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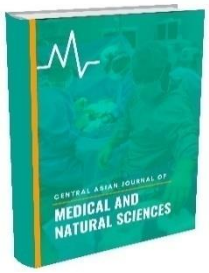

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Kidney Failure Caused by Covid-19 and Kidney Failure Caused by Other Causes

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Abstract: The current study, which included a statistical collection of patients infected with Corona virus who had complications due to infection with this virus and those with kidney failure as a result of complications from the pandemic, was conducted in the dialysis department of Al-Hussein Teaching Hospital in Thi Qar Governorate for the period from January to August of 2021. The study explained ,that the percentage of males exposed to kidney failure was higher than the percentage of females, according to the statistic that was conducted in the dialysis department of Al Hussein Teaching Hospital in Dhi Qar Governorate. And the age range ranged from 40 to 86 years for patients exposed to kidney failure as a result of complications caused by infection with Covid, which takes a sharp curve due to lack of awareness or failure to give appropriate treatment for this virus or due to an immune defect in the patient. Which led to several complications, including kidney failure due to the virus reaching the kidney membrane of patients.

Key words: Kidney failure, COVID-19, renal insufficiency, CKD, SARS-CoV-2.

Introduction

Coronaviruses COVID-19 is one of the different types of viruses, some of which cause disease. The coronavirus that was diagnosed in 2019, SARS-CoV-2, caused the largest outbreak of respiratory diseases, called COVID-19. The first cases of COVID-19 were reported on December 1, 2019, and the cause was the new coronavirus then called SARS-CoV-2. This SARS-CoV-2 virus may have been an animal source and then mutated to cause disease in humans, as many cases of infectious diseases were traced back to viruses that originated in pigs, bats or other animals that evolved to become dangerous to humanity. Several studies have revealed how the coronavirus has evolved to cause an epidemic disease (1). Symptoms may appear in people within 2 to 14 days after exposure to the virus, and a person carrying the Corona virus may be contagious to others in up to two days before symptoms appear, or become contagious to others within a period of 10 to 20 days, depending on the strength of the device The person's immune system and the severity of their disease (3). The symptoms of Covid-19 disease also include the following: , cough , fever or chills , Shortness of breath or difficulty

breathing , muscle or body aches , Sore throat , loss of sense of taste or smell, Diarrhea and Headache(3).

Most people infected with the COVID-19 virus suffer from one group of mild illnesses, while another group does not show any symptoms at all. However, in other cases, COVID-19 can lead to respiratory failure, permanent lung and heart damage, nervous system problems, kidney failure and death. The kidneys are one of the most important vital organs that can be negatively affected when infected with the emerging corona virus, as it affects their ability to perform their vital functions in most critical cases, due to the lack of blood nutrition to them, or due to inflammation resulting from infection through infection of the alveoli, which May lead to a lack of oxygen inside the body (4).

The importance of coronavirus disease 2019 (COVID-19) is seen in people recovering from this virus who are more at risk of being affected by severe sequelae as a result of their frequent use, which include the lung systems or many other extrapulmonary systems - also generally referred to by the long term COVID. However, it is not yet available a detailed assessment of the outcome of the injuries and kidney damage in COVID for a long time, as it is shown here that it is considered the acute phase of this disease, as those who recovered from this disease for 30 days from COVID-19 showed a higher risk of infection With AKI, eGFR declines, ESKD, and major reversible kidney disease events (MAKE), acute longitudinal eGFR declines are also demonstrated. The risk of renal failure outcomes also increased according to the severity of acute injury (classified by non-hospital, intensive care admission data). (4)

As the infection with kidney failure caused by other causes that do not include infection with the Covid-19 virus may include a group of kidney failure diseases caused by chronic high blood pressure, or as a result of excessive use of medicines, or chronic diseases that include type 2 diabetes or other injuries. Which may lead to the patient's access to the stage of dialysis.(Hippisley-Cox J, *et al*., 2008)

