

COVID-19 and End-stage Kidney Disease in Morocco: Staying Safe during Dialysis

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ABSTRACT

Since World Health Organization (WHO) declared a global Health Emergency at the end of January 2020 caused by the novel coronavirus 2019-nCoV, the rapid spread of this pandemic poses unprecedented challenges throughout the world.

Hemodialysis patients are more susceptible to SARS-CoV-2 pneumonia than the general population. Dialysis physicians, health workers should have clinical knowledge of epidemic COVID-19, epidemic prevention tools, and required guidelines.

This paper aims to focus on the Moroccan society of nephrology recommendations and the Ministry of Health guidelines to protect both healthcare workers and hemodialysis patients from the virus.

A package of measures has been recommended by the Ministry of Health to ensure continuity of health services for hemodialysis patients with Covid-19. Besides, the Moroccan society of nephrology recommendations has been adopted to ensure quality care for this vulnerable category throughout the epidemic.

Keywords: hemodialysis patients, end-stage kidney disease, renal failure, coronavirus, Morocco

INTRODUCTION

Since World Health Organization (WHO) declare a global Health Emergency on 30 January 2020 [1] caused by the novel coronavirus 2019-nCoV, the rapid spread of this pandemic poses unprecedented challenges throughout the world. SARS-CoV-2 virus is transmitted from person-to-person, either through inhalation or through deposition on mucosal surfaces of large respiratory droplets [2]. Although patients of all ages are susceptible to the disease, the patients with comorbid conditions have high mortality rates [3].

End-stage kidney disease is a severe medical condition with a high prevalence of comorbid conditions [4]. Hence, hemodialysis patients are more susceptible to SARS-CoV-2 pneumonia than the general population, worldwide, hemodialysis remains the prevalent dialysis modality for more than 2 million patients [5,6]. In Morocco, the diagnosis was confirmed by

the identification of the nucleic acid of the SARS-CoV-2 virus using real-time reverse transcription polymerase chain reaction (RT-PCR). Chest X-rays of patients with COVID-19 pneumonia were also used, showing consolidation and ground opacities, with bilateral, peripheral and lower lung distribution [7].

Covid-19 poses a high risk to hemodialysis patients because of their immunocompromised state, advanced age, and the coexistence of significant comorbidities including cardiovascular disease, diabetes mellitus, and others [8]. Thus, the management of dialysis patients affected by COVID-19 should be conducted according to strict protocols in order to minimize the risk to other patients and their caregivers [9].

In this regard, and in order to reduce the risks of contamination of haemodialysis patients and medical staff while preserving the functioning of haemodialysis centres, the Minister of Health, in collaboration with the

Moroccan Society of Nephrology, has established the following recommendations [10].

Gastrointestinal duplications are identified by the screening methods prenatally during pregnancy or in the first two years of life at a rate of 67-80% [1,3,4]. It may rarely be asymptomatic and may remain unattended until adulthood [3,4]. The case presented in our paper is a rare occurrence of duplication, which was diagnosed in an adult. Our case was diagnosed with a colonic duplication, which is particularly highlighted. Colonic duplications are reported in the literature with a rate of 7-13% among all duplications [4,5].

Measures Taken by Morocco Health Authorities to Ensure Continuity in the Delivery of Dialysis [7]

First of all, the health authorities have focused on increasing the capacity of haemodialysis centres by using the floors and/or rooms of other public and private sector organizations. Similarly, all health personnel must observe personal protective measures such as wearing a single-use gown, non-sterile single-use gloves, a respirator (mask) type FFP2, protective glasses during the exposure treatment; and hand hygiene by rubbing with a hydro-alcoholic solution as soon as the gloves are removed and also before leaving the room [11]. Once the center receives a case of Covid-19 for hemodialysis, all the activities must be stopped for 24 hours to disinfect the center under the required standards (Generators, soil, and surfaces).

Morocco health authority has also insisted on the collection of samples from personnel in close contact with hemodialysis patients with Covid-19 and its confinement. Moreover, a directive on the provision of personal protective equipment (PPE) to healthcare professionals, in sufficient quantities, to reduce any possible contamination and to ensure continuity of healthcare services for hemodialysis patients.

Recommendations of the Moroccan Nephrology Society [10]

In order to remain in harmony with the epidemiological situation characterized by the spread of Covid-19, Moroccan public health, as part of its health monitoring policy, has chosen to disseminate the recommendations of the Moroccan Society of Nephrology relating to the management of hemodialysis patients during the "Covid-19" epidemic. In this context, the main recommendations of the Moroccan Society of Nephrology are as follows:

Recommendation 1: Indications for extra-renal purification

Extra-renal purification should be used if there is a significant hydro-sodic surcharge not responding to diuretics, severe hyperkalemia (> 6.5 mmol/L), or electrical signs of hyperkalemia, severe metabolic acidosis ($\text{pH} < 7.1$), or acute renal failure stage 2 or 3 according to the KDIGO [12] classification since 24 hours, associated with sepsis in

the intensive care unit. A patient with IRA will require an ERP, when there is an acute reduction in Glomerular Filtration Flow and develops or risks the development of clinically significant hydroelectrolytic disorders or Uremic complications [7,10].

Recommendation 2: Extra-renal purification procedures

a) Continuous venovenous hemofiltration (CVVHF) at a dose > 25 ml/kg/h or high-volume venous hemofiltration (HVHF) at a dose ≥ 100 ml/kg/h may be the first-line treatment for COVID-19 positive patients in the intensive care unit.

b) In the absence of consumable equipment or expertise for continuous methods, intermittent hemodialysis will be used.

c) Cytokine purification methods: haemoperfusion (HP), haemoadsorption or plasma exchange is recommended to be used in the presence of a severe case of COVID-19. They are, in fact, indicated in cytokine storm syndrome, depending on the availability of the necessary equipment and the expertise of the teams. The hemodiafiltration may be performed for maintenance hemodialysis among patients with severe COVID-19, and the recommended treatment time is 6–8 hours every other day [13]. The tendency was a decrease in hemoperfusion (HP) Utilisation. This may be due to the change in drug profiles causing overdose. Improved Hemodialysis (HD) technique, with the use of new synthetic membranes, has resulted in drug elimination rates similar to those obtained by HP. The Hemoperfusion cannot correct the acid-base and electrolyte disorders associated with poisoning and can cause thrombocytopenia, leukopenia and hypocalcemia [14].

Plasma exchange helps to rid patients of all kinds of high, medium and low molecular weight toxins by separating and reducing them in the plasma. Therefore, plasma exchange may also be used in patients with COVID-19 to remove high molecular weight inflammatory mediators [15]. The Adsorptive modalities used for cytokine removal; start if IL 6 > 200 -500 pg/ml (reference in China) or > 1000 pg/ml (reference in Europe); IL6 monitoring is required.

Recommendation 3: Vascular route

a) Use a temporary bi-lumen catheter 12 to 14 F, 20 cm or longer in length.

b) Use the femoral route in COVID-19 positive patients in the intensive care unit.

Recommendation 4: Purification membranes

(a) If the hemodialysis water line is controlled, use high permeability or medium cut-off membranes.

(b) If the hemodialysis water circuit is uncertain, use low permeability membranes.

In summary, COVID-19 infection is an unusual threat to patients with end-stage renal disease. However, the impact of this pandemic on hemodialysis patients has not been

sufficiently studied. Therefore, the management of dialysis patients suspected of being in contact with COVID-19 should follow a strict protocol to minimize the risk to other patients and healthcare workers.

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