

# Nephrotic Syndrome a Rare Manifestation of COVID-19, a Case Report

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## Abstract

One of the symptoms of glomerular damage is proteinuria and nephrotic syndrome, which can be primary or secondary. Secondary nephrotic syndrome is followed by systemic diseases, malignancies, drugs, and a variety of infectious diseases. In the recent Coronavirus disease 2019 pandemic, a wide range of organ involvement has been reported, including, kidneys, cardiovascular, endocrine, and nervous systems, mostly in adults and less reported in children. Our patient was an 11-year-old child with COVID-19 who presented with diabetic ketoacidosis and developed proteinuria, nephrotic syndrome, and renal failure during the course of the disease and mild respiratory symptoms appeared at the end of the illness.

**Keywords:** COVID-19; Corona virus disease 2019; Nephrotic Syndrome; Child.

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## Introduction

Proteinuria and nephrotic syndrome indicate severe damage to the kidney glomeruli.

Nephrotic syndrome manifests as severe proteinuria (urinary protein greater than 40 mg / h / m<sup>2</sup>) with edema, hypercholesterolemia, and hypoalbuminemia. Its incidence is about 1-3 cases per 100,000 children under the age of 16 and it is more common in boys than girls. Nephrotic syndrome in children can be primary or secondary to systemic diseases (SLE and HSP), drugs, and malignancies (Leukemia, lymphoma) and infections (hepatitis, HIV, infectious mononucleosis and toxoplasmosis) (1-4).

Recently, with the spread of coronavirus infection, cases of glomerular damage have been reported, with very variable manifestations.

## Case Report

The patient was an 11years old obese girl in sanandaj, Iran, who had been suffering from weakness and lethargy and rapid breathing for two days before the visit. She had no history of previous

illness. At the initial physical exam, nothing was found except lethargy, drowsiness, and tachypnea. Respiratory rate was 40/min, pulse rate: 110/min, blood pressure:110/80 mmHg and body weight: 50 kg.

In the initial tests at admission time blood sugar was reported as 450 mg/dl, BUN:20 mg/dl, creatinine: 0.7 mg/dl, Na:135 mEq/l, K: 3.5 mEq/l and complete blood count were in normal range. In blood gas: PH: 7.08, Pa CO<sub>2</sub>:15, PaO<sub>2</sub>:80, Hco<sub>3</sub>:5 mEq/L and O<sub>2</sub> saturation:96%.

Urinalysis showed as follow: ketone 2+, Sugar: 3+, WBC: 2-3, RBC: 3-4 and negative protein.

The patient was admitted to the intensive care unit with an initial diagnosis of diabetic ketoacidosis and treatment was started according to the diabetic ketoacidosis protocol. Despite Proper and accurate treatment, blood sugar remained high after 48 hours and patient's acidosis did not improve. During this time, urine volume, and other lab tests were normal. On the third day, the patient's level of consciousness decreased and the respiratory distress increased,

blood pressure increased and the volume of urine decreased. Therefore, with the possibility of cerebral edema, CT scan of the brain was performed, which was normal. However, according to neurologist consult, infusion of Mannitol and furosemide were begun.

Due to the increased tachypnea, CT scan of the lung was done, mild pulmonary infiltration was reported in favor of pulmonary edema and viral pneumonia.

At this time, the results of new lab tests were:

Amylase:1055, ALT:77, AST:207, CPK:290, LDH:570, Alb:2.3, Uric Acid:2, TG:95, Cholesterol:240, BUN: 60, Cr: 3.5, Na:130, K:5.5, Hb: 8.5, blood WBC:1100 (L:10 N:85), Plt: 210000, PBS: normal, INR:1, ESR: 19, CRP: 2+, negative blood culture and urine culture, U/A: Protein: 3+ WBC: 10-15, RBC: 10-15, Upr/cr: 3.

Abdominal sonography and echocardiography were normal and COVID-19 PCR was negative.

Depending on the patient's condition and lab data, captopril and then Amlodipine were added to the patient's medication, and daily albumin infusion, bicarbonate infusion, and packed cell infusion, were performed.