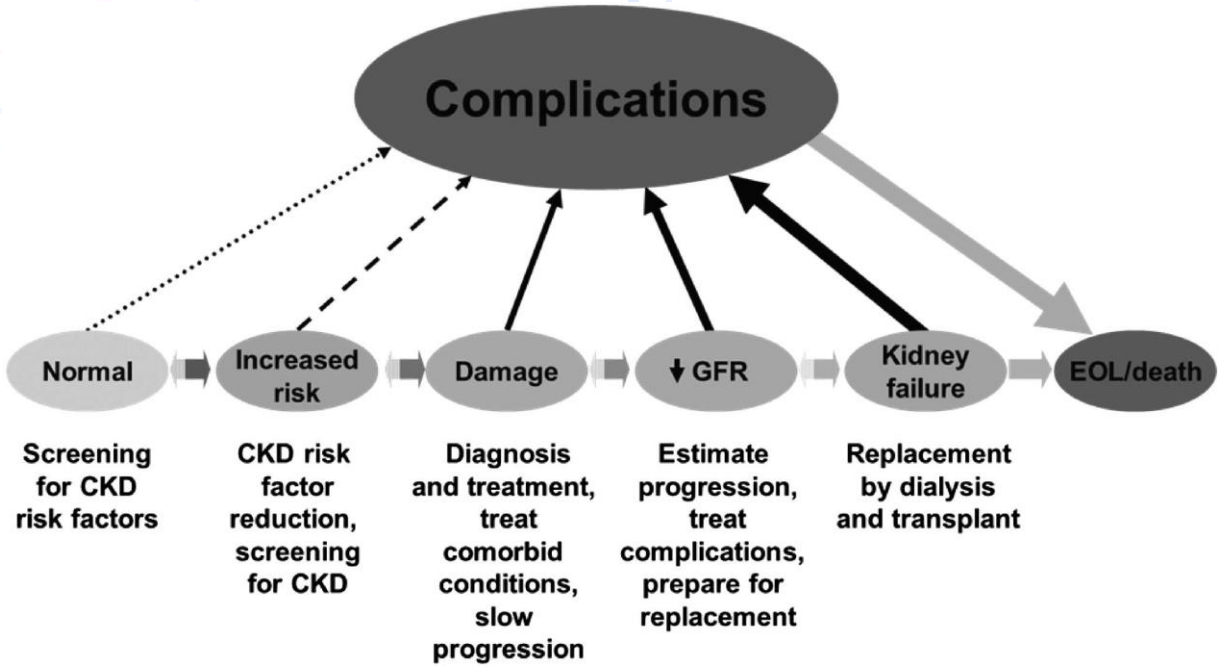


Figure 1 : Conceptual model of CKD. Continuum of progression, development and CKD and strategies to improve outcomes.

Horizontal arrows between represent progression and remission in chronic kidney. The horizontal arrows on the left indicate a lower incidence of the disease Iterative progression process. While the Qatari stocks represent the existence of complications of chronic renal disease, which include drug

toxicity and endocrine disorders diseases of the heart and blood vessels and others such as adverse effects of preventive or curative interventions.

National Kidney Foundation. Access it http://download.journals. ElsverHealth.

Materials and methods :

1-Data

A collection of statistics was conducted for the number, gender and age of patients infected with the Corona virus who have other complications due to infection with the virus, which included kidney failure. Data were collected from the dialysis department of Al-Hussein Teaching Hospital in Dhi Qar Governorate, during the period from January 2021 to August 2021 .

2- Data collection

This study evaluates a review of the research that emphasizes the degree of relationship between infection with Covid and kidney failure, which sometimes coincides with high rates of pandemic infection in most patients. The results of this study will contribute significantly and effectively to emphasizing the great importance of observing the occurrence of kidney failure and its relationship to the Corona virus in some patients in particular. method: The first step in this study was to conduct a search for electronics in Scopus (http://www.scopus.com/), Sci-enceDirect (http://www.sciencedirect.com/), ElSEVIER https://elsevier.com /about/open-science/access-journal, https://academic.oup.com/journals/pages/open_access. Using the following keywords: (Covid), (pandemic and its relationship to kidney failure) and (kidney failure due to virus). Such a procedure allows selection of papers and research published on the relationship of lung failure to infection with the acute corona virus. There were no specific restrictions on the year or date of publication, due to the lack of research in this field. There were no restrictions on the methodology that was used, the types of analysis that were followed, and the method of measuring the results. In addition, there were no restrictions on the type of infection or its area in the kidneys and other tests, and criteria for selecting papers were determined for the purpose of evaluating the conditions of viral infection with Covid and my relationship to kidney failure events in most patients (5).

Results

The current study, which included a statistical procedure for patients recovering from infection with the virus, showed the occurrence of severe kidney injuries as a result of the entry of this virus into the kidney basin, which led to damage to the tissues surrounding the kidneys, as well as the glomerular tissues and ureters. On patients with kidney failure as a result of secondary complications due to infection with this virus, as shown in Table No. 1 .

