How to Cite:
Mahaboob, R. S., Murty, R., Srivastava, R. K., & Obulesu, G. (2022). Evaluate the liver injury in COVID-19 patients at government medical college and hospital, Ambikapur. *International Journal of Health Sciences*, *6*(S2), 7401–7406. https://doi.org/10.53730/ijhs.v6nS2.6852

Evaluate the liver injury in COVID-19 patients at government medical college and hospital, Ambikapur

Dr. R. Salma Mahaboob
Associate Professor in Biochemistry at Government Medical college and Hospital, Ambikapur, Chhattisgarh. India

Dr. Ramanesh Murty
DEAN, Department of Microbiology at Government Medical college and Hospital, Ambikapur, Chhattisgarh. India

Rajesh kumar Srivastava
Professor in Biochemistry at Government Medical college and Hospital, Ambikapur, Chhattisgarh. India

Dr. G. Obulesu*
Associate Professor in Microbiology at Government Medical college and Hospital, Ambikapur, Chhattisgarh. India
*Corresponding Author

***Abstract*---**A pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or novel coronavirus disease (COVID-19) began in December 2019 in China's Wuhan region and spread worldwide by April 2020, affecting 187 of the world's 192 countries with varied degrees of severity. When alanine aminotransferase (ALT) was > 55 U/l or total bilirubin was > 1.6 mg/dl, a patient was regarded to have liver damage. For laboratory data, the Spearman correlation coefficient was calculated, and bivariable analysis for mortality and/or the need for intensive care was performed. Aim: To evaluate the liver injury in covid-19 patients at government medical college and hospital. Methods and Materials: All the Patients were admitted in Covid ward at Govt. medical college and hospital, Ambikapur, Chhattisgarh. India. Present study were divided into two groups. Group-I: Female COVID Positive Patients -20, Group-II –Male COVID positive Patients -20.Conclusion: To summarise, patients with COVID-19 in Ambikapur, Chattisgarh, had a significant rate of abnormal liver function tests, which was linked to poorer outcomes when they developed severe acute respiratory distress syndrome.

***Keywords*---**COVID-19, liver function test, AST, ALT, bilirubin, coronavirus.

Introduction

In December 2019, a pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or novel coronavirus disease (COVID-19) started in China's Wuhan province and spread over the world by April 2020, hitting 187 of the world's 192 countries with varied degrees of severity[1]. COVID-19 has no recognised cause, natural history, or optimum treatment, and nothing is known about the disease's clinical spectrum in non-Asian cultures. COVID-19 is often asymptomatic, but when it is, it causes flu-like symptoms (dry cough, sore throat, fever, widespread muscle pain) that can be exacerbated by SARS-related interstitial pneumonia and superimposed bacterial infections, both of which can be fatal[2]. SARS-CoV-2, like SARS-CoV, is thought to bind to the angiotensin-converting enzyme 2 receptor, which is highly expressed in the respiratory tract and so causes most tissue damage [3-5]. GI involvement, on the other hand, might occur before respiratory symptoms appear, and patients may experience abdominal pain, nausea, and diarrhoea as a result [4]. Furthermore, liver impairment can occur in a large number of people, especially those with a more serious illness. [6].

COVID-19 can manifest itself in a variety of ways, ranging from minor symptoms like a sore throat and a loss of smell or taste [6] to life-threatening disease. In addition to respiratory tract involvement, other organ problems such as acute kidney injury, liver damage, cerebrovascular stroke, and gastroenteritis have been recorded [7-8]. Although the liver has been linked to COVID-19 infection in adults, the true prevalence of hepatic abnormalities, the kind of liver enzyme derangement, and its relationship to outcomes are unknown[9-11].

Patients with COVID-19 have varying degrees of liver damage and function. More than a third of COVID-19 patients have a liver function test abnormalities. The majority of infected patients had mild-to-moderate elevations in serum alanine amino transferase (ALT) or aspartate amino transferase (AST); one patient had substantially elevated serum amino transferases (ALT of 275 U/L, AST of 212 U/L).Total bilirubin (reference range: 5.1-20.5 mol/L) and alkaline phosphatase (reference range: 36-92 units/L).

