COVID-19 in Single Kidney Patient

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Abstract- The COVID-19 pandemic has affected all people in the world, especially those at risk of kidney disorders. Early kidney damage in patients born with unilateral renal agenesis (URA) or solitary kidney can happen. These patients are at risk of chronic kidney disease (CKD), high blood pressure, and developing proteinuria. Unilateral renal agenesis is a cause of CKD. Therefore, it is very interesting that observe a unilateral renal Patient that Suffers from COVID-19. Hence, the management of these patients with COVID- 19 is an area of interest, and a unique approach is warranted. A 43-year-old male patient with unilateral renal presented to our hospital for corona disease. The case was discussed between the nephrologists, Infectious disease specialists, and nursing head nurses for a care plan daily. The patient had unilateral renal disease, and COVID-19 could have a detrimental effect on the renal, but renal tests were normal, and the patient recovered without acute renal complications. The treatment of such patients is the need for teamwork contain nephrologists, critical care nurses, and specialists in infectious and tropical diseases. This was a new experience in Iran.

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Introduction

Solitary kidney or unilateral renal agenesis kidney is a common disease (1/720 births) with a predominance of male patients. This disorder often occurs in the left kidney. Its etiology and pathogenesis are unknown; they may have genetic or environmental roots. Some researchers consider it a syndrome (1). These patients are at higher risk of developing proteinuria, chronic kidney disease (CKD), and/or high blood pressure (2-4).

The coronavirus 2019 (COVID-19) pandemic affected all people, especially at-risk populations, such as kidney disorders. Although the most important symptoms of the disease can be seen in the respiratory system, the virus also affects other organs (5). Researches reveal that the prevalence of renal disease on admission during hospitalization in patients with COVID-19 is high and is associated with in-hospital mortality. In a study in Jahrom city, south of Iran, 15.8% of hospitalized patients with COVID-19 had history of kidney disease (6). Hence, clinicians must increase their awareness of the renal disease in patients with severe COVID-19 (7).

Since information on kidney disease in patients with COVID-19 is limited, in this article, we describe our experience with URA patient that suffers from COVID-19, which treat by collaboration between a multidisciplinary team.

Case Report

A 43-year-old man (BMI:26 Kg/m^2) presented to our hospital for the treatment of respiratory distress syndrome, and his Symptoms were Headache, Fever, Sweating, Dyspnea, Nonproductive cough, Fatigue, and Myalgia. He was admitted to the infectious diseases ward, and He identified as a high-risk patient then isolated. The swab Polymerase Chain Reaction (PCR) test from a patient's oropharynx was positive for COVID-19. The final diagnosis was COVID-19. He was admitted to the infectious diseases ward of Peymanieh Hospital of Jahrom University of medical sciences on 2020/05/11 at 13:50.

The patient's history was mild dyspnea and unilateral renal agenesis (URA). He had not any history of

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medication, DM, or hypertension. He reports an epidemiological history of occupational travel in Bandar Abas (south town of Iran with a high prevalence of COVID-19). His job was the army.

On clinical examination on the first day, fever: 39.3° C, heart rate: 88/min, blood pressure; 145/85 mm Hg, respiratory rate: 29/min, Saturation of Peripheral Oxygen: Spo2:86%. Chest X-ray shows pneumonia in the right lower lobe.

His laboratory workup included: WBC :3500 LCM, PLT:110 x103/mm3, Hb:14 mg/dl, BUN:16 mg/dl, Cr:1.1 mg/dl, CRP:45 Mg/L, ESR:35, AST:35 U/L, ALT:30 U/L, amylase:54 U/L (Table 1).

Table 1. Clinical and Lab tests in the unilateral patient who suffer from COVID-19

	First day	Third day	Seven day
WBC 103/Mic	9.5	8.9	7.6
PLT 103/Mic	110	100	110
Hb g/dl	14	13	13
FBS	105	89	91
Cr mg/dl	1.1	.9	.7
BUN mg/dl	16	14	10
Specific gravity	1031	1022	1018
GFR	85	84	85
Protein urea	negative	negative	negative
Na mEq/L	139	134	135
K mEq/L	5	4.5	4.5
CRP Mg/L	45	10	7
ESR mm/hr	35	24	10
AST U/L	35.0	-	-
ALT U/L	30.0	-	-
amylase U/L	54.0	-	-
O2 saturation	86%	90%	95%
T °C	39.3	38.9	37.3
PR/min	88	88	73
RR/min	29	25	16
BP mmHg	145/85	125/80	125/70

Spiral CT scan of chest and mediastinum (Without IV contrast) showed: Multiple bilateral patches of ground-glass opacities, and consolidation is seen located in peripheral and peri bronco vascular areas compatible with Covid-19 pneumonia (Figure 1, 3, 4). Moreover, Sub segmental atelectasis is seen in the posterior basilar segment right lower lobe And Several mediastina lymph nodes (Figure 2).