Table (1): patients infected with the Corona virus, which causes kidney failure

No	Gender	The age
1	Female	80
2	Female	89
3	Male	70
4	Male	65
5	Female	17
6	Female	66
7	Female	67
8	Male	50
9	Male	70
10	Male	45

11	Male	56
12	Female	77
13	Male	61
14	Male	31
15	Male	65
16	Female	84
17	Male	23
18	Male	80
19	Male	65
20	Male	75
21	Male	73
22	Female	55
23	Female	50
24	Male	65
25	Male	40
26	Male	85
27	Male	48
28	Male	35
29	Male	38
30	Female	25
31	Male	86
32	Male	30
33	Female	56
34	Female	80
35	Male	51
36	Male	40
37	Female	62
38	Female	80
39	Female	41
40	Female	53
41	Female	41
42	Male	70
43	Male	49
44	Male	73
45	Male	43
46	FeMale	68
47	Female	45
48	Male	85
49	Male	40
50	Female	18
51	Male	55
52	Male	18
53	Male	43
54	Female	60
55	Male	51
56	Male	71
57	Female	67

58	Male	39
59	Female	70
60	Female	40

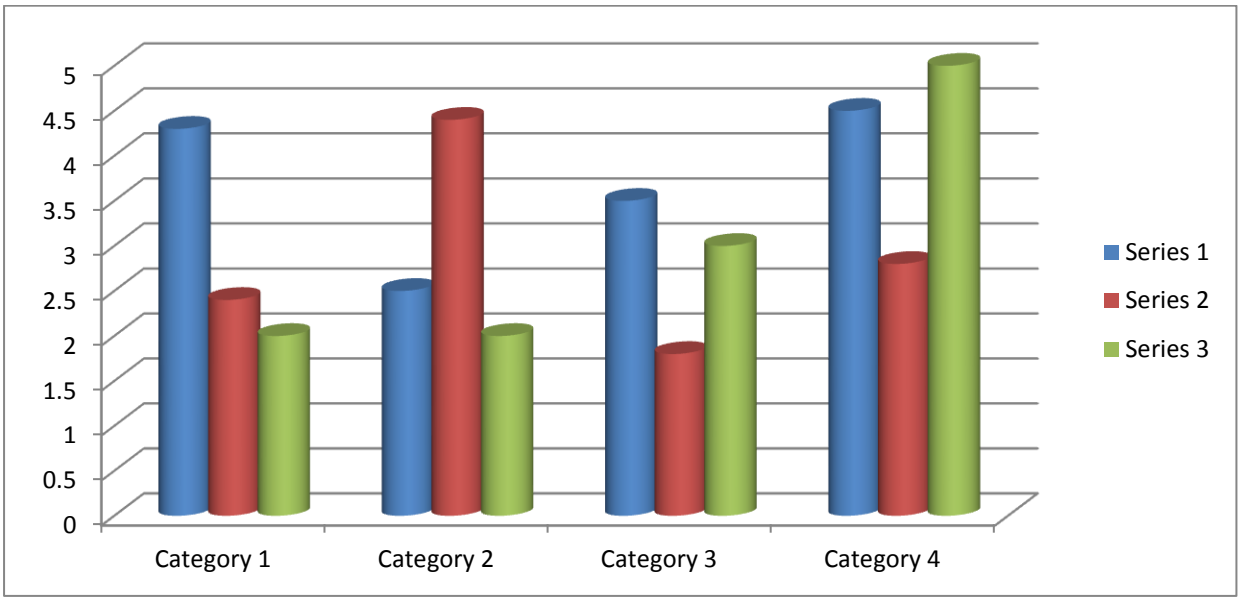
Femal 30% , male 70%.

It is clear from the above table that the percentage of males exposed to kidney failure was higher than the percentage of females, according to the statistic that was conducted in the dialysis department of Al Hussein Teaching Hospital in Dhi Qar Governorate. And the age range ranged from 40 to 86 years for patients exposed to kidney failure as a result of complications caused by infection with Covid, which takes a sharp curve due to lack of awareness or failure to give appropriate treatment for this virus or due to an immune defect in the patient. Which led to several complications, including kidney failure due to the virus reaching the kidney membrane of patients.

