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A Study of Mortality rate, haematological and Biochemical profile of survivors and non - survivors of CKD patients who had COVID 19:

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ABSTRACT:Background: There are studies which have reported high mortality in chronic kidney disease and kidney failure patients who were infected with covid-19 infections.[6,7] Whether this is an independent variable or not is the question as these patients are known to have other associated co-morbidities like cardio-vascular disorders, hypertension and diabetes. These conditions are known to be independently involved with high number of mortality in covid- 19 infections.[7]This study puts in an effort to find the mortality rate of CKD patients not considering other co-morbidities associated with the CKD. This study is intended to be helpful to the practising nephrologists and general physicians so as to understand the mortality rate involved and so take steps accordingly.

Aims and Objectives: To find the mortality rate of CKD patients who had covid-19 infection.

Materials and Methods:

Study design: Cohort study

This study was done in the Department of General Medicine, at DhanalakshmiSrinivasan Medical College,Tamilnadu.

This study was done from September 2020 to August 2021.

Results: The P value when compared to other population who had covid infection was very significant.

Conclusion: To consider the CKD as an independent risk factor for more severe COVID-19 is almost impossible as they will be associated with other co-morbidities.

Keywords: Chronic kidney disease, mortality, Covid, patients, corona virus.

I. INTRODUCTION:

In October 2019 the world witnessed its first patient of Covid-19 which caused respiratory syndrome in Wuhan province of China. The outbreak was reported in the month of December.[1] Since then almost 0.5 million deaths have been reported world-wide and has caused a mass panic world-wide. The health industry has been influenced by it the most and the growing burden is not a good sign for the health care workers as well as the economy.[2]As of July according to WHO website more than half a million people have lost the battle. According to studies the disease is primarily transmitted by droplet mode. That is when a person sneezes or coughs there is a high chance of others in the vicinity to get infected. Plethora of clinical features have been reported since.[3,4] The diagnosis can be done clinically but the gold standard is the polymerized chain reaction test after collecting the samples from the pharynx.[5] Co-morbidities and old age were considered to be very dangerous and more than seventy percent of the diseased were found to be having a co-morbidity or age related illness. There are studies which have reported high mortality in chronic kidney disease and kidney failure patients who were infected with covid – 19 infections.[6,7] Whether this is an independent variable or not is the question as these patients are known to have other associated co-morbidities like cardio-vascular disorders, hypertension and diabetes. These conditions are known to be independently involved with high number of mortality in covid 19 infections.[7]This study puts in an effort to find the mortality rate of CKD patients not considering other co-morbidities associated with the CKD. This study is intended to be helpful to the practising nephrologists and general physicians so as to understand the mortality rate involved and so take steps accordingly.

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II. MATERIALS AND METHODS:

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Inclusion Criteria:
- Confirmed CKD
- Adults > 18 years
- Confirmed cases of covid-19

Exclusion Criteria:
- Patients on immunosuppressant drugs
- Patients on chemo-therapy

A total of thirty patients were taken up for the study that were confirmed to have CKD and were admitted in the hospital for covid-19 infection. Detailed history was taken. Baseline haematological and biochemical markers were evaluated. The follow up tests were evaluated. The patients were followed up for 1 month post recovery. The mortality rate was calculated. Then the haematological and biochemical parameters in patients who succumbed were compared with that of survivors.

