Study the Correlation between covid-19 infection and chronic disorder

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Abstract

The significant of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that started in China highly risky for human live. The symptoms that describe Coronavirus Disease 2019 include asymptomatic, moderate, or severe pneumonia. (COVID-19). People with COVID-19 who also have diabetes, COPD, CVD, hypertension, cancer, HIV, and other comorbidities could be in danger of dying. SARS-CoV-2 employs the ACE-2 receptors on the host cell's surface to enter the cell. Increased ACE-2 receptor expression and proportion converses release are associated with several comorbidities, which facilitate viral entry into host cells. The comorbidities, which are closely connected to severe morbidity and mortality, cause the COVID-19 patient to enter a life-long cycle of infectious disease. Comorbid patients require special attention and precautions, as well as extra measures. The study's goal is: The current study were focused to examine the association between chronic illnesses and poorer COVID-19 infection outcomes (death and ICU hospitalization) as well as how chronic illnesses alter an individual's assessment of their own risk for these outcomes. Patients and procedures: Information about each of the 15000 COVID-19 patients was entered into a questionnaire. This model covered chronic illnesses such as respiratory, cardiovascular, cancer, renal, and stomach ailments. A few documents have been found that discuss the connection between COVID-19 and comorbidities; however, this study shows the wider range of comorbidities that COVID-19 patients deal with. Conclusions: Males are more likely to have Covid-19 (60%) than females (40%). With age comes a rise in the Covid-19. The COVID-19 recorded the highest percentage of infections in individuals with cardiovascular illnesses (53.3% and 15.7%).

Keywords: COVID-19, Diabetes, Chronic obstructive pulmonary disease, cardiovascular diseases, renal disease

1. Introduction

SARS-CoV-2 is the virus that causes COVID-19, a lung disease that has taken in the globe. Yet, according to statistics, by early December 2020, there were over 1.5 million recorded fatalities and a total of 68 million infections caused by SARS-CoV-2 globally (WHO Coronavirus (COVID-19) Dashboard | WHO Coronavirus (COVID-19) Display with Vaccination Information, no date; Hui et al., 2020). Numerous researches has linked persistent illnesses, such as cardiac and respiratory illnesses to more severe results from infections. It was evident that additional research was required in order to better comprehend the virus's epidemiological studies, including the discovery of indicators of risk for death or serious illness, given COVID-19's rapid spread and high death rate among people with unstable conditions (Lipsitch, Swerdlow, and Finelli, 2020). In December 2019, the first information about COVID-19, a disease linked to SARS-CoV-2, was released in China. The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020, due to its continued expansion. Nearly thirty-four million cases and almost one million fatalities had been recorded worldwide as of the third of October in 2020. The majority of COVID-19 cases result in fever and pneumonia-like symptoms of breathing. Digestive problems, cutaneous disorders, heart attacks, and mental health issues are some of the less common complaints reported. (Maury *et al.*, 2021) It has been demonstrated revealed the new

virus can enter people's airways and is an encapsulated, a single-strand positive-strand RNA virus. More emergency events may occur since these infectious viruses, like SARS-Covid in 2002, and MERS-Covid in the year 2012, might infect people from a range of species of animals (Weiss and Navas-Martin, 2005; Ren, Gao and Chen, 2020). The relationship between biological gender the risk of getting sick and the degree of illness is not well understood. The immune system reaction is a prime illustration. Males tend to be more prone to create the cytokine storm linked to poor COVID-19 outcomes, even though generally, females have a greater immune system reaction. 2020's Haitao et al.

2. Effect of COVID-19 on Diabetes

Patients with diabetes have a lower ability for phagocytic cells, which makes them more vulnerable to infection. Furin, a type 1 membrane-bound protease, is overproduced in diabetics. The elevated furin levels activate the SARS-CoV-2 spike (S) protein, which then attaches to ACE-2 receptors. This pre-activation of the S protein allows the virus to enter the cell and evade recognition by the human immune system. In diabetics, the virus's easy entrance creates a potentially deadly scenario. (Kulcsar et al., 2019).

Effect of COVID-19 Obesity
One of the fewer-known diseases linked to COVID-19 infections is weight. People who are obese have a 47.6% increased risk of infection, and 68.4% of these individuals need urgent breathing. A decrease in oxygen saturation in the blood is linked to being overweight (body mass index, 30 kg/m2) because of insufficient airflow at the lowest point of the lung. (Grasselli and colleagues, 2020; Zhang et al., 2018)

Effect of COVID-19 on COPD
Up 15 to 20 percent of COVID-19 patients, oxygen deprivation sets up, requiring the application of ventilation. Of all COVI-19 patients transferred to the ICU, 50–52.3 % had COPD, which led to a high fatality rate. (Liu & colleagues, 2020; Qiu & colleagues, 2020)

Effect of COVID-19 ON Asthma

People with asthma are more vulnerable to viral infections. But if treatment is not received, these infections may worsen to the point where they produce alarming symptoms. The severe symptoms of MERS (13%) and SARS (1.4%) were associated with asthma and other chronic respiratory diseases. (Yin and Wunderink, 2018; Contoli et al., 2006)

