Acute kidney injury in patients with influenza A (H1N1)

In early 2009, an epidemic caused by a new influenza A virus of swine flu (H1N1) was detected in Mexico.[1] Subsequent cases were detected worldwide, and in June 2009 the World Health Organization issued a maximum alert to the occurrence of a pandemic. This year, there were more than 17,000 deaths related to this infection.[1,2] In Brazil, in the period from January 1st 2012 to July 21st 2012, there were 11,232 cases of Severe Acute Respiratory Syndrome causing hospitalizations; 2,347 of them by the post-pandemic H1N1 virus (75% of influenza cases), with 860 deaths.[3] Characteristically, the most severely ill patients infected with H1N1 have pulmonary involvement, respiratory failure and hemodynamic instability. Some patients may develop multiple organ failure - related to systemic inflammatory response, hypoxia, and bacterial sepsis, although a direct cytopathic effect of the virus is not to be ruled out.[4,5]

There are but a few studies which have analyzed the extrapulmonary involvement in patients suffering from this infection, especially acute kidney injury (AKI).[5-9] AKI is more frequent in patients with severe H1N1, with an incidence of around 50-60%, being associated with hemodynamic instability, advanced age, obesity, diabetes mellitus, rhabdomyolysis and chronic kidney disease.[6-8] In Brazilian renal transplant patients, the incidence of acute kidney dysfunction is reported to be of 58%.[10] Studies have shown the presence of the H1N1 virus in urine and in kidney cells of patients with the infection; however, these findings could not be directly related to a kidney injury caused by the virus.[11,12]

Many patients develop a severe form of AKF, defined as the RIFLE criteria of for Kidney Injury and Failure, requiring dialysis in up to a quarter of the patients.[6,7] The AKI, along with the need for mechanical ventilation, hypotension requiring vasoactive drugs and metabolic acidosis is a factor associated with an increased risk of mortality.[1,7-9] Among the survivors, there are case reports of patients who did not fully recover their kidney function, months after hospital discharge.[7]

In this issue of the Brazilian Journal of Nephrology, Sevignani *et al.* describe the kidney histopathological findings of patients demonstrably infected by H1N1 and with AKF, correlating them with the clinical aspects of the cases.[13] Although there are national publications addressing the topic, it becomes important to analyze the histological aspects of the kidneys from H1N1-infected patients with AKI. The cases studied exhibited clinical and/or laboratorial data of AKI and only one did not have oliguria. In renal histology, all patients studied had varying degrees of tubular changes and there were no evident signs of acute tubular necrosis, and there seems to be a prerenal component as the main cause of AKI in these patients, associated with other factors such as prolonged systemic hypoxia, rhabdomyolysis and severe inflammatory response.

Given the constant epidemics of H1A1-associated influenza A, it is important to monitor the kidney function of the most severely ill patients, instituting therapeutic measures of renal protection. There is a need for better understanding the mechanisms involved in the pathogenesis of acute kidney dysfunction that affects these patients. Finally, as with other patients who survive the AKI, attention should be paid to long-term monitoring of renal function in these patients.

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