III. RESULTS:

Table 1: Age

Number	Mean age	Std Deviation
30	59.29	±9.28

Graph 1: Sex Distribution

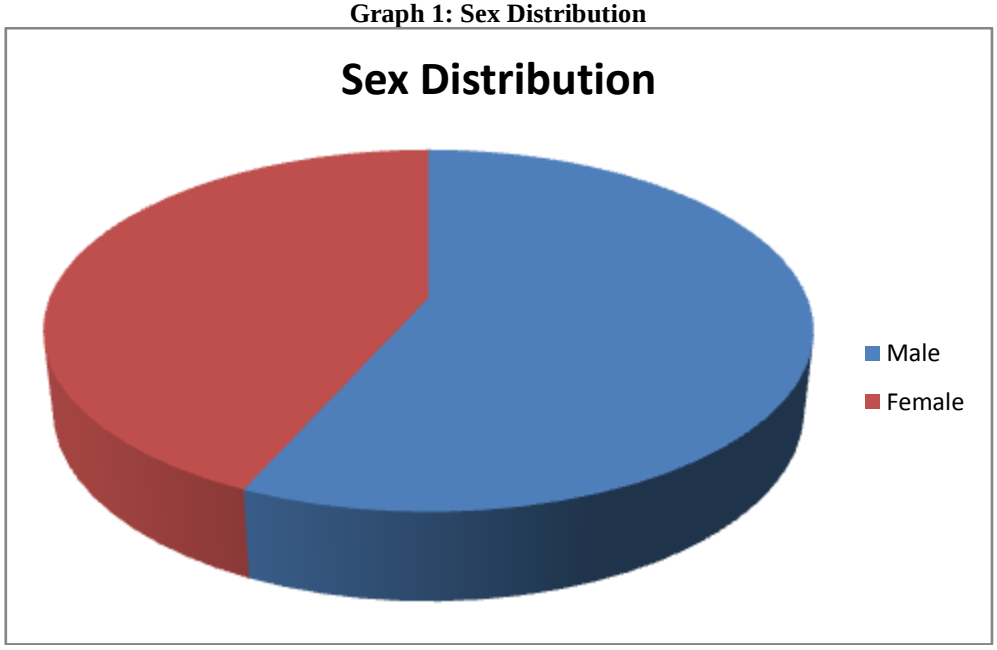

Table 3: Stage of CKD

Stage	Number
CKD-EPT stage 1-2	**3**
CKD-EPT stage 3a	**2**
CKD-EPT stage 3b	**5**
CKD-EPT stage 4	**11**
CKD-EPT stage 5	**9**

Table 4: Primary Kidney Disease

Diabetic nephropathy	**11**
Hypertensive nephropathy	**13**
Polycystic Disease	**02**

Pyelonephritis	**01**
Glomerulonephritis	**02**
Idiopathic	**01**

Table 5: Mortality due to covid complications

Total	Mortality	Percentage	P value
30	19	63.3 percentage	<0.001 (highly significant)

The P value when compared to other population who had covid infection was very significant.

Graph 2: Haematological and Biochemical markers when compared survivors and non – survivors.

