بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

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PREVALENCE OF ABNORMAL LIVER FUNCTIONS IN COVID-19 PATIENTS

Thesis

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List of Abbreviations

Abb.	Full term
2019-nCoV	2019 New Corona Virus
AAT	Alpha-1-Antitrypsin Deficiency
AAT	α 1 -Antitrypsin
ACE2	Angiotensin-Converting Enzyme 2
ACLF	Acute-on-Chronic Liver Failure
ALP	Alkaline Phosphatase
ALT	Alanine Transaminase
ALT	Alanine Aminotransferase
ARDS	Acute Respiratory Distress Syndrome
AST	Aspartate Aminotransferase
CMV	Cytomegalovirus
CoV	Corona Virus
COVID-19	Corona Virus Disease 2019
CRP	C-Reactive Protein
CRS	Cytokine Release Syndrome
CSF	Colony-Stimulating Factor
CT	Computed Tomography
CYP 3A4	Cytochrome P450
DILI	Drug Induced Liver Injury
DILI	Drug-Induced Liver Damage
EUA	Emergency Use Authorization
FNH	Focal Nodular Hyperplasia
FXR	Farnesoid X Receptor
GGT	Gamma Glutamyl Transferase
GM	Granulocyte-Macrophage
HS	Highly Significant

List of Abbreviations (Continued)

Abb.	Full term
ICU	Intensive Care Unit
IP-10	Interferon-γ Inducible Protein 10
LAMP	Loop-Mediated Isothermal Amplification
LDH	Lactate Dehydrogenase
MCP-1	Monocyte Chemoattractant Protein 1
MERS	Middle East Respiratory Syndrome
MIP-1α	Macrophage Inflammatory Protein 1-α
NASH	Non-Alcoholic Steatohepatitis-Related Liver Fibrosis
NS	Non Significant
PBC	Primary Biliary Cirrhosis
PCR	Polymerase Chain Reaction
P-gp	P-glycoprotein
PSC	Primary Sclerosing Cholangitis
RAS	renin-angiotensin system
RR	Respiration Rate
rRT	Real-Time Reverse Transcription
RT	Reverse Transcription
S	Significant
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome Corona Virus 2
TBIL	Total Bilirubin
TMA	Transcription-Mediated Amplification
TNF-α	Tumour Necrosis Factor-α
ULN	Upper Limit Unit of Normal
WHO	World Health Organization

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INTRODUCTION

Corona viruses are a family of viruses that are known to cause both respiratory and intestinal diseases in Various animal species and humans ***(Dong et al., 2019).*** These viruses tend to target the upper respiratory tract, causing Anywhere from moderate to severe illnesses, such as the cold or in more extreme cases, pneumonia. To date, 7 human corona viruses have been identified, including the 3 epidemic viruses of severe acute respiratory syndrome (SARS)-CoV, middle east respiratory syndrome (MERS)-CoV and the newest, severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) ***(Niu et al., 2016).***

In December of 2019, a series of pneumonia cases of unknown origin began to spread in the central city of Wuhan, China. Now identified as SARS-CoV-2, the virus had gone on to infect more than 300,000 people Worldwide by March 2020 ***(Jia et al., 2019).***

The corona virus disease (COVID-19) has been labelled a pandemic by the World Health Organization (WHO) having led to thousands of deaths and hospitalizations worldwide.

While most COVID-19 cases have been identified as mild, more extreme diagnoses have led to respiratory failure, septic shock, and/or multiple organ dysfunction ***(Wu and McGoogan, 2020).***

In symptomatic patients, the clinical manifestations of the disease usually present as fever, cough, fatigue and other signs of respiratory tract infections ***(Chen et al., 2020; Wang et al., 2020)***. In severe cases, individuals elicit symptoms of pneumonia with abnormal chest CT, associated with complications of severe acute respiratory distress. Syndrome, acute cardiac injury, kidney failure, and eventually death.

Liver impairment has been reported as a common clinical manifestation in patients with SARS-COV infection, even if not a prominent feature of the illness ***(Humar et al., 2004; Chan et al., 2004).*** In the novel epidemic SARS-CoV-2, it is still unclear how significant liver impairment is. In the present study, we sought to analyse liver function changes (AST, ALT, Bilirubin, ALBUMIN) and evaluate its relationship with the disease progression in COVID-19 patients.

Aim of the Study

To evaluate the incidence of concurrent elevation of liver function tests (AST, ALT, Bilirubin), decrease albumin, examine dynamic changes of it and its relationship with disease throughout the course of COVID-19 patients.

CHAPTER (1): COVID-19 THE NOVEL VIRUS

Corona virus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). The first case was identified in Wuhan, China, in December 2019. The disease has since spread worldwide, leading to an ongoing pandemic ***(Vaira et al., 2020).***

Symptoms of COVID-19 are variable, but often include fever, cough, fatigue, breathing difficulties, and loss of smell and taste. Symptoms begin one to fourteen days after exposure to the virus. Of those people who develop noticeable symptoms, most (81%) develop mild to moderate symptoms (up to mild pneumonia), while 14% develop severe symptoms (dyspnea, hypoxia, or more than 50% lung involvement on imaging), and 5% suffer critical symptoms (respiratory failure, shock, or multiorgan dysfunction). Older people are more likely to have severe symptoms. At least a third of the people who are infected with the virus remain asymptomatic and do not develop noticeable symptoms at any point in time, but they still can spread the disease. Around 20% of those people will remain asymptomatic throughout infection, and the rest will develop symptoms later on, becoming pre symptomatic rather than asymptomatic and therefore having a higher risk of transmitting the virus to others. Some people continue to