Al-Azhar Med. J . (Medicine). *Vol. 52 (2), April, 2023, 661-674*
DOI: 10.21608/amj.2023.291656
https://amj.journals.ekb.eg/article_291656.html

EPIDEMIOLOGICAL FEATURES AND RISK FACTORS AFFECTING OUTCOME IN HEMODIALYSIS PATIENTS WITH COVID-19 INFECTION

By

Mohamed Fawzy Ahmed Mohamed Ramadan, Fawzy Hamed Hassan Saafan, Marwa Ali Haseeb Tahoun*, Mohamed Ahmed El-Sayed Ahmed

Department of Internal Medicine and Nephrology, Faculty of Medicine, Al-Azhar University

Department of Epidemiology & Preventive Medicine*, Faculty of Medicine, Menofia University

Corresponding author: Mohamed Fawzy Ahmed Mohamed,

E-mail: drmohamedfawzy11@gmail.com

ABSTRACT

Background: Reports would suggest a more severe disease course in patients with chronic kidney disease, although outcomes in maintenance hemodialysis patients are still unclear, with earlier small case series suggesting a milder course. Management of maintenance hemodialysis patients in the context of an epidemic poses several challenges: this group of patients usually requires caregiver assistance and transportation from home to the dialysis units, and they must spend time in crowded waiting areas before and after treatment. Moreover, maintenance hemodialysis patients are usually old and affected by several comorbidities that are known to be associated with high risk of poor outcomes in patients with COVID-19.

Objectives: To describe the clinical setting, treatment and clinical outcomes of COVID-19 in patients with chronic kidney disease Stage 5D. To describe epidemiological features and risk factors affecting outcome in end stage renal disease patients with COVID-19 infection.

Patients and Methods: This is a retrospective observational multicentre study included 33 patients with end stage renal disease on conventional hemodialysis from January 2021 to April 2021. The study was conducted in Nephrology Unit Bap El-Sharia, University Hospital and Menofia University Hospital.

Results: 33 patients were eligible for final analysis, they had a mean age 61.24± 9.17 years old, and a mean weight 70.73 ± 17.68 Kg males represented 54.5% of the included patients, moreover, 45.5% of the included patients were smokers. prevalence of diabetes was significantly higher among patients who survived with p value 0.011, contrary, obesity was more prevalence among the expired group with p value 0.017, however, prevalence of hypertension, peripheral vascular disease, cardiac disease, chronic respiratory disease and malignancy was not significantly different between both groups with p values >0.05 each. Regarding laboratory findings, blood urea nitrogen (BUN) pre-dialysis was significantly higher among patients who died after being infected with COVID-19 with p value 0.03, Albumin was significantly higher among patients who recovered and was discharged after COVID-19 infection with p value 0.002, and C-reactive protein (CRP) was significantly higher in the expired group with p value 0.03. All Infected patients who failed to achieve weaning of mechanical ventilation died in the current cohort.

Conclusion: There was no significant difference in primary kidney disease of COVID19 hemodialysis patients and mechanical ventilation. There was no significant difference in laboratory finding, severity of hemodialysis and comorbidities of COVID19 hemodialysis patients and mechanical ventilation.

Keywords: Risk Factors, hemodialysis, COVID-19, Infection.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) is an emerging infectious disease that was first reported in December 2019 in Wuhan, China *(Huang et al., 2020)*. COVID-19 has spread worldwide within 3 months, and the World Health Organization designated COVID-19 as a global pandemic. The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection can lead to lethal pneumonia associated with high rates of hospitalization in intensive care units (ICUs) *(Wu et al., 2020)*.

The largest series of patients with COVID-19 in China, Italy *(Grasselli et al., 2020)* and in a recent meta-analysis *(Zheng et al., 2020)*, reported comorbidities such as hypertension, cardiovascular diseases, diabetes, obesity and immunodeficiency associated with increased mortality in COVID-19. Furthermore, chronic kidney disease (CKD) is an independent factor in mortality during COVID-19 associated with poor hospital outcomes *(Henry and Lippi, 2020)*.