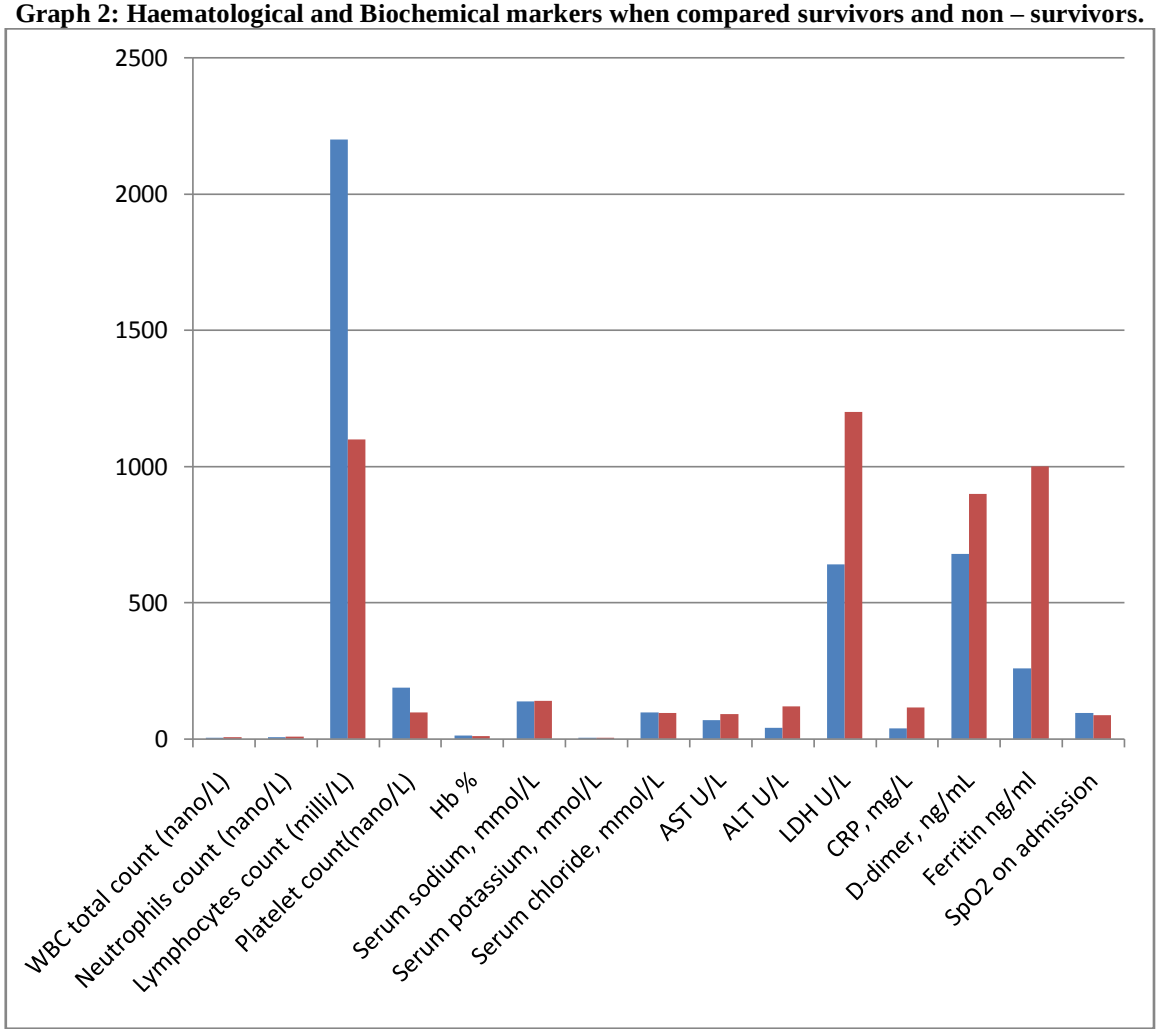

Table 6: HRCT score on admission

CT Score	Mode	Mean value
Survivors	**9**	**9.82**
Non-Survivors	**16**	**17.45**

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Table 7: Onset of symptoms and time of admission

	Mean onset of symptoms	Time of admission
Survivors	**3.54 days**	**5.76 days**
Non survivors	**4.67 days**	**9.78 days**

Table 8: Oxygen saturation on admission and recovered day saturation in survivors

	On Admission	On discharge
Survivors	**94.12**	**92.89**
Non survivors	**86.78**	**-**

Table 9: Remdesevir drug start and effectiveness

	Start day	Total survivors	Adjusted p-value	Sig
Survivors	**5th day**			
Non Survivors	**9th day**	**11**	**<0.001**	**Sig**

- **Considering the start day in non-survivors was on the 9th day the adjusted p value was observed to be <0.001 and was observed to be highly significant.**

IV. DISCUSSION:

Finding the pure relationship with covid infection and finding the natural history of the disease is quiet challenging as we know the fact that CKD as a rule is always associated with other co-morbidities like diabetes and hypertension. A meta-analysis conducted pointed out a fact that the mortality would be at least three times higher in CKD patients who are infected with covid-19.[8]It is very important to know the direct effect of covid-19 on CKD patients. One way is to make a propensity adjusted study but the number of patients is less and so it cannot be generalised. In our study it clearly shows that CKD patients have an increased mortality rate when compared to the general population. But is it purely due to CKD or the co-morbidities will be a question. But it can be safely said that pure CKD is also a co-morbidity on its own. The treatment has to be carefully planned as majority of the drugs used in the treatment can be nephron-toxic. The severity of the CKD is also important as suggested by a report in United Kingdom. They in their study have mentioned the stage of the disease is also an important prognostic criterion.[8] CKD also is associated with decreased haematopoiesis. Thus the development and maturation of WBCs especially the lymphocytes are also hampered up to some extent.[9] Immunomodulation may have a role and can be tried in this population for the treatment of Covid-19.

V. CONCLUSION:

To consider the CKD as an independent risk factor for more severe COVID-19 is almost impossible. But it can be safely said that the patients with this disease have a higher risk of mortality rate if they are infected with covid-19.

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