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A Observational Study Of Renal And Liverfunction Tests In Covid-19 Patients In Tertiary Care Centre

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ABSTRACT
Background: An outbreak ofcovid -19 caused by SARS-COV2 was started in December 2019 in Wuhan province of China. On March 11th 2020,WHO declared covid 19 as global pandemic disease.the present study aims at studying correlation of renal and liver function tests in covid 19 patients
Methods: This Prospective Observational study was done from june 2021 to november 2021 in tertiary care hospital. A total of 50 cases male and female were studied based on inclusion and exclusion criteria. All patients tested positive and admitted were done routineinvestigations,patients were sent renal function tests and liver function tests. Patients below 12 years,pregnant women and patients with previous cardiovascular,and renal failure were excluded from the study. The study was carried out in all patients fulfilling the inclusion and exclusion criteria.
Results:A total of 50 patients 19 females and 31 males presented during the study period.In our study there was male preponderance in the ratio 1:1.6.more patients were in the age group 40-50 years.[11].50-60[11] 30-40 [10].it was observed that there is increase in liver function tests like SGPT,SGOT,ALKP,Total bilirubin in covid patients tested after 5 days of admission.it was observed there was two to three fold increase in liver enzymes more in older age groups.furthur it was observed that there was increase in renal parameters of previously normal patients after covid infection
Conclusions: It was Observed from the study that covid illness caused the rise in renal and liver parameters in previously normal patients.it was also observed that patients with ild renal failure landed into dialysis after covid illness.
Keywords:sgot,sgpt,alkp,renalfailure,dialysis.

I. INTRODUCTION

An outbreak ofcovid -19 caused by SARS-COV2 was started in December 2019 in Wuhan province of China. On March 11th 2020,WHO declared covid 19 as global pandemic disease. This pandemic led to 53.7 million confirmed cases and over 1.3 million deaths[4]. Patients can experience a wide range of clinical manifestations, from asymptomatic to critical illness. SARS- CoV2 infection can be grouped into mild , moderate and severe categories[5]. Though SARS-CoV2 mainly affects respiratory system. There is also major crosstalk with organs such as heart , kidney and liver[6,7] .Abnormal LFT results reported in COVID-19 which might be due to liver damage by SARS-COV2 . ACE-2 receptor is expressed in cholangiocytes of the liver as well as hepatocytes but it expression is much higher in cholangiocytes which might act as a potential rout of entry for the virus in the liver leading to deregulation of liver function[8]. SARS-COV2 induced hepatic damage can also be explained by immune mediated inflammation such as cytokine storm[9,4].Amongst the multi-organ damage, the kidney is described as a major target for the infection related acute complications with even a pre-existing abnormal kidney function becoming a risk factor for severe infection and adverse outcomes[1]. Haemodynamic alterations secondary to altered gas exchange in the lungs, volume overload, cytokine storm, volume depletion[1,3]and ACE-2 serves as the binding site of the virus in the lung .It is also expressed in large concentrations on the renal tubular epithelial cells, where it serves as a binding site for the virus particles and possibly contributes to acute worsening of renal function[1].Detailed medical history was obtained from all the cases to assess the presence of comorbid complications in corona affected patients.

II. METHODS

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The present Prospective observational study was done in Department of general medicine in tertiary care hospital from june 2021 tonovember 2021. A total of 50 cases of covid were studied during the periodbased on inclusion and exclusion criteria.Confirmed covid-19 cases on basis of RNA rt-pcrnasopharangeal and oropharyangeal swab samples, admitted in covid-19 dedicated wards patients were chosen for the study . Venous blood samples were collected aseptically in plain vials from each case .Serum separated following centrifugation was analyzed using a biochemistry auto analyzer. All samples were coded and assayed in a blind fashion by an investigator who was unaware of the participant's clinical statusAll patients were done routine investigations like CBP,chest x ray,lft, rft .

Inclusion criteria:-1.all covid patients 2.all covid recovered patients with deranged liver and renal function tests.

Exclusion criteria:-1.patients less than 12 years 2.pregnant women 3.all patients with previous liver abnormalities 4.all patients with previous renal abnormalties 5.patients with l history of alcohol intake 6.patients with infectious etiology like dengue , malaria, typhoid, chikungunya,H1N1 infection .

