Effect of COVID-19 Virus on Biomass Index of Infected Patients

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ABSTRACT
This work is the first study about the pandimic COVID-19 its effects on biomass index of recovered patients from COVID-19. Our study shows that the Corona virus causes irregular weight gain in the recovered individuals of the Corona virus at statistically < 0.001. We found that the corona virus infection rate of males (61%) is much higher than the rate for females (39%), while patients (less than 40) years of age were higher significantly compared other ages at (Chi-square: 9.665, p- value: 0.002).

INTRODUCTION

At the end of December 2019, a new coronavirus (CoV) was reported as a microorganism that triggered an outbreak of disease in the Chinese city of Wuhan and was officially named COVID-19 by (WHO). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and subsequent coronavirus disease 2019 (COVID-19) is referred to as coronavirus due to respiratory symptoms. WHO announced COVID-19 to be a six public health emergency of global outrage [1]. There are many hundreds of viruses in the coronavirus family. Although only six strains (229E, NL63, OC43, HKU1, SARS-CoV and MERS-CoV) have been reported to cause mild to extreme respiratory disease in humans[2]. Human coronaviruses comprises a broad family of Coronaviruses which are non-segmented, encapsulated, positive-sense single-strand ribonucleic acid (RNA) viruses[3]. Corona virus can infect animals and also humans, causing respiratory, hepatic, and neurologic diseases [4].

Extreme acute respiratory syndrome coronavirus recorded in November , 2002 and Middle East pulmonary syndrome coronavirus (MERS-CoV) recorded in September 2012, It emerged from animal reservoirs in the human population and caused severe respiratory diseases with high death rates[5]. Once again a novel acute respiratory syndrome of coronavirus-2 has arisen and triggered an infectious disease called coronavirus illness 2019 (COVID-19)[6]. The virus was first described and documented in December 2019 from Wuhan City of China[7]. Corona virus is extremely infectious, distributed over a limited period of time worldwide and announced a worldwide pandemic by the World Health Organization on 11, March, 2020[8].

Following an increase in the occurrence of the Coronavirus pandemic in China, it expanded rapidly throughout the world[9]. To date, more than 200 countries across the world have registered cases (COVID-19) that have seriously affected human life [10].

Although numerous excellent research publications have been published to resolve this new infection, however this research aims to provide a comparison among the biomass index of patients before and after their infection with the Coronavirus and study the relationship between age and gender in Anbar province.

MATERIALS AND METHODS
Collection of samples
One hundred samples were obtained from COVID-19 infected patients from Al-Anbar province over the period from August 2020 to December 2020. All of the samples were diagnosed by qPCR technique and covid 19 rapid test (bio-medomics). In this study, several factors such as gender, age, weight, hights were taken into consideration according to the ethics of scientific research.

Statistical analysis
All the data was analyzed with descriptive statistical analysis using SPSS software, version 25.0. In order to compare the different classes, we used chi-squared tests between age and gender of patients, on the other hand we used paired-samples T- test.

RESULTS

According to table 1, results showed a significant difference between gender and age of confirmed COVID-19 patients at $\chi2$: 9.665, p- value: < 0.01. On the other hand, our results showed that the males corona virus infection incidence (61%) is far more than the infected females with ratio of (39 %). patients (less than 40) years of age were higher significant compared with other ages.

Table 1: The relationship between gender.

Age * Gender Crosstabulation				Total
		Gender		
		Males	Females	
Age	less than 40	48	19	67
	more than 40	13	20	33
Total		61	39	100
Chi-square: 9.665 , p- value : 0.002				

Table 2: BMI of infected patients with COVID-19

Paired Samples Statistics				
parameters	Mean	N	Std. Deviation	Std. Error Mean
BMI2	26.283	100	±5.555	.555
BMI1	25.539	100	±5.350	.535
BMI: Biomass index, BMI1: biomass index of persons before infection, BMI2: biomass index of persons after infection				

According to table 3, results showed a significant difference between BMI1 (before infection) and BMI2(after infection) of confirmed COVID-19 patients at t value: 10.591, p- value: < 0.001.

Table 3: The difference between BMI1 and BMI2.

Correlation	Mean	Std. Deviation	Std. Error Mean	T	Significance
BMI1-BMI2	.744	±.702	.0702	10.591	.000

DISCUSSION

The epidemic of the new coronavirus emerged from the Hunan Fish Market in Wuhan, China, where bats, snakes and other animals are sold. Corona virus has transmitted rapidly around the world.

The first study in the world demonstrating the effect of the Corona virus on irregular weight gain in the recovery phase of the Corona virus through its effect on obesity hormones. It is worth noting that Corona virus affects the weight gain of people after the stage of recovery from this virus. In the current study, we found that BMI2 (after infection) in the infected individuals are higher than BMI1(before infection). Corona virus may affect all body systems, including hormones that increase weight. Food is not alone responsible for weight gain or loss, but there are other factors that control weight, including hormones that control weight gain in women and men. On the other hand, infection with the Corona virus may affect obesity hormones such as Ghrelin, leptin, estrogens, cortisol thyroids glands hormones.

The Ghrelin hormone is the hunger hormone, and it helps stimulate the appetite and deposit more fats, and if high levels of ghrelin are excreted from the stomach and intestines, weight gain occurs , while The hormone leptin is produced by the fat cells in the body and gives a signal to the brain to feel full, and excessive intake of processed food and fast foods, sweets and chocolate, the excess of fructose sugar is converted into fats in the liver and abdomen, and fat cells secrete leptin, and the fat accumulates and thus weight gain occurs. On the other hand, Cortisol is a steroid hormone produced by the adrenal gland and its secretion increases with feelings of anxiety, depression and tension, and its increased secretion leads to an increase in insulin secretion and thus fat deposition in the body. The thyroid gland produces calistonein, T4, and T3, these are very important in metabolism and growth, then leads to incrasing of weight.

New studies show that age, and gender are linked to the susceptibility of corona virus disease. In the country China, several studies have recorded that the rate of male infection is larger than that of female infection [11]. Gender differences play a significant role in the immune system and are controlled and respond to stimuli. Immunity responses in males are weaker than in females, leading to rapid clearance or reduction of virus load in females compared to males[12]. Consequently, the rate of male infection is higher than that of females with the Coronavirus, as in our research results.

CONCLUSION

In the current study, The COVID-19 pandemic is influenced by several factors such as age and gender which need to investigate in future. on the other hand, complications of infection with the Coronavirus is weight gain which occurs in the recovery phase of Corona virus infection. Researchers should be making effort to explain the causes behind the recorded increasing incidence of BMI among patients after corona virus infection.

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