Unfortunately, few data are available on the incidence and severity of COVID-19 in patients on chronic dialysis. In fact, only three small series have studied such patients at this point in time *(May 2020) (Goicoechea et al., 2020)*.

Chronic dialysis patients are at increased risk of viral transmission. They interact three times a week with medical transporters, nurses, paramedics, medical workers and other patients from their dialysis facility. In addition to CKD, they display frequent associated comorbidities such as hypertension, cardiovascular diseases and diabetes. They also have impaired immune responses. Haemodialysis units have stringent hygiene protocols, and specific recommendations have been recently published by a European working group of nephrologists *(Basile et al., 2020)*.

Thus, the risk of hand-transmitted disease is reduced by the establishment of these systematic protective measures. However, the measures limiting the risk of transmission by air are not similarly controlled. Data on incidence and mortality of COVID-19 and associated risk factors are limited in dialysis centres. This multicentre observational cohort study describes the clinical setting, treatment and clinical outcomes of COVID-19 in patients with CKD Stage 5D from 11 dialysis centres in two French regions. Few data are available in patients with end-stage renal disease (ESRD) *(Bataille et al., 2020)*.

PATIENTS AND METHODS

This is a cohort multicentre study with retrospective data analysis including 33 COVID-19 positive patients with end stage renal disease on conventional hemodialysis from January 2021 to April 2021. The study was conducted Nephrology Unit Bap El-Sharia, University Hospital and Menofia University Hospital. All data were collected in the period prior to ICU admission. Some patients from this study have already been included in another study published previously.

Inclusion criteria: Adults > 18 years old who are Diagnosed with COVID-19 by asopharyngeal real-time reverse transcriptase–polymerase chain reaction (RT-PCR) positive for SARS-CoV-2 and/or a positive chest computed tomography (CT) scan (presence of bilateral lesions like ground-glass opacity, crazy paving consolidation or pleural effusion).

Exclusion criteria: Patients who had renal replacement therapy initiated <1 month before.

All patients were subjected to:

Full history taking from patients including sex, age, weight, dialysis vintage, primary kidney disease, EPO use, and iron treatments. As well as, Complete clinical examination. baseline laboratory work-up as serum creatinine, blood urea, BUN pre, BUN post, CRP, iron profile, S.Albumin, CBC, iPTH and serum magnesium.

All patients underwent RRT 3 times per week and 4 h per dialysis. SARS-CoV-19 test was done for all symptomatic patients and whom on contact with, Chest computed tomography was done for all patients and Quick COVID-19 Severity Index (qCSI) which predicts 24-hr risk of critical respiratory illness was applied to all positive patients.

SARS-CoV-2 infection is defined as detection of SARS-CoV-2 RNA in a nasopharyngeal swab specimen with quantitative real-time RT-PCR or in case of negative RT-PCR, a chest CT scan with a high level of suspicion (COVID-19 Reporting and Data System [CO-RADS] score of greater than or equal to four) in combination with suggestive clinical signs (fever, new-onset respiratory symptoms).

Quick COVID-19 Severity Index include respiratory rate, pulse oximetry, oxygen flow rate and was interpretated as in text. All procedures followed Al-Azhar University ethical committee regulations, and written consent was signed by patients.

Statistical analysis:

Statistics was done to evaluate the results to assess primary outcomes overall mortality, secondary outcome as need of assisted ventilation, hospital stay, development of associated comorbidities. All data were collected, tabulated and statistically analyzed using the IBM SPSS (Statistical Package for the social sciences) statistics for windows, version 23.0 IBM Corp., Armonk, NY: USA. Quantitative data were expressed as the mean ± SD & (range), and qualitative data were expressed as & (percentage). t test was used to compare between two groups of normally distributed variables. Mann Whitney U test was used to compare between two groups of not normally distributed variables. Paired t test was used to compare between paired normally distributed variables. Percent of categorical variables were compared using Chi-square test or Fisher Exact test when appropriate. All tests were two sided. P-value < 0.05 was considered statistically significant, and p-value ≥ 0.05 was considered statistically non-significant.