The statistical software SPASS was used to analyse the data and Microsoft word and excel have been used to generate graphs,figure etc.

III. RESULTS

Ofall the patients 31[62%] were males and 19[38%] were females with female preponderance. The patients enrolled were more in the age group 40-50 around 11[22%] 50-60 around 11[22%] followed by agegroup between30-40 around 10[20%]. It was observed that SGPT and SGOT were increasedtwo to three fold in all patients. Furthur alkaline phosphate was increasedin patients to a milder extent.it was observed creatininelevels were increased three fold in older covidpatients .

Table 1

Gender Distribution

In Table 1 there is a depiction of female preponderance with males 31vsfemales 19 in the ratioM:F [1.6:1]

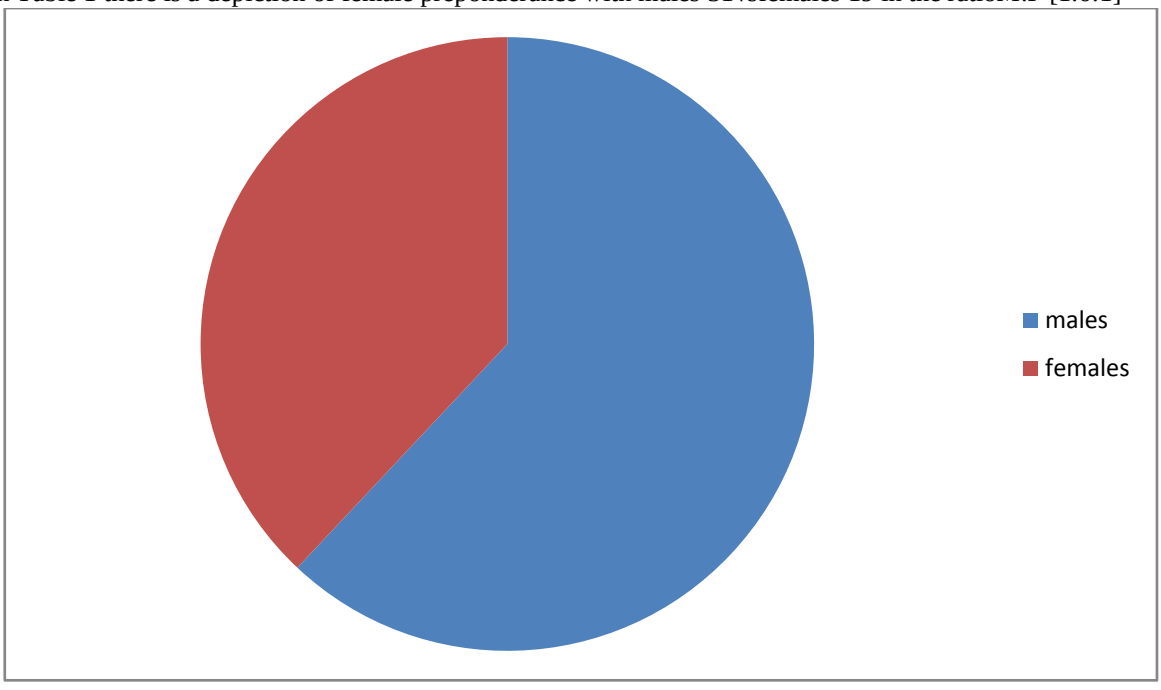

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Table 2
Age Group
In table 2 the patients with covid and liver and renal failure more in 50-60yrs