The purpose of this study was to summarise the clinical characteristics of a COVID-19 patient cohort admitted to the COVID unit, with an emphasis on liver injury and its association to clinical outcome. We examine liver injury in covid-19 patients at the government medical college and hospital.

Methods and Materials

All the Patients were admitted between june 2021 to August 2021 in Covid ward at Govt. medical college and hospital, Ambikapur, Chhattisgarh. India. Present study was divided into two groups.

Group-I: Female COVID Positive Patients -25.
Group-II –Male COVID positive Patients -25.

The demographic and clinical information for these patients was gathered from electronic hospital records and anonymized before being placed into a spreadsheet. Relevant data included sex, age, smoking status, BMI, alcohol intake, previous medical history, and the clinical description of COVID-19 at the start. We used the local laboratory reference level of normalcy as a cut-off for all laboratory data required for clinical reasons at the time of admission (first time point). Patients with diabetes mellitus, liver illness, lupus nephritis, acute sickness, or respiratory diseases were eliminated due to a lack of clinical or laboratory evidence. None of the patients had previously taken antioxidant supplements.

Results

Over the study period, 215 patients were admitted to the covid unit. Of these, 40 patients investigated for clinical suspicious for Covid-19, but with no evidence of SARS-CoV-2 in the collected biological specimens, were excluded from the study. In that 20 were female and 20 were male age in between 30-82, a definite diagnosis of COVID-19 was made on the basis of a SARS-CoV-2-positive nasopharyngeal swab. In three patients, SARS-CoV-2 was detected only through bronchoalveolar lavage. Table 1:Shows 20 female patients LFT values. Table 2:Shows 20 male patients LFT values.

Table 1:Shows 20 male patients LFT values.

S. N.	Name	Sex	Age	T.B.	D.B	I.B.	TP.	ALb	Glub	AP	OT	PT
1	Himanshi	F	28	0.9	0.3	0.6	5.5	3.5	2.0	106	45	42
2	Anita Yadav	F	21	1.8	0.6	1.2	5.6	3.0	2.6	92	48	40
3	Kaishliya Nai	F	32	0.5	0.2	0.3	5.2	3.0	2.2	42	26	24
4	Vidyawati	F	56	0.8	0.5	0.3	5.3	3.1	2.2	82	38	43
5	Bishun Bai	F	60	0.9	0.5	0.4	4.6	3.4	3.2	96	42	40
6	Lalita	F	19	1.4	0.5	0.9	6.3	3.2	3.1	81	42	31
7	Devika kumari	F	45	0.8	0.5	0.3	6.2	4.6	2.6	91	37	29
8	Kithun	F	38	0.6	0.3	0.3	6.2	2.7	3.5	142	24	20
9	Salgoo	F	50	2.5	1.6	0.9	7.7	4.6	3.1	162	83	86
10	Ram bai	F	27	0.3	0.1	0.2	6.0	3.4	2.6	165	65	51
11	Nanki	F	21	0.4	0.1	0.3	6.8	3.2	3.6	62	37	25
12	Santoshi Rajwade	F	23	0.3	0.4	0.2	6.2	3.0	3.2	82	15	16
13	Dham soni Rani	F	35	1.0	0.3	0.6	7.0	3.4	3.6	86	47	42
14	Veronica minj	F	33	0.7	0.3	0.4	5.7	3.0	2.7	96	14	12
15	Sundari	F	50	0.6	0.2	0.3	5.6	3.4	2.2	56	25	22
16	Penku	F	36	0.4	0.2	0.2	7.8	4.3	3.5	62	15	13
17	Sarju soni	F	73	0.6	0.3	0.3	5.6	3.2	2.4	142	49	42
18	Sahida	F	21	0.7	0.3	0.4	6.6	3.5	3.1	44	28	24
19	Durgawati	F	33	0.6	0.2	0.4	6.4	3.0	3.4	106	40	63
20	Santoshi	F	22	0.6	0.3	0.3	6.7	4.0	2.7	98	49	37