RESULTS

33 patients were eligible for final analysis, they had a mean age 61.24± SD 9.17 years old, and a mean weight 70.73 ± SD 17.68 Kg males represented 54.5% of the included patients, moreover, 45.5% of the included patients were smokers **(Table 1)**.

Table (1): Basic characteristics of hemodialysis patients with COVID 19 infection (N=33)

Variables	N.	%
Sex		
Females	15	45.5
Males	18	54.5
Smoking		
Smokers	15	45.5
non smokers	18	54.5
Age per years		
Mean ±SD Range	61.24±9.17 42-76	
Weight/kg		
Mean ±SD Range	70.73±17.68 54-133	

CT findings, 63.6% of the included participants had bilateral lung ground glass opacity, those who had bilateral GGO had a severe COVID-19 infection based on the COVID19 severity score, 66.7% were isolated in home, 60.6% were hospitalized, high oxygen flow therapy was required inn 51.5% of the patients while 51.5% required low flow oxygen. Among the included patients, 42.4% were admitted to ICU, thought, 21.2% needed mechanical ventilation, among those only 4 patients (57.1%) were weaned eventually from mechanical ventilation. The time from start of symptoms till mechanical ventilation had a mean of 3.57 ± SD 1.81 days among those who were admitted in ICU and required mechanical ventilation **(Table 2)**.

Table (2): Portray of COVID 19 infection of hemodialysis Patients (N=33).

Variables	N.	%
CT finding		
Both lungs show GGO	21	63.6
Right basal lung shows GGO	12	36.4
COVID19 severity score		
coRADS3	2	6.1
coRADS4	10	30.3
coRADS5	21	63.6
Isolation home		
Yes	22	66.7
No	11	33.3
Hospitalization		
yes	20	60.6
No	13	39.4
High oxygen therapy		
Yes	17	51.5
No	16	48.5
Low oxygen therapy		
Yes	33	100.0
ICU		.
Yes	14	42.4
No	19	57.6
Mechanical ventilation		
Yes	7	21.2
No	26	78.8
Weaning		.
No	3	9.1
Yes	4	12.1
Time of mechanical ventilation		
Mean ± SD Range	3.57±1.81 2-7	

13/32 patients died during the COVID-19 disease course while 20/32 patients survived. There was no significant difference in age, smoking status, gender and body weight among patients who survived versus those who died with p value >0.05 each **(Table 3)**.

Table (3): Relation between demographic characters and survival of COVID19 hemodialysis patients.

	Dead N=13	**Survival N=20**	**P**
Sex			
Females (N=15)	7(46.7)	8(53.3)	0.34
Males (N=18)	6(33.3)	12(66.7)	
Smoking			
Smokers (N=15)	7(46.7)	8(53.3)	0.34
non –smokers (N=18)	6(33.3)	12(66.7)	
Age per years			
Mean ±SD	62.61±7.98	60.35±9.96	0.497
Weight /kg			
Mean ±SD	79.15±24.6	65.25±7.94	0.07

Using fisher exact test, prevalence of diabetes was significantly higher among patients who survived with p value 0.011, contrary, obesity was more prevalence among the expired group with p value 0.017, however, prevalence of hypertension, peripheral vascular disease, cardiac disease, chronic respiratory disease and malignancy was not significantly different between both groups with p values >0.05 each **(Table 4)**.

Table (4): Relation between comorbidity and survival of COVID19 hemodialysis patients (n=33)

	Renal dialysis COVID19				p-value
	Dead N=13		Survival N=20		
	No.	%	No.	%	
Diabetes mellitus					
Yes	2	14.3	12	85.7	**0.011***
No	11	57.9	8	42.1	
HTN					
Yes	8	50.0	8	50.0	0.23
No	5	29.4	12	70.6	
Peripheral vascular disease					
Yes	4	44.4	5	55.6	0.99
No	9	37.5	15	62.5	
Chronic respiratory disease					
Yes	6	60.0	4	40.0	0.14
No	7	30.4	16	69.6	
Cardiac disease					
Yes	4	40.0	6	60.0	0.99
No	9	39.1	14	60.9	
Cancer					
No	13	39.4	20	60.6	
Obesity					
Yes	4	100.0	0	.0	**0.017***
No	9	31.0	20	69.0	
Iron supplement					
Yes	5	38.5	8	61.5	0.93
No	8	40.0	12	60.0	
Vasopressors					
Yes	4	50.0	4	50.0	0.68
No	9	36.0	16	64.0	
Immunosuppressive therapy					
Yes	11	36.7	19	63.3	0.55
No	2	66.7	1	33.3	

