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General Medicine

EFFECT OF KIDNEY DISEASE ON THE MORTALITY OF COVID POSITIVE PATIENTS IN A TERTIARY CARE HOSPITAL, INDIA

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ABSTRACT

INTRODUCTION: CKD and kidney failure are significant comorbidities associated with unfavourable outcomes in patients with COVID-19. Patients with CKD/kidney failure also have a disproportionate burden of other comorbidities (e.g., coronary artery disease, hypertension, and diabetes mellitus) associated with more severe presentations of COVID-19[1]. SARS-CoV-2 infection frequently triggers a massive release of proinflammatory cytokines and may induce coagulation abnormalities that increase the risk of cardiovascular events and multiorgan dysfunction.[2]

MATERIALS & METHODS: It is a retrospective study done in government general hospital Vijayawada from patients admitted with covid positive status having comorbidities, with the help of medical records department, done during 1st April 2020 to 31st March 2021.

RESULTS : Out of 150 patients who had a renal abnormality, 40 (27%)had AKI, 110 (73%) had CKD, and of these patients, 96(64%) patients underwent dialysis, 54(36%) patients did not undergo dialysis, having high mortality mainly in patients having CKD than AKI. Compared to patients with comorbidity without renal abnormality and patients with renal abnormalities, the mortality was high in the later group of patients.

CONCLUSION: There is a significant effect of kidney disease on mortality in covid positive patients. Patients having CKD will have higher mortality compared with AKI. Even though the mortality was seen in patients having comorbidities without renal involvement, mortality was much higher in patients with renal involvement.

KEYWORDS : covid 19, renal disease, comorbidities, outcome.

INTRODUCTION:

The outbreak of a new epidemic carries along with the urgent need to understand how the different segments of the population are affected to develop appropriate public health strategies to protect vulnerable groups and support clinical management and decision-making. The emergence of a novel coronavirus in Wuhan, China, in December 2019, isolated in early January 2020 and later on in February named severe acute respiratory syndrome coronavirus2 (sars-cov2) causing covid-19, promoted global investigations on the effects, clinical manifestations of the virus and on the possible risk factors for severe disease.The patients at high risk for covid-19 are those with a kidney transplant as they are immunocompromised. And those who undergo in-centre hemodialysis treatments thrice-weekly due to inability to self-isolate. CKD is projected as the fifth leading cause of death by 2040 worldwide and one of the top two causes of death before the end of the century in some European countries, particularly those where life expectancy is the longest. CKD emerged as the most common risk factor for severe covid19. Removal of CKD as a risk factor would decrease the percentage of the global population at increased risk of severe covid19 disease from 22%to 17%and thus explains that CKD has increased risk of severe covid-19 for about one in four high-risk individuals worldwide.

METHODS AND MATERIALS:

It is a retrospective study done in the government general hospital Vijayawada, state covid hospital, from 1st April 2020 to 31st March 2021. It is a retrospective study done in patients with covid positive status having comorbidities. Data was collected from the case sheets with the help of the medical records department, and the data was analyzed and tabulated.

INCLUSION CRITERIA:

- AGE> 18YRS
- RTPCR SWAB TEST -POSITIVE COVID 19 PATIENTS WITH COMORBIDITIES LIKE CKD, DM, HTN, BA, CAD, CVA, COPD, CARCINOMA AND OTHERS
- PATIENTS WITH CKD AND eGFR<60

EXCLUSION CRITERIA:

- RT PCR SWAB TEST-NEGATIVE PATIENTS
- RT PCR SWAB TEST- POSITIVE PATIENTS WITHOUT COMORBIDITIES.

RESULTS :

In our study, out of 150 patients who have renal impairment, 40 (27%) had acute kidney injury (AKI), 110(73 %) had chronic kidney disease(CKD).

In 40 (27%) patients who are having AKI 24(16%) were discharged,16(11%) succumbed to death, out of 110 (73%) patients with CKD 32 (21%) discharged, 78 (52%) died.

The p-value of <0.05 was statistically significant, explaining that mortality was primarily high in patients with stages 3-5 of the disease in patients with CKD.