Table 2:Shows 20 male patients LFT values

S.N.	Name	Sex	Age	T.B.	D.B	I.B.	TP.	ALb	Glub	AP	OT	PT
1	Dil Kumar	M	36	0.5	0.2	0.3	6.2	3.1	3.1	127	275	212
2	Ram kumar	M	70	0.8	0.5	0.3	5.6	3.4	2.2	97	80	83
3	Maniyaram	M	52	0.6	0.2	0.4	5.2	3.2	2.0	86	42	40
4	Lakshman	M	81	0.9	0.4	0.5	6.0	3.2	2.8	92	75	96
5	Snil	M	19	0.3	0.6	0.2	7.2	3.4	3.8	84	29	35
6	Rampal ram	M	57	0.6	0.1	0.2	5.6	3.4	2.2	54	18	15
7	Mahesh	M	61	1.8	0.3	0.3	7.0	3.2	3.8	83	20	12
8	Ram Kumar	M	70	0.9	0.8	1.0	7.5	3.5	4.0	126	243	210
9	Banarsi lal	M	62	0.6	0.5	0.4	6.4	3.2	3.2	88	48	44
10	Banarsi	M	46	1.8	0.3	0.3	5.5	3.5	2.5	88	42	40
11	Umesh	M	36	0.6	0.8	1.0	7.5	3.6	3.9	128	56	54
12	Rup narayan	M	42	0.6	0.3	5.1	3.9	2.2	1.7	95	44	26
13	Ramjan khan	M	56	0.7	0.2	0.4	6.6	4.0	2.6	55	75	83
14	Vishwajeet	M	70	4.3	0.3	0.4	5.8	2.9	2.9	180	82	87
15	Ram	M	63	0.6	3.1	1.2	5.7	2.4	3.3	186	236	102
16	Suneha Ravi	M	45	0.4	0.2	0.4	7.6	3.0	4.6	65	32	25
17	Munna	M	32	2.1	0.2	0.2	6.9	3.0	3.9	120	146	124
18	Samsul	M	28	0.9	0.6	1.7	7.8	3.8	4.0	96	44	45
19	Ajit	M	58	0.4	0.4	0.5	6.8	3.6	3.2	92	38	35
20	Naresh	M	36	0.4	0.2	0.2	5.4	2.7	2.7	62	31	26

Discussion

SARS-CoV and its most recent version, SARS-CoV-2, have been identified as highly pathogenic human coronaviruses that cause respiratory, intestinal, hepatic, and neurological diseases [12]. The genetic sequence of SARS-CoV-2 is 79.6 percent to 82 percent similar to that of SARS-CoV. ACE2 is known to be used as a cell entrance receptor by SARS-CoV and SARS-CoV-2 [13]. Despite the fact that ACE2 expression is significantly higher on bile duct cells than on liver cells, ACE2 has been found to be abundantly expressed on hepatic endothelial cells, suggesting that the liver could be a potential target for SARS-CoV and SARS-CoV-2 [14, 15]. Individuals infected with human corona viruses, such as the old SARS-CoV [18, 19] and the current SARS-CoV-2, have been found to have varied degrees of hepatic damage in numerous studies. Previous investigations [17,20] lacked comprehensive liver function test data, dynamic changes in these parameters, or comparisons of these measures across different time periods of SARS-CoV-2 shedding, therefore the link between SARS-CoV-2 and liver injury remains unknown.

COVID-19 patients are admitted to the COVID ward, where their clinical condition and liver function decline are monitored. The bulk of the patients were older men who were non-smokers and non-drinkers, as we discovered. Cough, fever, and dyspnea were the most common symptoms, but gastrointestinal indications were unusual, and some people were asymptomatic. After excluding the few patients with established chronic liver disease, we noticed that half of the patients had increased ALT, AST, A.P, or T.B levels. In the context of an acute respiratory distress syndrome, a single case of acute liver failure was also observed.