Regarding laboratory findings, BUN pre-dialysis was significantly higher among patients who died after being infected with COVID-19 with p value 0.03, albumin was significantly higher among patients who recovered and was discharged after COVID-19 infection with p value 0.002, and CRP was significantly higher in the expired group with p value 0.03. All Infected patients who failed to achieve weaning of mechanical ventilation died in the current cohort **(Table 5)**.

Table (5): Relation between laboratory finding among COVID 19 Infection of hemodialysis Patients and their survival (N=33)

	Dead (N=13)	Survival (N=20)	P-value
Lymphocyte	14(5-22)	16.5(6-34)	0.301
Hb	9.52±0.86	9.8±1.2	0.475
Creat before dialysis session	10.07±1.84	9.46±1.63	0.325
Creat after dialysis session	5.63±1.41	5.51±1.17	0.796
Urea before dialysis session	165(88-312)	155(115-220)	.0366
Urea dialysis session	70(44-110)	76(40-110)	0.618
BUN before dialysis session	31.31±3.64	27.6±5.07	**0.03**
BUN dialysis session	19.84±3.21	17.25±3.82	0.052
Albumin	3.79±0.28	4.06±0.178	**0.002**
D dimer	0.79(.2-0.8)	0.5(0.2-1.7)	0.710
CRP	48(24-96)	24(12-96)	**0.03**
ferritin	378(75-860)	362(23.3-740)	0.868
LDH	530(101-842)	604(107-954)	0.484
time of mechanical vent	3 (2-7)	3 (2-5)	0.853

DISCUSSION

On 30 January 2020, the World Health Organization (WHO) declared the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes COVID-19, to be a Public Health Emergency of International Concern. SARS-CoV-2 is spreading from person to person primarily via direct contact or through direct droplets spread by coughing or sneezing from an infected individual. It has been estimated that the median incubation period of SARS-CoV-2 is 5.1 days and SARS-CoV-2 patients are the main source of infection *(Lai et al., 2020)*.

The average basic reproductive number and doubling time were estimated to be 3.28 and 2.5 days respectively. It has been reported that more than 80% of infected individuals are asymptomatic or show mild symptoms, 15% develop more severe symptoms, and 5% become critically ill. The case fatality rate is estimated at 2–3%. By 25 May 2020, 5 371 700 cases of COVID-19 had been reported globally, including 344 815 deaths. Egypt is among the five countries reporting the highest number of cases in Africa with a total of 17 265 cases as of 25 May 2020 *(Radwan, 2020)*.

Supportive therapy is the main method for the management of symptomatic patients, many of whom require mechanical ventilation and other intensive care services. There is limited information regarding the epidemiology of COVID-19 in maintenance hemodialysis (MHD) patients. MHD patients may be at increased risk of COVID-19 because of many comorbid conditions *(Wang et al., 2020)*.

The aim of this study is to describes the clinical setting, treatment and clinical outcomes of COVID-19 in patients with CKD Stage 5D & describe

epidemiological features and risk factors affecting outcome in end stage renal disease patients with COVID-19 infection.

This is an observational cohort multicenter study with retrospective data analysis including 33 patients with end stage renal disease on conventional hemodialysis from January 2021 to April 2021. The study was conducted Nephrology Unit Bap El-Sharia, University Hospital and Menofia University Hospital.

The study included 18 males representing 54.5%, the mean age was 61.24± SD 9.17 years old, and 45.5% were smokers. Similar to our study reported that the mean age of the patients was 57.15 ± 15.73 years and 51.7% of the patients were male. The most common cause of ESRD was diabetic nephropathy (39.6%) and the mean dialysis vintage was 57.81 ± SD 51.06 months *(Can et al., 2021)*.

