several day by caregivers) to the dialysis facility for review.

Before entering hospitals or outpatient facilities, the patients and any accompanying individuals should correctly wear masks, report their epidemiological history, and indicate whether they have symptoms of a respiratory infection.¹¹ In addition, they should be asked to practice cough hygiene by coughing in sleeves/tissues rather than hands, practice hand hygiene frequently,¹² and follow social distancing procedures while at the facility or hospital. The patients' temperature should be monitored by the medical staff. At the nephrology triage station, a nephrologist and PD nurse must further evaluate patients. Triage to the fever clinic is necessary when patients experience respiratory symptoms or are suspected of being infected with SARS-CoV-2. However, if the fever is found to be associated with PD, the nephrologist must be consulted further. If COVID-19 is excluded, the patient may return to the nephrology clinic or may be transferred to a ward if hospitalization is needed. Suspected COVID-19 cases should be referred to government-designated centers for isolation and testing.

Triage and infection control for inpatients on PD

Currently, all non-emergency patient admissions are suspended. In addition, non-emergency surgeries and operations are halted. Hospital visits should be reduced and avoided. A patient should be separated by a distance of at least 6 feet from the nearest individual (in all directions). If the patient needs care, there is a need for dedicated care by a designated person. Surfaces must be regularly decontaminated. In cases where PD centers have APD machines, the treatment of patients undergoing CAPD should be modified such that they may be treated on APD machines during hospitalization. This will reduce the number of connection times of the catheters and transfer sets and further avoid the possibility of contact infection.

Assessments should be conducted to exclude the presence of suspected or probable COVID-19 among patients and caregivers. Suspected patients should be referred to government-designated centers for isolation and testing. Any surface, supplies, or equipment located in wards housing suspected patients should be disinfected or discarded. Once COVID-19 is ruled out as the cause of the illness, the patient may return to the ward.

Isolation, reporting, and transfer of suspected patients must be conducted while adhering to local infection control policies and processes.¹³

Handling of suspected and confirmed patients on PD

If a suspected patient is confirmed as a positive case, he or she must be moved to special quarantine facilities for treatment. The treatment of suspected and confirmed COVID-19 patients is often provided by experts in respiratory and intensive care departments. Specialist diagnosis and treatment related to PD and its complications may be provided by nephrologists via the telephone, WeChat, or Internet. To minimize the risk of infection, it is recommended that the modality of CAPD is replaced with that of APD. Patients with mild conditions are encouraged to perform the procedure for PD by themselves. For critically ill cases, continuous renal replacement therapy is required as a replacement for PD.¹⁴

In summary, COVID-19 has posed a serious threat to global public health. It appears that this sudden epidemic is a battle that requires the involvement of every individual. It is critical that countries take urgent and aggressive steps to stop transmission, save lives, and minimize impact. As patients on PD have impaired immunity, they are susceptible to the infective pathogen. Based on the current knowledge about the virus, clinicians should provide practical assistance to patients on PD for the prevention and control of infection. We believe that we will be able to defeat the virus with everyone's effort.

Conflicts of interest

None.

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