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EDITORIAL

Impact of the COVID-19 pandemic on the nephrology activity of hemodialysis started in an emergency context: a view from Morocco

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During the months of confinement following the sudden and general onset of the COVID-19 pandemic, hospital activities on a world scale were oriented almost exclusively to the care of COVID-19 patients, with a very marked reduction of non-COVID-19 activities. The data published today on the impact of the pandemic on nephrology activities mainly concern kidney transplantation, as we lack data on acute hemodialysis, a major part of nephrology activities in many countries [1, 2]. In Morocco, a developing country located in the extreme northwest of Africa, with an estimated population of 37 million, the prevalence and incidence of end stage kidney disease (ESKD) are relatively high and consequently, the activity of emergency initiation of hemodialysis for patients presenting unknown or known ESKD is a major nephrology activity [3, 4]. The number of patients with ESKD on hemodialysis is also significant in our country and is estimated at more than 32,000. In Morocco, general confinement began on March 16th and ended on June 10th. This was followed by a period of gradual return to hospital activities during June and July, and since early August, we have been seeing a true second wave, with an average of 2500–4000 new cases per day. As of today, November 1st, 2020, there are 219,084 registered cases, of which more than 90% have been recorded since August 1st, 2020 [5]. The total number of cases in the eastern region, in the northeast of Morocco with approximately two million inhabitants, is 12,270. Currently, it is the sixth most affected among the 12 regions of the country, whereas it was the least affected region at the start of the pandemic. The Unit of Nephrology-Dialysis-Kidney Transplantation of the Mohammed VI University Center of Oujda began its hemodialysis activities in April 2016 and is the only university nephrology center of the eastern region to perform emergency dialysis for all patients of the region, with permanent on-call medical service 7 days a week, 24 h a day. These emergency hemodialysis sessions mainly concern patients with severe ESKD, often unknown and not yet under dialysis, and less frequently ESKD under dialysis, or severe acute kidney failure. The major indications of these sessions remain acute pulmonary edema and/or severe electrolyte disorders (hyperkalemia, hyponatremia, and acidosis), and/or uremic syndrome (digestive or neurological). Dialysis activity was considerably reduced during the periods of confinement and immediately post-confinement, with the resumption of full activity starting in late June 2020. What really happened during that period?

To determine the impact of the COVID-19 pandemic on acute hemodialysis activities, we collected data on the number of emergency hemodialysis sessions performed, and the number of patients hospitalized who benefited from these sessions from January to October of the 3 years 2018, 2019, and 2020. We observed that the number of hemodialysis sessions was considerably reduced, by 75%, even 85%, for the 2 months of April and May 2020 compared to the year 2019. Only 16 sessions were performed in April 2020 versus 135 in April 2019. Figure 1 shows the evolution of the total number of emergency hemodialysis sessions performed between January and October in the 3 years 2018, 2019, and 2020. After this considerable reduction of activity, we expected a greater resumption of these activities with a "retrieval" of patients from July to October, but activity remained similar or even lower compared to the same months of the two preceding years. Nor was the number of new cases affected: 36 "new case" patients were placed on emergency hemodialysis in August 2019 versus 32 in August 2020, 43 in September 2019 vs. 40 in September 2020, and 40 in October 2019 vs. 51 in October 2020. Fourteen% of new patients in October 2020 were COVID-19-positive. Figure 2 shows

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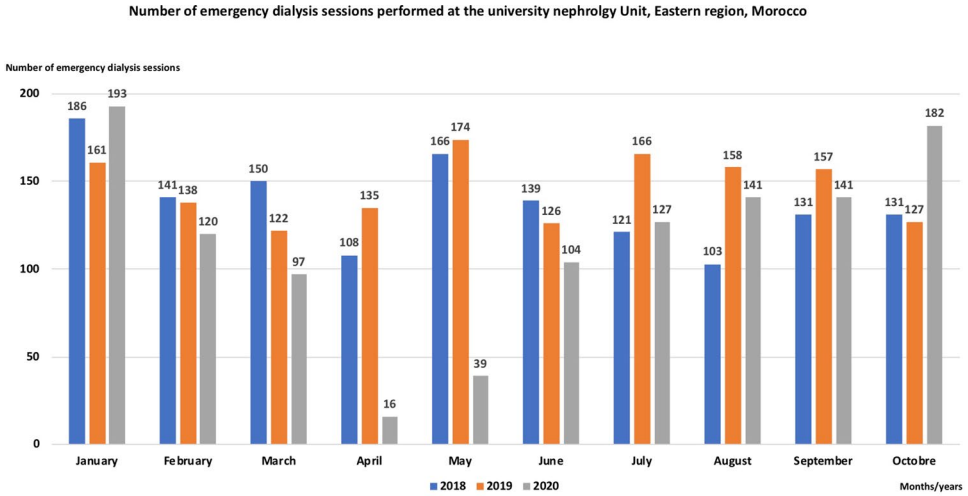

Fig. 1 Evolution of the total number of emergency hemodialysis sessions performed between January and October in the three years 2018, 2019, and 2020