Effect of COVID-19 ON Hypertension

In 23 percent of hypertension COVID-19 patients in China, 6% CFR was noted. Treatments for high blood pressure frequently involve the use of angiotensin receptor blockers (ARBs) and angiotensin-converting enzyme (ACE) inhibitors. When used in high dosages, these inhibitors raise the risk of contracting SARS-CoV-2. The infection is more susceptible when there is an increase in receptor cell expression. (L. Y. Ma et al., 2020; Fang, Karakiulakis, and Roth, 2020)

ACE inhibitors and angiotensin-converting enzyme 2 (ARBs) both boost adrenalin-converting enzyme 2 (ACE 2), which reduces the inflammatory effects caused by angiotensin II on the body. As a result, the most common severe outcomes of COVID-19 are lung damage, kidney injury, and respiratory distress syndrome; moreover, ACE-2 provides protection against these outcomes. It is advised to utilize ACE inhibitors and ARBs to maintain normal blood pressure, even though it is uncertain if doing so is beneficial or harmful. (Schifrin and associates, 2020)

Effect of COVID-19 ON CVD

There is a significant correlation between SARS (eight percent) and MERS (eight percent) and CVD (30 percent). Acute coronary syndrome is more likely to occur in patients with coronary artery disease during a viral infection. The rise in cardiac demands brought on by this condition might lead to damage to the heart or stroke. As is usual in individuals with cardiovascular disease, the majority of COVID-19 patients had

compromised immune systems. (Yang and colleagues, 2020; Bonow et al., 2020)

Effect of COVID-19 ON Liver of diseases

There is a distinct connection between abnormal hepatic enzyme production and coronavirus infection. Liver cell receptors for ACE-2 facilitate the entrance of SARS-CoV-2 into liver cells. In the latter phases of the virus, 29% of COVID-19 patients have liver damage and severe complications. Changes in blood chemistry usually go away without seriously harming the liver. The majority of the time, liver damage shows up as a transient elevation in ALT and AST levels without hepatocellular failure; nevertheless, in extreme cases, this may be harmful. Jin et al., 2020; Chen et al 2020;

Effect of COVID-19 on Malignancy

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Effect of COVID-19 on renal diseases

Because SARS-CoV-2 directly damages cells or induces sepsis, it triggers a flood of cytokines in the kidneys. In 3–9% of COVID-19 patients, acute kidney injury (AKI) was found. Chinese researchers have identified SARS from a urine sample of an infected patient. Patients who have elevated blood urea nitrogen levels experience 26.7% hematuria, 34% albuminuria, and 63% proteinuria. (Li and others, 2020; Sun and others, 2020)

The Using Methods Due to the Patients

The present investigation was carried out from January to December 2020 in the Diyala cities of Baquba, AL-Khalis, AL-Moqdadia, Baladrose, and Khanaqin. Diyala Health Organization provides a total of fifteen thousand COVID-19 patients for collection. A survey was developed and distributed to fifteen thousand COVID-19 patients, containing personal data on each individual. Chronic illnesses were incorporated in this framework (respiratory, cardiovascular, cancer, renal, and gastrointestinal ailments).

The analysis of a Statistic

Yet, the Chi-squared (X2) test was used for comparing proportions in the data gathered for the present study. For testing, a significance level of α=0.05 was used. Programs for analyzing current information (SPSS v.22)

The Results

Our study's results indicate that the proportion of men (60.0%) is higher than that of women (40.0%), with a significant difference ($p<0.05$). Our research showed that the age groups (1–10, 11–20, and > 60) recorded the lowest percentage of infection (2%, 3.3%, and 6.7%), whereas the age groups (31–40 and 41–50) years recorded the greatest percentage of infection (33.3% and 26.7%).

Table 1:- demonstrate a distribute of COVID-19 patients due to sex and age periods.

Total= 15000		N	%
Sex	Male	9000	**60%**
	Female	6000	**40%**
Age periods (years)	1-10	300	**2.0%**
	11-20	500	**3.3%**
	21-30	2200	**14.7%**
	31-40	5000	**33.3%**
	41-50	4000	**26.7%**
	51-60	2000	**13.3%**
	>60	**1000**	**6.7%**

4. COVID-19 and chronic diseases

Depending on Diyala cities, our study revealed the COVID-19 patients no have chronic diseases and patients have cardiovascular diseases recorded highest percentage of infection (53.3% and 15.7%), while the patients have cancer disease recorded lowest percentage of infection.

Table (3): Correlation between COVID-19 patients according to sex and age& COVID-19 patients according to chronic diseases

5000		n	%
diseases	Diabetic mellitus	750	**5%**
	Cardiovascular diseases	235	**15.7%**
	Renal diseases	180	**12%**
	Respiratory diseases	105	**7%**
	Cancer	200	**1.3%**
	Stomach diseases	850	**5.7%**
No		**8000**	**53.3%**

Parameters	Pearson-correlation	p-value	Significa
COVID-19 Patients according to sex and age periods.	0.38	0.03	**Significa**
COVID-19 patients according to chronic diseases			

We note from the table (3) that there is a negative inverse relationship between COVID-19 patients according to sex and age& COVID-19 patients

according to chronic diseases and The Pearson correlation coefficient was 038. , and the value of the statistical significance 0.03.