This study agreed with what was stated by a number of researchers in other countries, which showed an acute kidney injury (AKI) which ranged from 0.5% to 56.9% In a series of different cases (Table 2), which showed The extent of injury should be related to the different cases used . Studies have shown the highest incidence of renal failure in In the United States and more than in China.4–6,13–19 Also, other studies from China reported the beginning of the occurrence of Kidney failure within 7 to 14 days After injury, while another large study was conducted for a group of patients They were hospitalized with COVID-19 In the United States, 17 patients found that kidney failure had occurred in early time; Also, 1,993 (36.6%) of 5,449 patients in different parts of the United States showed up. Developed acute renal failure, as studies have shown that of these, 37.3% Symptoms may develop during 24 hours after injury. Other studies have also shown that a number of people with rheumatoid arthritis may 31.1% reached the highest stage, which is the third stage (the highest specifically As a 3-fold increase in Creatinine within 7 days, as the kidneys were cultured They have), and 14.3% of patients needed a kidney transplant . As shown in another study, 20 79 (31%) out of 257 are in critical condition As patients need to have the kidneys replaced as well Psychiatric treatment.

Table (2): A shows a number of studies that have been linked to infections with the Corona virus and their relationship to kidney failure and the percentage of patients' need for kidney transplantation.

Authers	No. of patients	Incidence of acute kidney injurya	Use of kidney replacement therapy
Huang et al5	41	7%	7%
Chen et al16	99	3%	9%
Wang et al6	137	3.5%	1.3%
Yang et al14	51	29%	16%
Guan et al 18	1.09	0.4%	0.7%
Zhou et al 9	190	14%	5%
Cheng et al 10	700	5%	not
Arentz et al 18	20	19%	not
Richardson et al 8	2.35	22%	3%
Pei et al 19	332	6.5%	not
Hirsch et al 20	5.44	36%	5%
Cummings et al 21	25	not	30%
Fisher et al22	3.3	56.8%	4.8%



FIGUER(1): A shows a number of studies that have been linked to infections with the Corona virus and their relationship to kidney failure and the percentage of patients' need for kidney transplantation.

Studies have also shown that the diagnosis of the pathogen SARS-CoV-2 on kidney tissue and the damage it can cause

The detection of SARS-CoV-2 RNA in different kidney tissues, where it is currently considered one of the most modern and specific virus detection methods, on the other hand, can use other methods based on the polymerase chain reaction, where after the RNA is isolated from the kidneys and associated tissues, as this method is considered appropriate and effective for the purpose of confirming infection. Virus-specific RNA can also be directly detected in tissues by special in situ hybridization (ISH) for this purpose (15, 16).

Renal failure due to natural causes:

1-Electrolyte abnormalities causing normal renal failure:

Na<130 mEq/L or >147 mEq/L in the absence of diuretics in the patient

K<3.5 mEq/L w/K in the absence or abrupt replacement of diuretics

HCO 3 < 22 mM/L High blood pressure that is resistant to drugs or when it is difficult to control Which indicates the following:

a) When there is evidence of damage to a target organ, as in, LVH

b) In the absence of BP control.

c) HTN malignant type, stroke, AKI/ARF, AMI, cardiac dysfunction

SBP/DBP 140/90 on 3 high and total dose treatments, eg diuretic,

in some chronic kidney patients

SBP / DBP 130/80 or on 3 full dose treatments, also includes a diuretic,

In diabetics or patients with renal failure (BM Curtis,2005)

2- Proteinuria

UA Dipstick 1+ (separately, or up to a minimum of 14 days)

UPC > 0.2,UACR > 30 mg g creatine/g albumin (M. Moser,2006)

3- Sickle cell anemia (CKD).

Hb <12 (in female) or <13.5 (in male) g/dL, if sufficient iron is present

20% and iron >100 ng/ml (L.E. Boulware.2006)

Table 3: Contribution of Diseases of the Urinary and Kidney to the Global Burden of Disease by Region and Gender

Disability-adjusted Years lived Years of

Gender and region	Population	Deaths	Life years	with disability	Life lost
Females	3,056,384	397	8,008	2,546	5,450
Males	3,093,849	433	10,45	4,493	5,960
World	6,150,233	83	18,647	7,039	11,415
East Asia	1,850,775	233	5,400	1,858	3,530
Europe and Central Asia	447,180	53	1,417	623	793

