

Short Communication

# Particularities of COVID-19 infection in chronic hemodialysis patients in Sub-Saharan Africa: experience from Senegal (West Africa)

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## Abstract

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) appeared in December 2019 in China and has rapidly become a major global health concern. Patients with end-stage renal disease receiving dialysis treatment are very exposed to the SARS-CoV-2 during their frequent visits to healthcare facilities and immune induced by uremia. The aim of our work was to describe the particularity of COVID-19 infection in hemodialysis patients in sub-Saharan Africa and in Ziguinchor, south of Senegal, particularly. To do this, we conducted a monocentric prospective study over a period of 16 months at the Ziguinchor hemodialysis center and compared our results to a study that focuses on the seroprevalence of SARS-CoV-2 in chronic hemodialysis patients. We found a low prevalence of COVID-19 infection while the majority of our patients were in contact with the virus.

SARS-COV-2 is the virus responsible for coronavirus disease 2019 or COVID-19 (Corona Virus Disease 2019) which is a viral zoonosis responsible for the pandemic that began in December 2019 in the city of Wuhan in central China. It is a highly contagious infection with human-to-human transmission [1].

Hemodialysis patients are indeed particularly exposed to COVID-19 infection, due to certain constraints such as their hospital contacts at each hemodialysis session, the need to travel three times a week to their hemodialysis center and the promiscuity which exists in hospital premises [2]. To this, is added their state of immunosuppression induced by uremia. Moreover, available data have identified them as among the groups most at risk of severe cases and death when contracting COVID-19 [3].

The prevalence of COVID-19 infection in chronic hemodialysis patients was very low in sub-Saharan Africa during the pandemic despite the very high risks of

contamination. We carried out a study in Ziguinchor, south of Senegal, at the hemodialysis unit of the Regional Hospital Center of Ziguinchor during the period from April 1<sup>st</sup>, 2020 to August 31<sup>st</sup>, 2021. The aim of this study was to determine the prevalence of COVID-19 infection in chronic hemodialysis patients in Ziguinchor. Included in our study, are all chronic renal failure patients who are regularly on hemodialysis for at least 03 months and presenting symptoms of COVID-19 with a positive RT-PCR test and/or scenographic signs in favor.

The prevalence was 0.18% in chronic hemodialysis patients, while another previous study published on BMC Nephrology carried out in 2020, on the prevalence of serological markers for SARS-CoV-2, found a seroprevalence of 21.1%. About 95.33% of them had IgG antibodies [4]. The very low prevalence in our patients could be explained, on the one hand, by a majority of asymptomatic cases which were not diagnosed because their asymptomatic condition, did not benefit from the COVID test, and on the other hand,

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the African populations could develop a response from slightly different immune system against the virus modulated by multiple interactions with environmental factors and pathogens [5].

These 2 studies allowed us to conclude that the majority of our patients in sub-Saharan Africa on chronic hemodialysis during the COVID-19 pandemic were in contact with the virus but did not develop the disease.

The mortality rate in our chronic hemodialysis patients related to COVID-19 infection was less than 1%. Data from other continents report a mortality rate of between 20% and 32.8% in hemodialysis patients with COVID-19 [6,7]. The younger age of our cohort could be the main determinant of the lower number of deaths.

Albalade M and al reported lymphopenia in almost half of the dialysis patients with confirmed COVID-19 [8]. Various hematological features have been reported in patients with COVID-19, but hyperleukocytosis, lymphopenia, and thrombocytopenia might be correlated with disease severity [9]. The lack of such hematological disturbances in our studies in Senegal is consistent with the low rates of morbidity and mortality related to COVID-19 observed in our patients who rarely had severe forms of the disease.

In conclusion, our studies showed that despite a high seroprevalence of SARS-CoV-2 antibodies, the majority of African hemodialysis patients had asymptomatic disease. Moreover, COVID-19 has been associated with a low rate of hospitalization and mortality in chronic hemodialysis patients. However, the early implementation of national guidelines for the prevention and control of COVID-19 cases in dialysis centers may have reduced the risk of center infections among patients and health workers.

Our study has some limitations. First, the small sample size, however, a multicenter study on the prevalence of COVID-19 infection in chronic hemodialysis patients in Senegal is planned and nationwide. Then the collection of clinical symptoms and the routine biological analysis could induce a certain recall bias when the information was not recorded in the patient's medical record. Moreover, we lacked certain socio-demographic parameters such as employment status, income level, living space, household size, and type

of transport from home to the dialysis center that could influence the contamination risk of the patient. However, current results in this subgroup of dialysis patients may not reflect true estimates in the general population.

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