Diagnosis of Coronavirus using Biochemical and Hematological Methods for Patients in Anbar Governorate

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Abstract

In view of the great importance of this virus and the major health problems it causes that may reach death and the importance of early diagnosis of this virus, which works to reduce deaths, this study came for the early diagnosis of this virus, as we relied on biochemical and blood methods for the speed of diagnosis and the low cost compared to the rest of the tests Where many tests were tested, including ferritin, LDH, and Di dimer, where there was a significant increase in the concentration of these tests compared to the control. No significant differences were observed between men and women. As for the hematological tests, which included WBC count, Neutrophiles, Lymphocytes. There is a significant decrease in the number of white blood cells and lymphocytes in comparison with the control. We conclude through the study that infection with Corona virus increases many biochemical and hematological variables, including a significant increase in ferritin, a significant increase in LDH and Di dimer, in addition to a decrease in the total number of white and lymphocytes

Keywords: *Toxicity; Corona virus, biochemical behaviors; hematological behavior; Health.*

Introduction

Coronaviruses are a crew of viruses that can reason ailments such as the frequent cold, extreme acute respiratory syndrome (SARS), and Middle East respiratory syndrome (MERS).[1,2] A new kind of coronavirus used to be determined after it used to be recognized as a reason of the unfold of a disorder that commenced in China in 2019. [3,4]The severity of COVID 19 signs and symptoms can vary from very moderate to severe. Some human beings may additionally improve solely a few symptoms, and some human beings may additionally no longer have any signs at all. Some humans can also trip a worsening of symptoms, such as worsening shortness of breath and worsening pneumonia, about a week after signs and symptoms begin. [5,6] Older humans are at a greater hazard of creating extreme COVID-19 symptoms, and that chance will increase as a individual get older. People with present continual scientific stipulations might also be greater probably to have extreme symptoms. An instance of a serious fitness situation that will increase your chance of growing extreme COVID-19. [7,8,9] The virus seems to unfold effortlessly between people, and scientists will proceed to find out extra about how it spreads. Data confirmed that it is unfold from man or woman to individual thru shut contact (within 6 feet, or two meters). The virus is unfold via respiratory droplets launched when an contaminated character coughs, sneezes, or speaks. This spray can be inhaled or bought into the mouth or nostril of any one close. [10] Although the signs of most human beings with Covid-19 vary from slight to moderate, the ailment can reason extreme clinical problems and lead to dying for some people. Older adults or these with current underlying clinical stipulations are extra probable to boost a serious case of COVID-19. [11] If you have a persistent circumstance

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and are at improved threat of creating extreme signs if you contract the infection, speak to your physician about extra approaches to shield yourself. [12]

Lab. Analysis

60 blood samples were collected from people suspected of being infected with the Coronavirus, divided into 30 samples from men and 30 samples from women, 30 samples were for people who were not infected with his control, and the tests were conducted.

Biochemical test

Biochemical assays included screening for ferritin, LDH, Di-dimer and Covid 19 IgM , IgG concentration. [13]

Hematological test

Hematological test included screening for WBC count ,Lymphocyte and Neutrophils by CBC Apparatus [14]

Result and Discussion

Table 1 Diagnosing corona virus using biochemical test

Descriptive Statistics				
Dependent Variable: concentration				
gender	**biochemical test**	**Mean**	**Std. Deviation**	**N**
male	ferritine	490.00	39.441	10
	LDH	609.00	51.951	10
	Di dimer	726.00	62.218	10
	Total	608.33	110.112	30
femal	ferritine	425.00	26.352	10
	LDH	524.00	39.215	10
	Di dimer	607.00	40.014	10
	Total	518.67	83.159	30
control	ferritine	135.00	14.337	10
	LDH	135.00	14.337	10
	Di dimer	135.00	14.337	10
	Total	135.00	13.834	30
Total	ferritine	350.00	159.374	30
	LDH	422.67	213.136	30
	Di dimer	489.33	262.953	30
	Total	420.67	221.094	90

Table 1 shows the diagnosis of Corona virus using biochemical methods. There was a significant increase in the concentration of ferritin, LDH, and Di-dimer, where the concentration of ferritin was 490 for men, 425 for women, compared to the control, 135, meaning there were significant differences between treatments and control, and LDH was 609 for men and 525. For women compared to control 135, meaning there are significant differences between treatments and control, as well as for Di-dimer, the concentration was 726 for men and 607 for women compared to control 135, meaning there are significant differences between transactions and control, there are no significant differences between men and women, but women were better compared to men

Table 2 ANOVA table for Diagnosing corona virus using biochemical test

Tests of Between-Subjects Effects					
Dependent Variable: concentration					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	4237380.000a	8	529672.500	379.073	.000
Intercept	15926440.000	1	15926440.000	11398.141	.000
gender	3792846.667	2	1896423.333	1357.221	.000
test	291386.667	2	145693.333	104.269	.000
gender * test	153146.667	4	38286.667	27.401	.000
Error	113180.000	81	1397.284		
Total	20277000.000	90			
Corrected Total	4350560.000	89			
a. R Squared = .974 (Adjusted R Squared = .971)					

Table 2 shows the analysis of variance. There are significant differences between all treatments compared to control, and there are no significant differences between men and women in all tests.