Source: **Mathers and others 2006.**

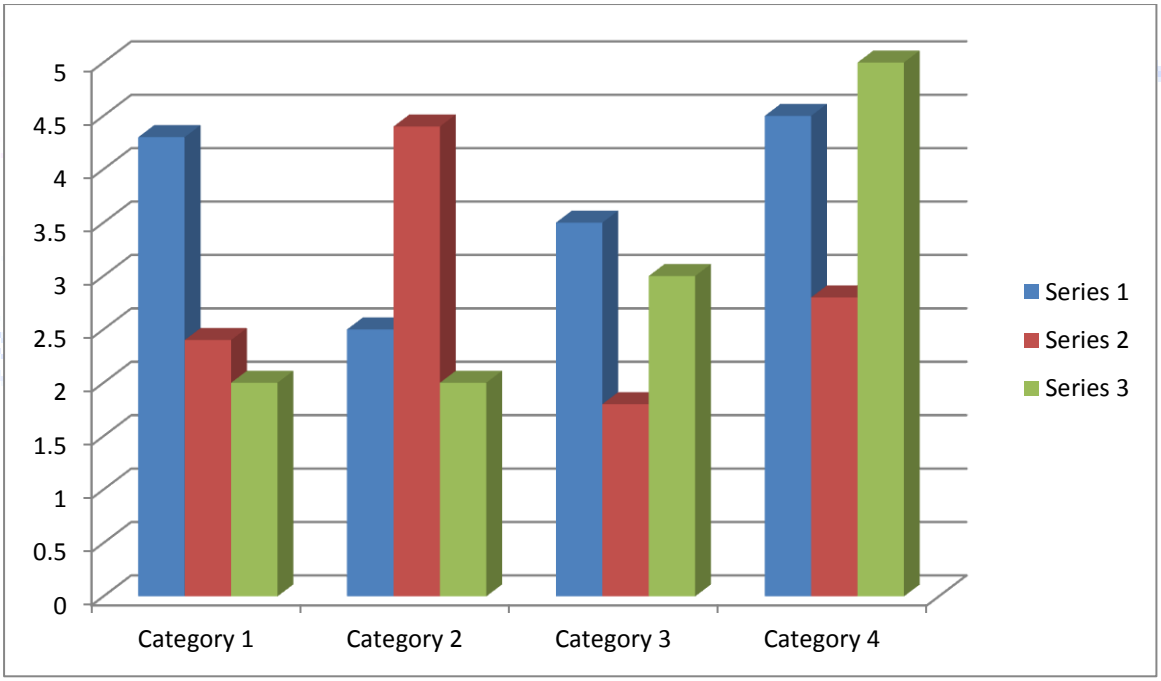


Figure (2): Contribution of Diseases of the Urinary and Kidney to the Global Burden of Disease by Region and Gender

When making a comparison between kidney failure caused by infection with the Covid-19 virus and kidney failure that occurs for normal or other pathological reasons, which include electrical imbalance or due to high pressure, which, as shown in the table above, in the case of kidney dysfunction (30 to 59 ml / min) / 1.73 m^2), and 0.2 percent, patients have chronic kidney disease, or failure resulting from severely low LH Kidney function is a large proportion of these Patients eventually toward ESRD (stage V, or less than 15ml/min/1.73m^2) which requires RRT. Which is important early detection of such cases of kidney failure resulting from high pressure or other reasons to avoid the loss of kidney function.

It also appears from the comparison between the two cases of renal failure that the percentage of women with renal failure resulting from other causes is much higher than the cases of kidney failure resulting from infection with Covid 19, as the percentage of women with renal failure from other causes reached approximately 3,056,384, while when infected with Covid 19 it reached about Approximately 18% of the total cases of Covid infection are under study.

Conclusions:

Kidney disease and renal failure resulting from complications Type 2 diabetes, or high blood pressure, is on the rise globally Which is growing faster in most developing countries. The renal failure It represents a small part of the burden resulting from the high cost of treating this chronic type of disease, along with other chronic diseases, it is clear that the incidence of kidney failure has recently begun to increase due to the spread of modern epidemics and rampant diseases, especially the Covid-19 virus, which has become a great risk of infection with this type of disease. Viruses When the appropriate treatment for the virus is not used, or when the spread of the virus is not controlled in the body due to weak immunity, the cause of kidney failure due to this type of virus has become the other factor causing the increase in the percentage of dialysis patients, which is burdening hospitals.

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