Lacticodeshydrogénase (LDH) and Ferrétinémia, Biomarkers of Coronavirus Disease (COVID-19)

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Abstract
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. 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. 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.

Keywords: Covid-19 • Ferritinemia • 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 [1-4]. People with Cov-19 have severe respiratory failure, or lack of oxygen, which involves an imbalanced cytoplasmic and mitochondrial metabolism (Effect Warburg), important activity of enzyme Lacticodeshydrogénase (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)-1β and (IL)-6. [5].

In this study, we attempted to evaluate the concentration of the enzyme lacticodeshydrogénase, Ferritinemia 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 are presented in Table 1. The biomarkers are shown in Table 2.

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 Table 1. The biomarkers are shown in Table 2.

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)-1β and (IL)-6. [5].
Discussion

Cov-19 patients are usually exposed to potentially risk of mortality, maternal and neonatal consequences [7] respiratory, renal problems and immunology disorder [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 lacticodehydrogénase (LDH), (effect Warburg).

Conclusion

Our results show the importance of this parameters to identify people at risk these are a simple and quick analyzes for Cov-19.

The indication to prevent infection is a supplementation on iron, trying to inhibit the enzyme LDH and to estimate ferrinemia.

References


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Table 3. Correlation Coefficient of biomarkers with Covid-19.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pearson</th>
<th>Spearman</th>
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<tbody>
<tr>
<td>LDH/Fer</td>
<td>-0.622</td>
<td>-0.734</td>
</tr>
<tr>
<td>Ferritinemia</td>
<td>0.742</td>
<td>0.807</td>
</tr>
<tr>
<td>LDH/CRP</td>
<td>0.679</td>
<td>0.711</td>
</tr>
<tr>
<td>Fer/Ferritinemia</td>
<td>-0.725</td>
<td>-0.808</td>
</tr>
<tr>
<td>CRP/Fer</td>
<td>0.697</td>
<td>0.787</td>
</tr>
<tr>
<td>Fer/CRP</td>
<td>-0.655</td>
<td>-0.8011</td>
</tr>
</tbody>
</table>

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).

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

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

Variable Pearson Spearman
LDH/Ferritinemia -0.725 -0.808
Ferritinemia/CRP 0.697 0.787
Ferritinemia/CRP -0.655 -0.8011