Abdominal Ultrasound imaging revealed crossed ectopic of both kidneys is seen located on the left side of the abdomen measuring about 125 mm and 91 mm. Minimal stasis is seen in a superior located kidney.

The case was discussed between the Infectious disease specialist, nephrologists, and nurse staff, and the decision was made to Implementation of Guidelines Panel treatment protocol for patients with COVID-19, daily examination of nephrologist with Infectious disease specialist together and daily nursing care plan.

Treatment started with hydroxychloroquine 200 mg BID PO, oseltamivir 75 mg BID PO. After seven days, the patient's symptoms improved relatively. Three days before discharge, the patient was afebrile, respiratory symptoms significantly improved, and improvement CT.

The patient was discharged after seven days in good condition, laboratory data on discharge day was normal (BUN, Cr, and PCR). The treatment plan of COVID-19 was 14 days quarantine at home and use.

Treatment plan contains hydroxychloroquine 200 mg BID PO, Oseltamovir 75 mg BID PO, Apotel one gram IV PRN (as needed), Oxygen 100% 6-10 liter by mask intermittent, daily assess for Symptoms of drug poisoning, daily check of FBS, BUN, Cr, U/A, BP, low salt and high fiber diet, patiently educated for discharge plan.

For the follow-up, the patient was visited 15-day later, discharged with a nephrologist and Infectious disease specialist together, then referred to the nursing educator supervisor for the evaluation nursing process.

The patient has not experienced any episodes of ATN in these 22 days. Additionally, did not complain from any problem of kidney disease in telephone follow-up by nurses, three months later.