In a retrospective study on HD patients with positive COVID-19 infection showed that independent risk factors for death among patients with ESKD were largely similar to those for patients without ESKD. A notable difference that defies obvious explanation was that HTN and the use of ACE inhibitors or ARBs were significant protective factors against death among patients without ESKD *(Ng et al., 2020)*.

In diabetic patients, the first line of defense against SARS-CoV-2 is disrupted, which leads to chronic inflammation or increased coagulation activity, more severe disease, acute respiratory distress syndrome (ARDS), and increased mortality. A study showed that the number of patients who needed ICU had higher number of patients with diabetic nephropathy and pulmonary disease as co-morbid diseases. The insufficient pulmonary reserve of patients with pulmonary diseases might have resulted in respiratory insufficiency that resulted in ICU assistance *(Can et al., 2021)*.

In the current study, CT finding showed 63.6% of patients both lungs show GGO. Also 63.6% of patients had coRADS5. 66.7% of them were isolation at home. In addition, 60.6% admitted to hospital, all patients submitted to low oxygen therapy, then more than one half required high oxygen therapies, and 42.4%were admitted to intensive care unit. Mechanical ventilation was applied for 21.2% of patients and only 12.1% wean of it.

In contrast to our study, the mortality rate was nearly 4%, with 8% requiring ICU admission and 6% requiring mechanical ventilation. This pooled data may be limited by the small numbers of included patients, and we note that only 1.8% of patients in a recent study were admitted to the ICU. Similarly, the pooled data show that among pregnant individuals, 7% were admitted to the ICU, fetal loss occurred in 5%, and half develop obstetric related complications. However, their pooled data were based on only 43 patients drawn from six studies and should be interpreted with caution, but these findings warrant further investigation *(Li et al., 2021)*.

In the present study, incidence of COVID 19 infection among hemodialysis patients was (11.0%) & Mortality rate was 39.4%. Similar to our results a study reported a COVID-19 related mortality rate 31% in 2020 *(Can et al., 2021)*.

Another study which included 123 HD patients showed a mortality rate of 4% which was stated as higher and lower from the studies of China and Italy; respectively. The study period was short and the number of excluded patients was high and four cases were still hospitalized when the data were collected, which should explain why their mortality rate was lower *(Tian et al., 2021)*.

The Spanish study reported results close to our study with mortality rate of 30.5%, which is similar to our study. Risk factors including age, DM, obesity, CHD, or COPD were not associated with higher mortality in this study from Spain. They showed that low lymphocyte count and high LDH, and total bilirubin and CRP levels, 7 days after clinical onset, were associated with mortality *(Goicoechea et al., 2020 and 10, 27)*.

While another study reported that COVID-19 patients who persistently had low lymphocyte counts died of the disease, and patients who showed improvements of lymphocyte counts during the hospitalization survived *(Ozturk et al., 2020)*. It was also stated that severe lymphopenia 0.6x109/L can be a sign for early admission to the ICU. Lower lymphocyte counts were observed in COVID-19 patients with ARDS and neutrophilia was associated with increased risk of mortality as reported in *(Wu et al., 2020)*.

Similar to ours and previous findings Regarding HD patients, a study showed that patients who needed ICU and died because of COVID-19 had also significantly lower lymphocyte counts at admission *(Islam et al., 2021)*. Another study showed that patients who deceased because of COVID-19 had significantly higher neutrophil counts at admission *(Shang et al., 2021)*. Comparison between infected and uninfected HD patients revealed no appreciable differences in leukocyte, neutrophil and lymphocyte counts. Regarding our patients with poor prognosis, lower neutrophil and lymphocyte counts were prominent before infection and at admission; respectively *(Tian et al., 2020)*.

In the present cohort, non-diabetic patients had significant higher mortality rate than diabetic patients p= 0.011. Also, obese patient had significant higher mortality rate than non-obese patients p= 0.017. While there was statistically non-significant relationship between other comorbidities and survival of COVID19 hemodialysis patients.

