Transient Fanconi Syndrome in a Child with Acute COVID-19 Infection

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A 5-y-old female with COVID-19 infection, presented in shock with nonanion gap metabolic acidosis, polyuria, very low bicarbonate, potassium and phosphate, non-nephrotic range proteinuria, glucosuria, elevated beta-2 microglobulin in urine, and urinary phosphate loss, confirming the diagnosis of proximal renal tubular acidosis. She required aggressive fluid, bicarbonate, potassium, and phosphorus correction. There was a gradual decrease in urine output and improvement in the acidosis and electrolyte abnormalities. She had normal parameters on follow-up.

COVID-19 infection with renal involvement has been documented in several adult case series. A study from Wuhan documented proteinuria, hematuria, and azotemia in 44%, 27%, and 14% respectively [1]. Transient renal tubulopathy presenting as nephrogenic DI or transient Fanconi syndrome have also been reported [2].

Renal histopathological findings of 26 patients with COVID-19 by light microscopy revealed tubular damage with loss of brush border, vacuolar degeneration, and dilatation of tubule lumen with cellular debris, possibly due to direct viral invasion. Electron microscopy revealed coronavirus-like particles in the proximal tubular cells, podocytes, and distal tubular cells. ACE2 is expressed in the apical brush border cells in the proximal tubule and in podocytes, and the presence of virus-like particles correlates with this distribution of the ACE2 receptors [3]. These histopathological findings clinically present as transient function loss

of the proximal tubular channels, manifesting as Fanconi syndrome. A study in France, found proximal tubulopathy in 68%, proteinuria in 85%, phosphate leakage in 48%, and glycosuria in 44% [4]. This is commonly self-limiting, with resolution of derangements on recovery, although more profound injuries could present as acute tubular necrosis and acute kidney injury.

COVID-19-induced Fanconi syndrome, although reported in adults, has not yet been described in children. The incidence, manifestations, and long-term effects of renal issues amongst children with COVID-19 merits further attention

Declarations

Conflict of Interest None.

References

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