Plot of COVID-19 patients; COVID-19 patients according to
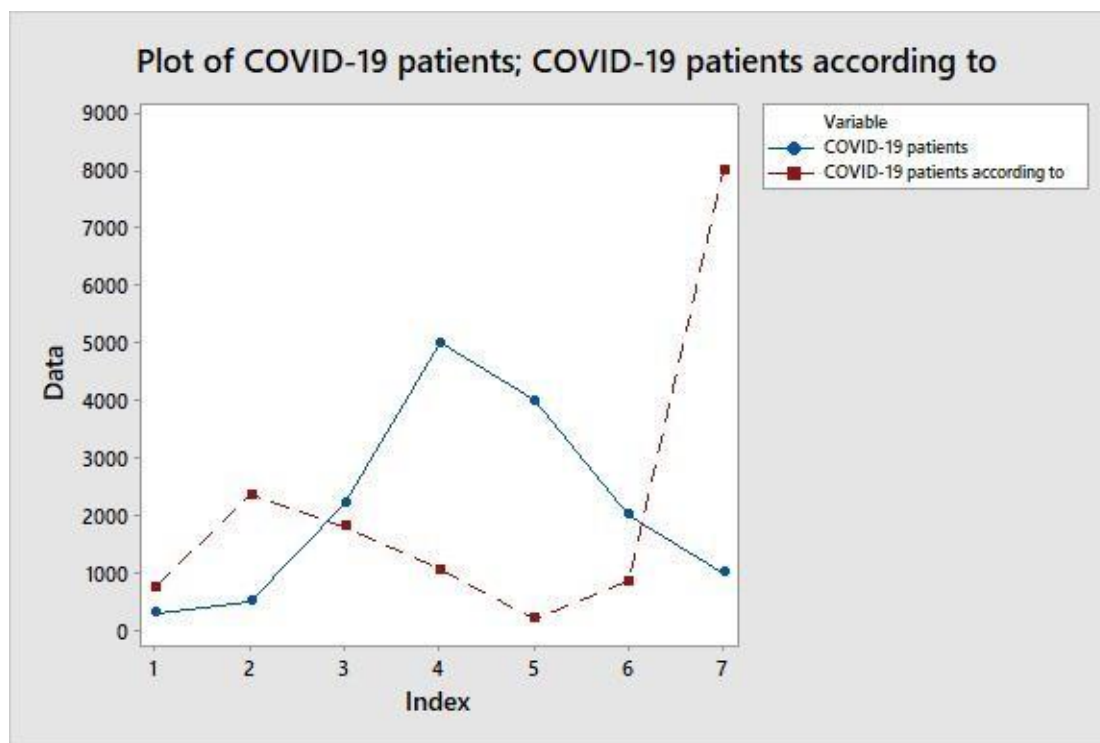
Discussion

There is a substantial correlation between COVID-19 and chronic diseases such diabetes, cancer, and heart, kidney, and lung issues. This was particularly noticeable for respiratory, cardiovascular, and renal problems when looking just at COVID-19 patients that needed to be hospitalized. However, over half of people under 40 (26.7%) have chronic illnesses, which makes them especially vulnerable to COVID-19 causes due to diminished immunity and aging-related frailty (Yao et al., 2011).

The conceivable danger of severe COVID-19 illness was effectively communicated by the media, medical societies, public health institutes, health authorities, and patient organizations. The risk of infection supplied by many chronic conditions, especially among the elderly, was not as effectively communicated. Therefore,

regardless of how active or well-managed their condition is or how they feel, it is not unexpected that older patients with one of the illnesses under investigation were more concerned about the risk of having severe effects following COVID-19 (Laires et al., 20121). Poorer COVID-19 readings have been observed to be positively correlated with respiratory, cardiovascular, and renal problems in this study.

A variety of characteristics are shared by both infectious and chronic illnesses, such as an inflammatory state and a compromised immune system, which may raise the chance of disease consequences for individuals (Yang et al., 2020). This is particularly true for cardiovascular conditions, which have been thoroughly investigated elsewhere in relation to COVID-19. However, reduced lymphocyte numbers and function due to renal disease failure puts the

patient at risk for life-threatening infections and resulting in immunodeficiency. The patient's lung function is impaired in addition to having underlying respiratory disorders like COPD, which makes them less able to fend off viral infections and increases their risk of developing life-threatening illnesses (Zheng et al., 2020).

5. Conclusions

The percentage of males (60%) with Covid-19 is more than females (40%). 2- The Covid-19 increases with age progression. The COVID-19 scored highest percentage in patients have cardiovascular diseases recorded highest percentage of infection (53.3% and 15.7%).

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