Moreover, BUN before dialysis session was significantly lower among dead patients compared to whom survival from COVID 19 Infection of hemodialysis Patients., albumin was significantly lower among dead patients compared to whom survival from COVID 19 Infection of hemodialysis Patients. While CRP was significantly higher among dead patients compared to whom survival from COVID 19 Infection of hemodialysis Patients.

Similar to our study findings in *(Tian et al., 2020)* levels of BUN, creatinine, albumin, total bilirubin, ALT, and AST were indicative of abnormal kidney and liver function at the time of admission in non survivors compared to survivors. Mortality was also associated with lower platelet count and elevated D-dimer levels, suggesting a possible coagulopathy in these patients.

Consistent with our study, *Tian et al. (2020)* highlighted that frequency of lymphopaenia, anaemia and thrombocytopaenia, and increased serum LDH levels were significantly lower in the control group, whereas AST levels were higher in the CKD group. The rate of serum CRP increase was significantly lower in the control group than the other groups.

Our results showed that there were no significant differences of Dead and survival and pattern of COVID 19 Infection of hemodialysis Patients $p>0.05$. Except All patients were continuous (not Weaning from Mechanical ventilation) dead.

Similar to our results, patients with ESKD had rates of mechanical ventilation similar to those for patients without ESKD (89 [21.2%] vs. 2076 [20.6%], respectively). In both the crude analysis and the adjusted analysis, the ESKD group did not have significantly higher odds of requiring mechanical ventilation than the non-ESKD group *(Valeri et al., 2020).*

In contrast to our results a single-center study from the United States (US) published recently showed poor outcomes among 59 patients with ESKD—18 (31%) had died within the whole cohort, and 6 (75%) had died within the subset of patients requiring mechanical ventilation this may be due to decrease sample size *(Valeri et al., 2020).*

CONCLUSION

There was no significant difference in Primary kidney disease of COVID19 hemodialysis patients and Mechanical ventilation. There was no significant difference in laboratory finding, severity of hemodialysis & comorbidities of COVID19 hemodialysis patients and Mechanical ventilation.

REFERENCES

1. **Basile G, Gombe G and Pizzarelli F. (2020):** Recommendations for the prevention, mitigation and containment of the emerging SARS-GoV-2 (GOVID-19) pandemic in haemodialysis centres. Nephrol Dial Transplant., 35: 737-741.
2. **Bataille S, Pedinielli N and Bergounioux JP. (2020):** Gould ferritin help the screening for GOVID-19 in hemodialysis patients? Kidney Int., 98: 235-236.
3. **Can Ö, Bilek G and Sahan S. (2021):** Risk factors for infection and mortality among hemodialysis patients during COVID-19 pandemic. International Urology and Nephrology, 20: 1-9.
4. **Goicoechea M, Sanchez Gamara LA and Macias N. (2020):** GOVID-19: clinical course and outcomes of 36 maintenance hemodialysis patients from a single center in Spain. Kidney Int., 98: 27-34.
5. **Grasselli G, Zangrillo A and Zanella A. (2020):** The GOVID-19 Lombardy IGU Network. Baseline characteristics and outcomes of 1591 patients infected with SARS-GoV-2 admitted to IGUs of the Lombardy Region, Italy. JAMA, 323: 1574-78.
6. **Henry BM and Lippi G. (2020):** chronic kidney disease is associated with severe coronavirus disease 2019 (GOVID-19) infection. Int Urol Nephrol., 52: 1193-1194.
7. **Huang G, Wang Y and Li X. (2020):** Clinical features of patients infected with 2019 novel coronavirus in Wuhan China. Lancet, 395: 497—506.
8. **Islam M, Ozturk Y, Koc Y. (2021):** Clinical outcomes of COVID-19 in hemodialysis patients in the city of Zonguldak, Turkey. International Urology and Nephrology, 21: 1-8.
9. **Lai CC, Shih TP, Ko WC, Tang HJ and Hsueh PR. (2020):** severe acute respiratory

syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. International Journal of Antimicrobial Agents, 55(3): 924-929.