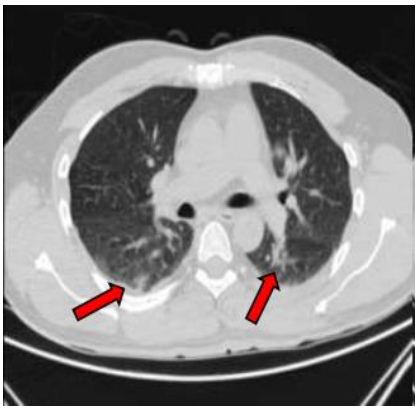

Figure 1. Consolidations in lower lobe of Rt and Lt lung

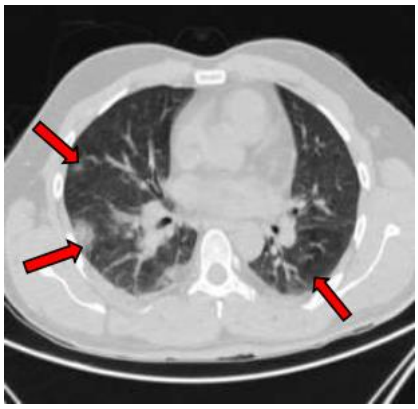

Figure 2. Peripheral/sub pleural distribution

Figure 3. Ground glass opacities in lower lobe of Rt and Lt lung

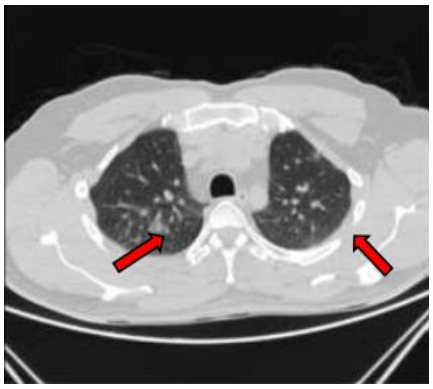

Figure 4. Ground glass opacities in upper lobe of Rt and Lt lung

Discussion

Coronavirus Disease 2019 with a mortality rate of 1%-6% in the general population (8). Reports show that AKI is a common complication of severe coronavirus disease in 2019 in hospitalized patients. Studies have also observed proteinuria and microscopic hematuria in such patients (9). Organ dysfunction (shock, acute respiratory distress syndrome [ARDS], acute cardiac injury, acute kidney injury), and death can occur in cases of COVID-19 (10), but in this case, according to preventing medical care, we don't have any symptom of Organ dysfunction. In the study of Yichun Cheng *et al*., 43.9% of patients had proteinuria, and 26.7% had hematuria. Kaplan-Meier's research revealed that patients with renal disease had a significantly higher risk of in-hospital death. The prevalence of elevated serum Cr was 14.4%, elevated serum BUN was 13.1%, and estimated GF under 60 ml/min/1.73m2 was and 13.1%. This research showed AKI occurred in 5.1% of patients. They revealed that the prevalence of renal disease on admission during hospitalization in patients with COVID-19 is high and is associated with in-hospital mortality (9). Although renal side effects have not been reported for oseltamivir and hydroxychloroquine, these drugs have a relative contraindication in the case of renal impairment (10-12). Therefore, the nurse's team checked all kidney laboratory tests daily and monitored the patients in all shifts carefully.

Such as our patient, ground-glass opacities, and consolidation in the lung periphery has been the imaging hallmark in patients with COVID-19 infection (13).

People who have unilateral renal disorders are at risk for CKD. Some patients in Covid-19 report kidney diseases. In this case, renal function was normal, and the patient recovered without acute renal complications. The most important thing, in this case, we're doing teamwork between specialists and constant monitoring, even after patient discharge.

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References

1. Saran R, Robinson B, Abbott KC, Agodoa LY, Albertus P,

Ayanian J. United States Renal Data System: 2016 USRDS Annual Data Report: Epidemiology of Kidney Disease in the United States. Am J Kidney Dis 2017;69:A7-8.
2. Sawalmeh O, Moala S, Hamdan Z, Masri H, Ayoub K, Khazneh E, et al. Pulse versus daily oral Alfacalcidol treatment of secondary hyperparathyroidism in hemodialysis patients: a randomized controlled trial. Int J Nephrol Renovasc Dis 2018;11:25-32.
3. Hojat M. Hemodialysis adequacy in patients with chronic renal failure. Iran J Crit Care Nurs 2009;2:61-6.
4. Hojat M, Karimiar M, Karami Z. Effect of continuous care model on sleep quality and dialysis adequacy of hemodialysis Patients: a clinical trial study. Medsurg Nurs J 2015;4:31-8.
5. Cheng Y, Luo R, Wang K, Zhang M, Wang Z, Dong L, et al. Kidney disease is associated with in-hospital death of patients with COVID-19. Kidney Int 2020;97:829-38.
6. Kalani N, Hatami N, Haghbeen M, Yaqoob U, Raeyat Doost E. COVID-19 Health Care for Afghan Refugees as a Minor Ethnicity in Iran: Clinical Differences and Racial Equality in Health. Acta Med Iran 2021;59:466-71.
7. Cravedi P, Suraj SM, Azzi Y, Haverly M, Farouk S, Pérez- Sáez MJ, et al. COVID- 19 and Kidney Transplantation: Results from the TANGO International Transplant Consortium. Am J Transplant 2020;20:3140-8.
8. Arpali E, Akyollu B, Yelken B, Tekin S, Turkmen A, Kocak B. Case report: A kidney transplant patient with mild COVID- 19. Transpl Infect Dis 2020;22:e13296.
9. Cheng Y, Luo R, Wang K, Zhang M, Wang Z, Dong L, Li J, Yao Y, Ge S, Xu G. Kidney disease is associated with in-hospital death of patients with COVID-19. Kidney international. 2020 May 1;97(5):829-38.
10. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. JAMA 2020;323:1061-9.
11. Fares R, Zgheib A, Hallit R, Hallit S. Oseltamivir-induced behavioral changes in a female Lebanese adolescent: a case report of a usual drug with unusual side effect. Future Sci OA 2020;6:FSO602.
12. Owens B. Hydroxychloroquine side-effects raise concerns for rheumatology patients. Lancet Rheumatol 2020;2:e390.
13. Ng M-Y, Lee EY, Yang J, Yang F, Li X, Wang H, et al. Imaging profile of the COVID-19 infection: radiologic findings and literature review. Radiol Cardiothorac Imaging 2020;2:e200034.