Comorbidity	Discharged	Death	Total
Acute kidney injury	24	16	40
Chronic kidney disease			
Stage I	12	07	19
Stage II	08	12	20
Stage III	05	16	21
Stage IV	05	28	33
Stage V	02	15	17
TOTAL	56	94	150

In patients having AKI 40(27%) patients underwent dialysis are 17(11%) of these 14 (9 %) discharged, 3(2%) died, remaining 23 (15%) did not underwent any dialysis and of these 10 (7%) discharged, 13 (9%) died.

In patients having CKD 110 (73%), 79 (53%) underwent dialysis of which 20 (13%) discharged, 59 (39%) died, out of 31 (21%) patients who didn't undergo dialysis 12 (8 %) discharged , 19 (13%) died .

The p-value of <0.05, which was statistically significant, explains patients having renal abnormality as either AKI or CKD who underwent dialysis or not; the outcome reflects high mortality.

	DIALYSIS				
YES			NO		TOTAL
	DISCHARGE	DEATH	DISCHARGE	DEATH	
AKI	14	03	10	13	40
CKD	20	59	12	19	110

When we consider the outcome of patients with renal abnormality versus patients with comorbidity without renal involvement, mortality was high in patients with renal abnormality as comorbidity, which was statistically proven by having a significant p-value of <0.05.

COMORBIDITIES	DISCHARGE	DEATH	TOTAL
RENAL DISEASE	56(19%)	94(31%)	150(50%)
NONRENAL DISEASE	92(30%)	58(20%)	150(50%)
TOTAL	148(49%)	152(51%)	300(100%)

DISCUSSION:

Some people suffering from severe COVID-19 are showing signs of kidney damage.

Some times the kidney damage requires dialysis. Some hospitals experiencing rush of very ill patients with COVID-19reported that they are short of materials to do the renal procedures.

There was also diverseness across studies, showing all hospitalized patients, only require ICU and, therefore, reported higher AKI incidence. This is consistent with findings identifying requirements for vasopressors or mechanical ventilation as independent risk factors for COVID-19–related AKI 3. Another factor could be the lack of a standardized method for defining AKI.

Some of the studies showed that the patients with ESRD appear to have better outcomes than those with non-dialysis CKD.5

CKD requiring dialysis is associated with severe clinical outcomes and mortality in patients with COVID-19; however, the development of AKI is more strongly associated with severe clinical outcomes and mortality.6 .Close follow-up can be recommended for patients with a reduced glomerular filtration rate (GFR).7

A study of small series confirms that COVID-19 affects grade 4–5 CKD patients, but the prognosis was good if prompt supportive measures are applied.8

A study found that CKD patients in the non-dialytic stage are more prone to COVID-19 disease comparable to those on kidney replacement therapy. While efforts are made to contain the outbreak with several non-pharmaceutical interventions and a massive vaccination campaign aimed to achieve herd immunity in the general population (indirect protection), it is urgent to protect CKD patients through their prompt vaccination directly.9

Some studies showed that the mortality rate was 3.3%, and a significantly higher proportion of patients with comorbidities died than those with none. The comorbidities that predicted death were hypertension, renal disease, cancer and HIV.10

Patients with Comorbidities have higher mortality rate, than the recovery rate, and prolong the clinical course of critical patients.11

Among laboratory-confirmed cases of Covid-19, patients with any comorbidity have poorer clinical outcomes than those without. A more significant number of comorbidities also correlated with poorer clinical outcomes.12

Based on this study, there is a significant association between severity of the covid-19 disease and kidney disease on the mortality rate of the covid positive patients.

A multicenter US study of > 3000 ICU patients reported that 63% of patients with AKI-RRT died, 34% were discharged, and 3% remained hospitalized for 17 days. Of those discharged, 34% remained RRT dependent at discharge, and 18% remained RRT dependent 60 days after ICU admission. More information is needed on the long-term renal outcomes of patients with COVID-19.

CONCLUSION:

This one-year retrospective study which includes dialyzed and non - dialyzed CKD, with other comorbidities and tested covid positive, concludes that age and gender are not significant risk factors for covid-19 infection. However, there is a significant effect of kidney disease on the mortality of covid positive patients.

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