

Lacticodeshydrogénase (LDH) and Ferréinémia, Biomarkers of Coronavirus disease (COVID-19)

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Research Article

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Background

Coronavirus disease (COVID-19) is caused by SARS-COV2 and represents the causative agent of a potentially fatal disease that is of great global public health concern [1-2]. It involves humans as well as animals and may cause serious damage to the respiratory tract, including the lung: coronavirus disease (COVID-19). This pathogenic virus has been identified in swabs performed on the throat and nose of patients who suffer from or are suspected of the disease [1]. Based on the large number of infected people that were exposed to the wet animal market in Wuhan City, China, it is suggested that this is likely the zoonotic origin of COVID-19 [2].

Keywords: Covi-19, Ferriinemia, LDH.

Introduction

The virus that causes COV-19 is spread mainly by droplets produced when infected person Coughs sneezes or expires. This droplet is too heavy to stay in the air and fall quickly to the ground or any nearby surface. People with Covi-19 have severe respiratory failure, or lack of oxygen, which involves an imbalanced cytoplasmic and mitochondrial metabolism (Effect Warburg), important activity of enzyme lacidideshydrogénase (LDH), production of acid lactic, muscular weakness on the one hand Ferritin is a protein that fixes iron (Fe) contributes to the oxygenation of blood and organs. The main role of iron is to transport and store the oxygen contained in the blood to the organs and muscles to human body. It is essential for the formation of hemoglobin protein found in red cells.

When COVI-19 infect the upper and lower respiratory tract it can cause mild or highly acute respiratory syndrome with consequent release of pro-inflammatory cytokines, including interleukin (IL)-1 β and IL-6. [3-7]. In this study, we attempted to evaluate the concentration of the enzyme lacidideshydrogénase, Ferriinemia and iron to investigate the anomalies affecting the anaerobic metabolism. In this respect, a retrospective case-control study conducted at the Tlemcen university hospital, biochemistry service (Algeria).

Materials and Methods

Twenty patients with Covi-19 and Twenty sex-matched control were recruited for a retrospective case-control study at the Tlemcen university hospital, biochemistry service (Algeria). Characteristics of Patients Covi-19 and Control (*Gender (M/F) 6/14; 9/11*)

Age (year) Control (48.4 \pm 4.37); Patients Covi-19 (55.68 \pm 3.68).

The circulating levels of Ferriinemia, LDH, Fer and CRP were evaluated in 20 patients with Covi-19 and 20 controls. The concentrations of studied parameters were measurement by Automated Biochemistry Analysis ADVIA. 1800. Siemens.

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Results

In this study, the circulating levels of LDH, Ferritinemia, Fer and CRP were evaluated in 20 patients with Covi-19

and 20 controls. Characteristics of Patients Covi-19 and Control are presented in Table1. The biomarkers are shown in Table2. The serum levels of Fer (Iron), Ferritinemia and LDH are show in Figures 1, 2 and 3 respectively. We note that correlation coefficient between the different biomarkers varies proportionally. (Table3.)

Variable	Controls	Patients
Gender(M/F)	6/14	9/11
Age(year)	48.4 ± 4.37	55.68 ± 3.68

Table1: Characteristics of Patients and Control Covi-19

Variable	Controls	Patients
Ferritinemia(ng/ml)	72.35 ± 12.02	896.79 ± 97.70
Fer(µg/dl)	85.15 ± 5.90	20.42 ± 1.54
LDH(u/l)	184.3 ± 9.72	366.32 ± 33.94
CRP (mg/l)	4.03 ± 0.30	67.54 ± 8.08

Table2: Levels of biomarkers in Covi-19 and Controls

Variable	Pearson	Spearman
LDH / Fer	-0.622	-0.734
LDH/ Ferritinemia	+0.742	+0.807
LDH/ CRP	+0.679	+0.711
Fer / Ferritinemia	-0.725	-0.808
CRP/ Ferritinemia	+0.697	+0.787
Fer/CRP	-0.655	-0.8011