With the supportive measures and relative adjustment of blood sugar and blood pressure, the patient's alertness gradually improved, but acidosis and tachypnea continued and on day 7, the patient became anuric.

Due to treatment-resistant acidosis, increased urea and creatinine, and anuria, hemodialysis (By observing protective measures) was started at 1 hour per day and gradually increased. After three days, the flow of urine began, and in the following days the patient's proteinuria and hematuria decreased, and serum albumin levels increased. After a total of six periods, dialysis was discontinued.

On day 12, despite clinical and laboratory improvement, the patient developed single dry coughs without fever. Lung CT scan was performed again, and increased involvement was seen in favor of coronavirus, and result of new PCR test was positive. The patient was transferred to the Corona ward and treated with hydroxychloroquine.

After a week, the patient was discharged from hospital with well general condition and normal tests.

## Discussion

The coronavirus has been causing common colds in humans since time immemorial. Recently, two

groups of these viruses have caused deadly epidemics in the world, known as SARS and MERS. Recently, a new form of Corona virus has emerged that has quickly spread around the world, leading to a pandemic called Coronavirus disease 2019 (Covid-19). Coronavirus 2019 is more likely to be an acute respiratory syndrome. However, sometimes Covid-19 can affect other organs, such as the gastrointestinal tract, kidneys, nervous system, and endocrine system, making it difficult to diagnose and treatment (5-7).

In our patient, the onset of symptoms was ketoacidosis, followed by symptoms of involvement of other organs, especially the kidneys, in the form of proteinuria, hypoalbuminemia, hyperlipidemia, and mild edema, followed by hematuria, hypertension, and renal failure and mild respiratory symptoms were a late finding.

In a study conducted by Wang et al in Wuhan, China, 116 hospitalized patients were examined for kidney failure due to Covid-19. About 10.8% of patients had a slight increase in urea and creatinine and about 7.2% had mild proteinuria. None of them showed signs of renal failure, and it was concluded that renal involvement in coronavirus was mild and minor (8).

In another study by Cheng et al on 701 patients in China, 43.9% of patients had proteinuria and 26.7% had hematuria. About 14% of patients had an increase in urea and creatinine, and 5% of patients had renal failure, and it was concluded that the rate of kidney involvement in hospitalized patients was high, which increased mortality in patients (9).

## Conclusion

Covid-19 is often an acute respiratory syndrome, but sometimes manifests as multiple organ involvement, one of which is Kidneys, which can range from a microscopic hematuria to severe proteinuria and nephrotic syndrome and even AKI.

## Conflict of Interest

The authors declare no conflicts of interest.

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## References

1. Avner E, Harmon W, Niaudet P, et al, pediatric nephrology (7th edition), springer. 2016; 838-881.

2. Kliegman RM, Stanton B, Geme JS, Schor NF, et al. Nelson textbook of Pediatrics. 21th edition, Elsevier, 2020; 2752-57.
3. Eskandarifar A, Fotoohi A, Mojtahedi Y. Nutrition in Pediatric Nephrotic Syndrome. J Ped. Nephrology 2017;5(3).
4. Moradveisi B, Rashidi A, Alavi S, Eskandarifar A, Clin Kidney J (2014) 7: 424–425.
5. Naicker S, Yang C, Hwang S, Liu B, et al. The Novel Coronavirus 2019 epidemic and kidneys, Kidney International (2020), article in press.
6. Valizadeh R, Baradaran A, Mirzazadeh A, Bhaskar LVKS. Coronavirus-nephropathy; renal involvement in COVID-19. J Renal Inj Prev. 2020; 9(2): e18.
7. Fanelli V, Fiorentino M, Cantaluppi V, Gesualdo L, et al, Acute kidney injury in SARS-CoV-2 infected Patients, Critical Care (2020) 24:155.
8. Wang L, Li X, Chen H, Yan S, et al, Coronavirus Disease 19 Infection Does Not Result in Acute Kidney Injury: An Analysis of 116 Hospitalized Patients from Wuhan, China, Am J Nephrol, Published online: March 31, 2020.
9. Cheng Y, Luo R, Wang K, Zhang M, et al, Kidney Int.,Elsevier, 2020 May; 97(5): 829–838.