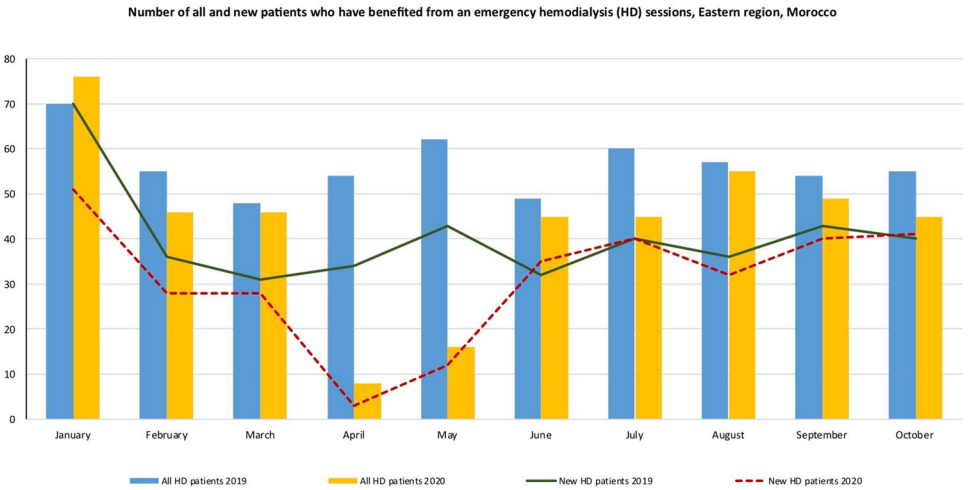

Fig. 2 Evolution of the total number and new hemodialysis patients admitted for emergency hemodialysis treatment between January and October in the two years 2019 and 2020

the evolution of the total number (including new hemodialysis patients and those already followed in the nephrology department) and new hemodialysis patients admitted for emergency hemodialysis treatment between January and October in the years 2019 and 2020. How can we explain this observation? First, some patients were placed on emergency hemodialysis in the critical care units and were treated jointly by nephrologists and intensivists. However, these dialyses represent less than 10% of the dialyses performed monthly in nephrology. Second, all the non-university hospitals of the region organized their departments to ensure emergency hemodialysis during the day. Third, patients on dialysis or not yet on dialysis, being afraid of contamination by SARS-Cov-2 during hospital visits, respected their regimen, and complied better with their treatment and follow-up. Fourth, telehealth visits were provided to most patients by department doctors, mainly by telephone, and contributed to maintaining good medical follow-up possibly preventing the development of acute complications. Fifth, deaths probably occurred at home, especially sudden deaths due to hyperkalemia, cerebral vascular accidents, or uremic syndrome. The percentage of deceased patients is still unknown and is very difficult to determine it in the current conditions. Finally, the reduction of emergency hemodialysis activity did not have a major short-term impact on global hemodialysis activities, but the long-term repercussions will only be determined in a few months. As the second wave is still increasingly strong in our region, the long-term consequences for patients with chronic kidney disease, in terms of progression to ESKD or death, could be greater than expected. The figures for the month of October are higher than those for the same month of preceding years and for the preceding months of the same year. Most likely, this is due to the retrieval of ESKD patients, but also to the arrival of new COVID-19-positive patients. The next months will bring us very valuable data allowing us to better understand the situation. There has been a marked increase in the number of new cases in the region, and our structure

is currently treating a high number of COVID-19-positive patients, more than ten times higher than at the start of the pandemic. Despite this significant increase we have maintained all of our acute hemodialysis activities during this second wave by developing ways of adapting. Thus, we have established four acute hemodialysis units vs. two units pre-pandemic, with two under the Critical Care Department (one for COVID-19 patients and the other for non-COVID-19 patients), and two under the Nephrology Department (one for COVID-19 patients and the other for non-COVID-19 patients). Screening for SARS-Cov-2 is also provided for every COVID-19-suspected hospitalized patient, and a well-defined circuit has been established for both suspected and confirmed patients. Our hospital regularly engages in reorganization and readjustments as needed to ensure the care of more COVID-19-positive patients and to maintain a maximum of emergency non-COVID-19 activities. Otherwise, the transmission of the virus is currently community-based, and the risk of being contaminated by SARS-Cov-2 is felt to be higher outside the hospital. However, the contamination of medical and paramedical personnel and their exhaustion, as well as the explosion of the number of new cases combine to exacerbate the crisis and put our health system under intense pressure. In summary, hemodialysis activities have been maintained, despite the current strong wave, thanks to better organization of health structures at the local, provincial, and regional levels. Nevertheless, we are not shielded from an evolution toward a catastrophic scenario that would oblige us to redefine health priorities and completely modify our strategy in dialysis, and not only. One thing is certain, however the epidemiologic situation evolves, we shall do our best to maintain maximum levels of emergency hemodialysis activities for both the COVID-19 and non-COVID-19 circuits.

Compliance with ethical standards

Conflict of interest The author reports no conflicts of interest.

Ethical approval Committee approval and informed consent were not needed because the study was observational and retrospective. The study was conducted with absolute respect for international ethics standards (anonymity and data protection).

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