Table3: Correlation Coefficient of biomarkers with Covi-19

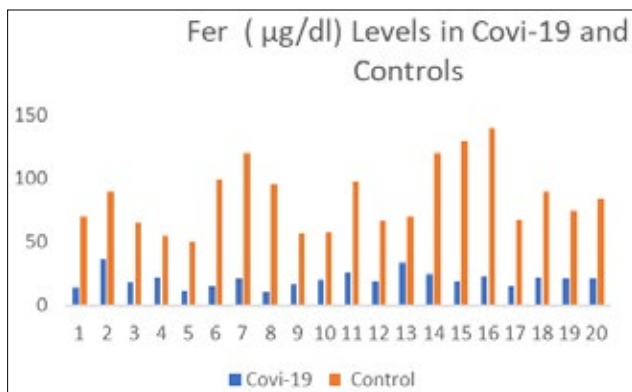


Figure 1: Fer Levels in Covi-19 and Controls. The variables are presented as mean ± standard error. $P > 0.005$.

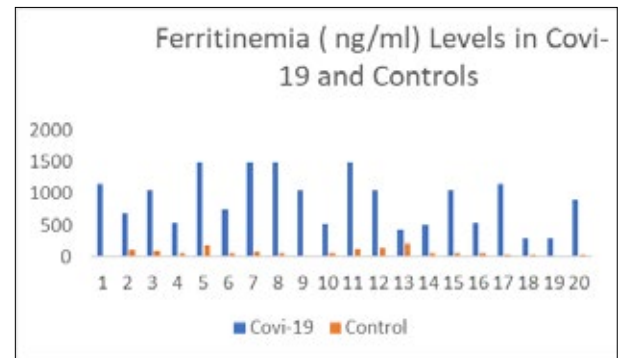


Figure 2: Ferritinemia Levels in Covi-19 and Controls. The variables are presented as mean ± standard error. $P > 0.005$.

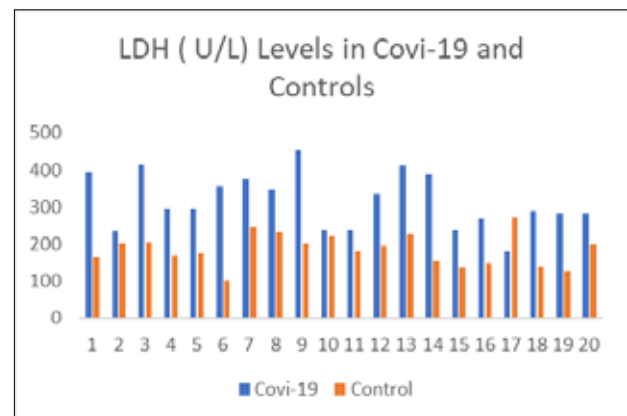


Figure 3: LDH Levels in Covi-19 and Controls. The variables are presented as mean ± standard error. $P > 0.005$.

The serum iron (Fer(µg/dl)) level is significantly decreased in Covi-19 than in control (20.42 ± 1.54 ; 85.15 ± 5.90). Additionally, the serum levels of Ferritinemia, LDH and CRP were significantly higher in Covi-19 than in Control. Ferritinemia(ng/ml) Control(72.35 ± 12.02) Patients Covi-19 (896.79 ± 97.70); LDH(u/l) (184.3 ± 9.72 , 366.32 ± 33.94); CRP (mg/l)(4.03 ± 0.30 , 67.54 ± 8.08).

Discussion

Covi-19 patients are usually exposed to potentially risk of mortality, maternal and neonatal consequences respiratory, renal problems and immunology disorder [7, 8]. The increase in Ferritinemia and decrease of Iron (Fe) represent an imbalance for oxygenation of cells and the destiny of pyruvic acid which will be transformed to lactic acid via lacticodeshydrogenase (LDH), (effect Warburg).

Conclusion

Our results show the importance of these parameters to identify people a risk these are a simple and quick analyzes for Covi-19. The indication to prevent infection is a supplementation on iron, trying to inhibit the enzyme LDH and to estimate ferritinemia.

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