Conclusion

To summarise, patients with COVID-19 in Ambikapur, Chattisgarh, had a significant rate of abnormal liver function tests, which was linked to poorer outcomes when they developed severe acute respiratory distress syndrome. Finally, we discovered that whereas SARS-CoV-2 does not cause direct ALT and AST increases, it can cause TBIL and A.P (mainly direct bilirubin) elevations, which indicate bile duct excretion impairment. In the future, more large-scale, prospective validation studies of the link between SARS-CoV-2 infection and liver injury would be needed.

Conflict of Interest: Nil
Source of Funding: Self/Diagnostic kits are provided by institution as on complimentary basis for research.
Ethical Clearance No.: No.IEC/GMC/2375/2021

References

1. WHO Director-General's opening remarks at the media briefing on COVID-19. (2020).
2. Velavan TP, Meyer CG: The COVID-19 epidemic . Trop Med Int Health. 2020, 25:278-280.10.1111/tmi.13383
3. WHO. Coronavirus disease 2019 (COVID-19): situation report, 73 . (2020).
4. WHO. Q&A on coronaviruses (COVID-19). (2020). http://www.emro.who.int/healthtopics/corona-virus/questions-and-answers.html.
5. Guan W-J, Ni Z-Y, Hu Y, et al.: Clinical characteristics of coronavirus disease 2019 in China . N Engl J Med. 2020, 328:1708-1720. 10.1056/NEJMoa2002032
6. Patel A, Charani E, Ariyanayagam D, Abdulaal A, Denny SJ, Mughal N, Moore LSP: New-onset anosmia and ageusia in adult patients diagnosed with SARS-CoV-2 infection. Clin Microbiol Infect. 2020, [Epub ahead of print]:10.1016/j.cmi.2020.05.026
7. Huang C, Wang Y, Li X, et al.: Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020, 395:497-506.
8. Li LQ, Huang T, Wang YQ et al (2020) 2019 novel coronavirus patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis. J Med Virol 92:577–583
9. Chen T, Wu D, Chen H et al (2020) Clinical characteristics of 113 deceased patients with coronavirus disease 2019: retrospective study. BMJ (Epub ahead of print)

10. Wang Z, Yang B, Li Q, Wen L, Zhang R (2020) Clinical features of 69 cases with coronavirus disease 2019 in Wuhan, China. ClinInfect Dis (Epub ahead of print)
11. Jia HP, Look DC, Shi L et al (2005) ACE2 receptor expression and severe acute respiratory syndrome coronavirus infection depend on differentiation of human airway epithelia. J Virol79:14614–14621.
12. World Health Organization.Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected. January 28, 2020. Accessed 15 Aug 2021.
13. Lan L, Xu D, Ye G, Xia C, Wang S, Li Y, et al. Positive RT-PCR test results in patients recovered from COVID-19. JAMA. 2020;323(15):1502–3.
14. Villar J, Pérez-Méndez L, Blanco J et al (2013) A universal definition of ARDS: the PaO2/FiO2 ratio under a standard ventilator setting—a prospective, multicenter validation study. Intensive Care Med 39:583–592.
15. Zhang S, Hu B, Xu J, Ren Q, Wang L, Wang S (2019) Influenza A virus infection induces liver injury in mice. Microb Pathog 137:103736.
16. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020;395(10223):507–13.
17. Akilli NB, Yortanlı M, Mutlu H et al (2014) Prognostic importance of neutrophil-lymphocyte ratio in critically ill patients:short- and long-term outcomes. Am J Emerg Med 32:1476–1480.
18. Rosenbaum L (2020) Facing Covid-19 in Italy—ethics, logistics,and therapeutics on the epidemic's front line. N Engl J Med 382:1873–1875.
19. Emanuel EJ, Persad G, Upshur R et al (2020) Fair allocation of scarce medical resources in the time of Covid-19. N Engl J Med 382:2049–2055.
20. Truog RD, Mitchell C, Daley GQ (2020) The toughest triage allocating ventilators in a pandemic. N Engl J Med 382:1973–1975.