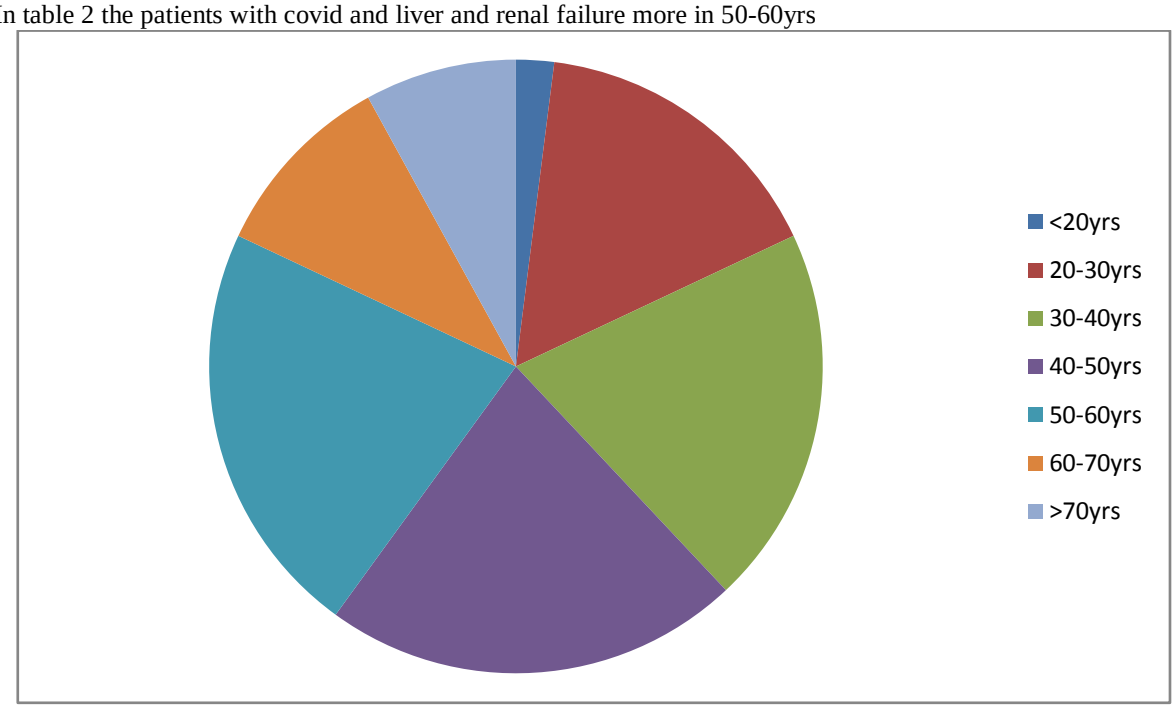

Table 3
In Table 3 the patients with abnormal liver parameters more than twofold in patients

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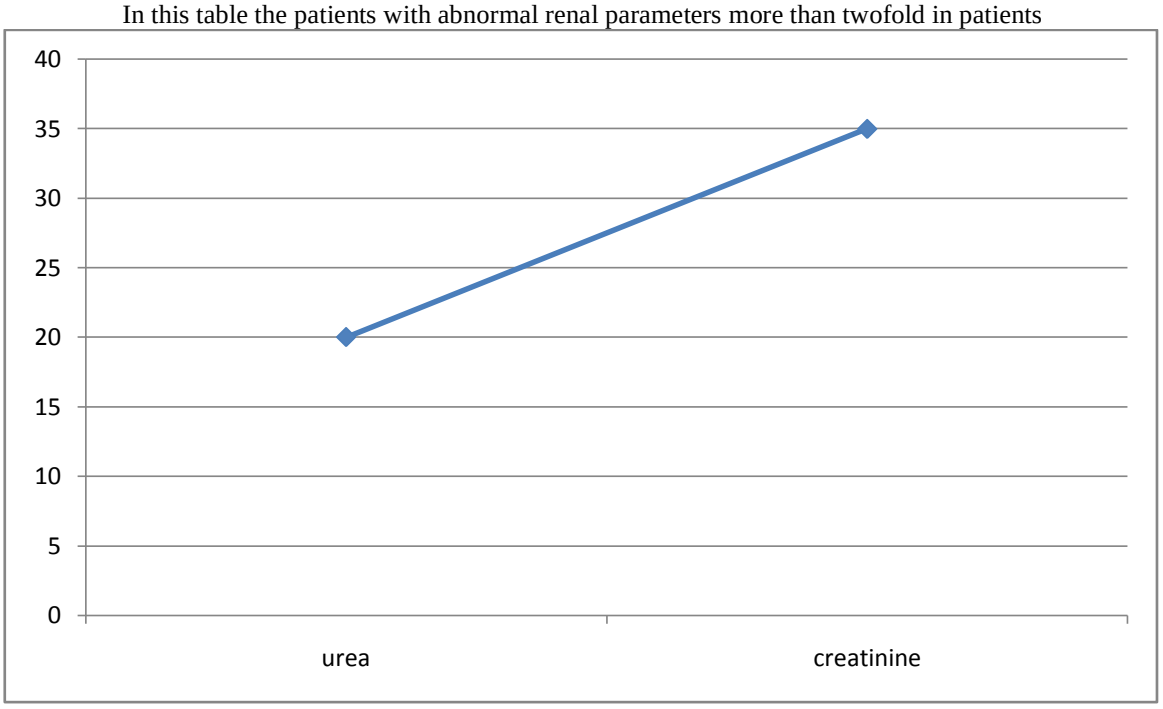
Table 4
In this table the patients with abnormal renal parameters more than twofold in patients