10. **Li J, Huang DQ, Zou B, Yang H, Hui WZ, Rui F and Nguyen MH. (2021):** Epidemiology of COVID-19: A systematic review and meta-analysis of clinical characteristics, risk factors, and outcomes. Journal of Medical Virology, 93(3): 1449-1458.
11. **Ng JH, Hirsch JS, Wanchoo R, Sachdeva M, Sakhiya V, Hong S and Nair VV. (2020):** Outcomes of patients with end-stage kidney disease hospitalized with COVID-19. Kidney International, 98(6): 1530-1539.
12. **Ozturk S, Turgutalp K, Arici M, Odabas AR, Altiparmak MR, Aydin Z and Ates K. (2020):** Mortality analysis of COVID-19 infection in chronic kidney disease, haemodialysis and renal transplant patients compared with patients without kidney disease: a nationwide analysis from Turkey. Nephrology Dialysis Transplantation, 35(12): 2083-2095.
13. **Radwan GN. (2020):** Epidemiology of SARS-CoV-2 in Egypt. Eastern Mediterranean Health Journal, 26(7): 768-773.
14. **Shang W, Li Y, Li H, Li W, Li C, Cai Y and Dong J. (2021):** Correlation between laboratory parameters on admission and outcome of COVID-19 in maintenance hemodialysis patients. International Urology and Nephrology, 53(1): 165-169.
15. **Tian M, Li H, Yan T, Dai Y, Dong L, Wei H and Li W. (2021):** Clinical features of patients undergoing hemodialysis with COVID-19. In Seminars in Dialysis, 34(1): 57-65.
16. **Tian W, Jiang W, Yao J, Nicholson CJ, Li RH, Sigurslid HH and Malhotra R. (2020):** Predictors of mortality in hospitalized COVID-19 patients: a systematic review and meta-analysis. Journal of Medical Virology, 92(10): 1875-1883.
17. **Valeri AM, Robbins-Juarez SY, Stevens JS, Ahn W, Rao MK, Radhakrishnan J and Husain SA. (2020):** Presentation and outcomes of patients with ESKD and COVID-19. Journal of the American Society of Nephrology, 31(7): 1409-1415.
18. **Wang J, Ba G, Han YQ, Ming SL, Wang MD, Fu PF and Chu BB. (2020):** Cyclic GMP-AMP synthase is essential for cytosolic double-stranded DNA and fowl adenovirus serotype 4 triggered innate immune responses in chickens. International Journal of Biological Macromolecules, 146: 497-507.
19. **Wu G, Ghen X and Gai Y. (2020):** Risk factors associated with acute respiratory distress syndrome and death in patients with coronavirus disease 2019 Pneumonia in Wuhan, China. JAMA Int Med., 180: 934-38.
20. **Zheng Z, Peng F and Xu B. (2020):** Risk factors of critical & mortal GOVID-19 cases: a systematic literature review and meta-analysis. J Infect., 81: 16-25.

الخصائص الوبائية وعوامل الخطورة ومدى تأثيرها علي المردود الاكلينيكى في مرضي الفشل الكلوى المزمن المعاشين علي الاستصفاء الدموى المصابين بعدوى فيروس كورونا-19

محمد فوزى أحمد محمد رمضان، فوزى حامد حسن سعفان، محمد أحمد السيد أحمد، مروة على حسيب طاحون*