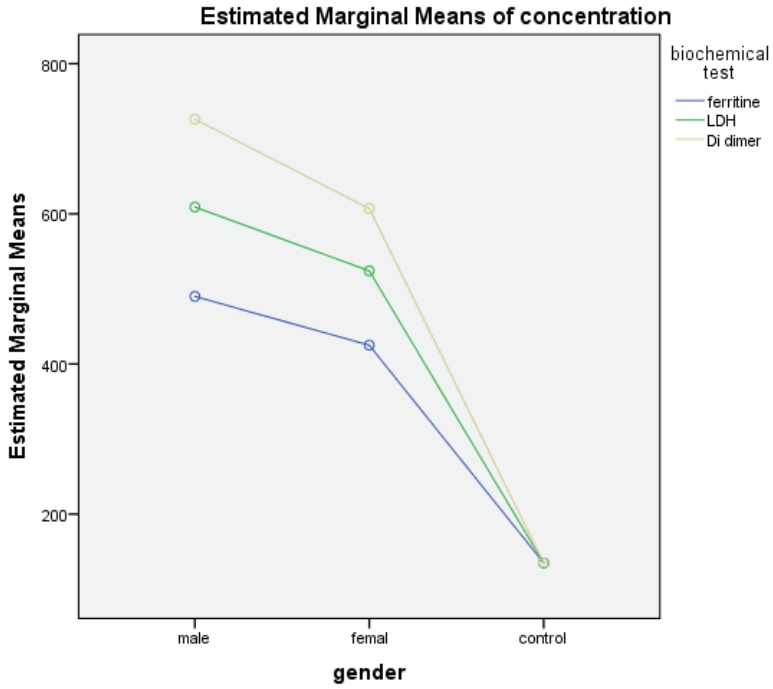

Figure 1 Diagnosing corona virus using biochemical test

Table 3 Diagnosing corona virus using Hematological test

Descriptive Statistics				
Dependent Variable: concentration				
gender	**hematological**	**Mean**	**Std. Deviation**	**N**
male	WBC count	4420.00	225.093	10
	Neutrophilis	1840.00	107.497	10
	Lymophocyte	760.00	84.327	10
	Total	2340.00	1568.571	30
femal	WBC count	4420.00	225.093	10
	Neutrophilis	1840.00	107.497	10
	Lymophocyte	760.00	84.327	10
	Total	2340.00	1568.571	30
control	WBC count	7630.00	2488.217	10
	Neutrophilis	3300.00	483.046	10
	Lymophocyte	1750.00	97.183	10
	Total	4226.67	2898.624	30
Total	WBC count	5490.00	2078.851	30
	Neutrophilis	2326.67	754.725	30
	Lymophocyte	1090.00	482.343	30
	Total	2968.89	2267.387	90

Table 3 illustrates the use of blood tests in the diagnosis of Corona virus, which included the total white blood cell count, the differential count of neutrophil and neutrophil white cells. It was observed through the table. In men and men 4420 compared with control 7630, as well as for lymphocyte white blood cells, where the number reached 670 compared with control 1750, meaning there are significant differences between the treatments and control, and there are no significant differences between men and women.

Table 4 ANOVA table for Diagnosing corona virus using Hematological test

Tests of Between-Subjects Effects					
Dependent Variable: concentration					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	398398888.900a	8	49799861.110	68.191	.000
Intercept	793287111.100	1	793287111.100	1086.254	.000
gender	71190222.220	2	35595111.110	48.741	.000
test	308960222.200	2	154480111.100	211.531	.000
gender * test	18248444.440	4	4562111.111	6.247	.000
Error	59154000.000	81	730296.296		
Total	1250840000.000	90			
Corrected Total	457552888.900	89			
a. R Squared = .871 (Adjusted R Squared = .858)					

Table 4, analysis of variance table, it was noticed that there were significant differences in the two blood cells and lymphocytes in the subjects compared with the control.

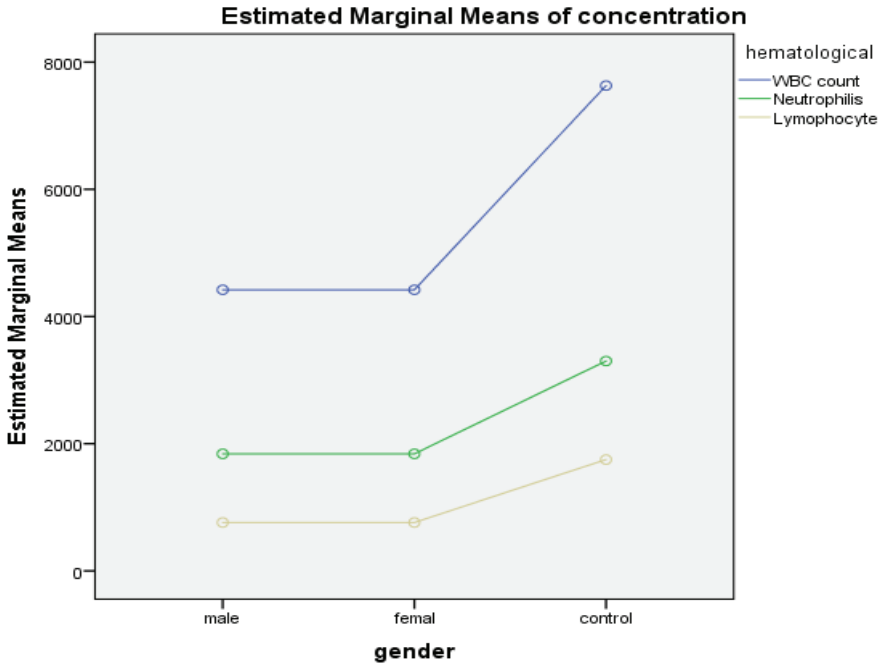

Figure 2 for Diagnosing corona virus using Hematological test

Consultation

We conclude through the study that infection with Corona virus increases many biochemical and hematological variables, including a significant increase in ferritin , a significant increase in LDH and Di dimer, in addition to a decrease in the total number of white and lymphocytes.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: None

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