IV. DISCUSSION :

In our study we observed there was male preponderence in the ratio 1.6:1.this was in accordance with the study by Yang etal[1].Further research has to determine the pathogenic underlying mechanism between gender and the severity of SARS-COV-2 infection. Published data suggests that gender differences in susceptibility to SARS-COV (Severe Acute Respiratory Syndrome Coronavirus) in mice were secondary to estrogen receptor signaling, which seemed to be critical for protection in females[10] . However, the role of sex hormones in the regulation of innate immune cells in the lung, as a response to viral respiratory pathogens, is poorly understood[11] .in our study we observed that more number of renal failure patients were in the age group 50-60 years.the older people were affected more due to predisposing risk factors like diabetes mellitus and hypertension.it was observed in our study that there were raised liver enzymes in covid patients .SGPT and SGOT were raised two to three fold in older patients with covid patients. there was also derangement in bilirubin levels in the patients For the 4.5 million people in the US who have been diagnosed with one of the many forms of liver disease, COVID-19 infection can be particularly serious[12,13]. Patients with chronic liver disease are at risk for particularly critical outcomes if they contract COVID-19[14,15]. Transplant recipients and those with hepatocellular carcinoma are especially at risk for developing severe illness. Many of these patients are immunocompromised either by the chronicity of the illness or by the treatment regimen for the condition[16]. For these patients, the viral impact is overwhelming and can result in death.Angiotensin-converting enzyme 2 (ACE2) receptors are found in organs throughout the body, including the heart, kidney, liver, and central nervous system[17,18]. The SARS-CoV-2 spike protein, which protrudes from the virus, binds to ACE2, which serves as a “door” to provide access to the interior of human cells. Once the virus enters the cell, it hijacks cellular machinery to replicate, kills the host cell, and spreads[18].ACE2 is found in abundance on the surface of lung cells, making the lungs a primary target for SARS-CoV-2[18]. However, epithelial cells of the bile duct and liver also express ACE2, providing an easy access point for SARS-CoV-2 to bind directly to ACE2-positive cholangiocytes and disrupt liver function. Elevation of AST and ALT levels have been noted in patients with COVID-19, indicating some degree of liver impairment caused by the virus[19].it was observed that there was increase in renal parameters after covid infection. SARS-CoV-2 interacts with the RAAS through angiotensin-converting enzyme 2 (ACE2), an enzyme that physiologically counters RAAS activation but also functions as a receptor for SARS viruses[20]. ACE2 is a type I membrane protein expressed in lung, heart, kidney, and intestine but mainly associated with cardiovascular diseases[20].

Recent human tissue RNA-sequencing data demonstrated that ACE2 expression in the kidneys was nearly 100-fold higher than in the lung[21]. Therefore, kidney disease may be caused by coronavirus entering kidney cells through an ACE2-dependent pathway. Moreover, RAAS activity is clearly increased in patients with CKD, so there is a systemic increase in ACE2 receptors that might be translated into an easier SARS-CoV-2 cell infection.

V. CONCLUSION:

It was observed in the study that there was male preponderence in our study.there were more number of renal and liver failure cases in the age group 50-60.there were elevations in SGPT and SGOT in normal patients after covid infection.it was also observed there was rise in renal parameters in normal patients after covidinfection.furthur it was observed that patients with mild renal failure landed into dialysis after covid infection.

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