قسم الأمراض الباطنة والكلى، كلية الطب، جامعة الأزهر

قسم الوبائيات والطب الوقائي*، كلية الطب، جامعة المنوفية

E-mail: drmohamedfawzy11@gmail.com

خلفيـــة البحـــث: تشـــير التقـــارير إلـــى مســـار مـــرض أكثـــر شـــدة فـــي المرضـــى الـــذين يعـــانون مـــن مـــرض الكلـــى المـــزمن، علـــى الـــرغم مـــن أن النتـــائج فـــي مرضـــى غســـيل الكلـــى الصـــيانة لا تـــزال غيـــر واضـــحة، مـــع سلســـلة الحـــالات الصـــغيرة المبكـــرة التـــي تشـــير إلـــى مســـار أكثـــر اعتـــدالًا. تطـــرح إدارة مرضـــى غســـيل الكلـــى المداومـــة فـــي ســـياق الوبـــاء عـــدة تحـــديات: عـــادة مـــا تتطلـــب هـــذه المجموعـــة مـــن المرضـــى مســـاعدة مقـــدم الرعايـــة والنقـــل مـــن المنـــزل إلـــى وحـــدات غســـيل الكلـــى، ويجـــب علـــيهم قضـــاء بعـــض الوقـــت فـــي منـــاطق الانتظـــار المزدحمـــة قبـــل العـــلاج وبعـــده. عـــلاوة علـــى ذلـــك، عـــادة مـــا يكـــون مرضـــى غســـيل الكلـــى المداومـــة كبـــار الســـن ويتـــأثرون بالعديـــد مـــن الأمـــراض المصـــاحبة المعروفـــة بأنهـــا مرتبطـــة بمخـــاطر عاليـــة للنتـــائج الســـيئة لـــدى المرضـــى المصابين بعدوى فيروس كورونا-19.

الهـــدف مـــن البحـــث: وصـــف الإعـــداد الســـريري والعـــلاج والنتـــائج الســـريرية لـــ فيـــروس كورونـــا-19 فـــي المرضـــى الـــذين يعـــانون مـــن الفشـــل الكلـــوى المـــزمن المرحلـــة دي5. ووصـــف الســـمات الوبائيـــة وعوامـــل الخطـــر التـــي تـــؤثر علـــى النتيجـــة فـــي مرضـــى الكلـــى في المرحلة النهائية المصابين بعدوى فيروس كورونا-19.

المرضـــى وطـــرق البحـــث: كانـــت دراســـة إســـترجاعية متعـــددة المراكـــز شـــملت 33 مريضًـــا يعـــانون مـــن مـــرض الكلـــى فـــي نهايـــة المرحلـــة علـــى غســـيل الكلـــى التقليـــدي مـــن

يناير 2021 إلى أبريل 2021. أجريت الدراسة في وحدة أمراض الكلى مستشفى باب الشريعة، ومستشفى جامعة المنوفية.

نتائج البحث: كان 33 مريضا مؤهلين للتحليل النهائي، وكان متوسط أعمارهم 61.24 ± 9.17 سنة، ومتوسط وزن 70.73 ± 17.68 كجم يمثل الذكور 54.5٪ من المرضى المشمولين، علاوة على ذلك 45.5٪ من المرضى المشمولين كانوا مدخنين. كان انتشار مرض السكري أعلى بشكل ملحوظ بين المرضى الذين نجوا. وعلى العكس من ذلك، كانت السمنة أكثر انتشارًا بين المجموعة المنتهية الصلاحية، ومع ذلك، لم يكن إنتشار إرتفاع ضغط الدم وأمراض الأوعية الدموية الطرفية وأمراض القلب وأمراض الجهاز التنفسي المزمنة والأورام الخبيثة. تختلف اختلافًا كبيرًا بين المجموعتين. فيما يتعلق بالنتائج المعملية، كان نيتروجين اليوريا في الدم أعلى بشكل ملحوظ بين المرضى الذين ماتوا بعد الإصابة بعدوى فيروس كورونا-19، وكان الألبومين أعلى بشكل ملحوظ بين المرضى الذين تعافوا وخرجوا من المستشفى بعد الإصابة بعدوى فيروس كورونا-19. كانت القيمة 0.002، وكان البروتين التفاعلي أعلى بشكل ملحوظ في المجموعة منتهية الصلاحية. توفي جميع المرضى المصابين الذين فشلوا في تحقيق الفطام عن طريق التهوية الميكانيكية في المجموعة الحالية.

الاستنتاج: لم يكن هناك فرق معنوي في مرض الكلى الأولي لمرضى غسيل الكلى المصابين بعدوى فيروس كورونا-19 والتهوية الميكانيكية. لم يكن هناك فرق كبير في النتائج المختبرية وشدة غسيل الكلى والأمراض المصاحبة لمرضى غسيل الكلى المصابين بعدوى فيروس كورونا-19 والتهوية الميكانيكية.

الكلمات الدالة: عوامل الخطر، غسيل الكلى، فيروس كورونا-19.