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Role of Lactate Dehydrogenase Among COVID–19 Patients at Admission

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Abstract

Background: Lactate dehydrogenase (LDH) is present in all tissues of the body and catalyses pyruvate to lactate conversion for anaerobic glucose oxidation. Elevated LDH was found to be associated with severe COVID -19 outcomes. Elevated LDH levels were found to be associated with a 6-fold increase in the odds of developing severe disease and a 16-fold increase in mortality in patients with COVID-19. We aimed to study the proportion of patients with high LDH and to correlate serum LDH levels with biochemical and hematological parameters and to identify the complications and severity of the disease which is associated with elevated LDH among COVID-19 patients in South India.

Materials and Methods: This is a hospital-based retrospective study conducted at Sri Manakula Vinayagar Medical College and Hospital, Puducherry, over a period of 3 months. Baseline clinical information and laboratory investigations were collected.

Results: The proportion of high LDH in COVID-19 (n=80) patients in our study was found to be 61.25%. Individual with high LDH level has high mortality rate and ICU admission when compared to individuals with normal LDH levels. Correlation analysis revealed that LDH showed a positive correlation with the duration of hospital stay (p=0.003).

Conclusion: LDH was found to be correlated with hospital stay and increase in mortality and ICU admissions.

Keywords: LDH, COVID-19

Introduction

Lactate dehydrogenase (LDH) is present in all tissues of the body and catalyses pyruvate to lactate conversion for anaerobic glucose oxidation. Elevated LDH was found to be associated with severe COVID -19 outcomes. Elevated LDH levels were found to be associated with a 6-fold increase in the odds of developing severe disease and a 16-fold increase in mortality in patients with COVID-19. Studies on Elevated LDH in South India were not available.In our study, we intended to discuss the role of serum Lactate Dehydrogenase in COVID - 19 patients and serum LDH levels to predict the hospital duration among COVID – 19 patients.

Aim:

1. To study the proportion of patients with high LDH.
2. To correlate serum LDH levels with biochemical and hematological parameters.

Materials and Methods:

This is a hospital-based retrospective study conducted at Sri Manakula Vinayagar Medical College and Hospital, Puducherry, over a period of 3 months. Baseline clinical information and laboratory investigations were collected.

Results:

The proportion of high LDH in COVID-19 (n=80) patients in our study was found to be 61.25%.

Correlation of sociodemographic and Laboratory parameters of LDH levels of COVID – 19 patients.

PARAMETER	r Value	p Value
Age (Yrs.)	0.006	0.587
Glucose (mg/dL)	0.134	0.242
Urea (mg/dL)	0.157	0.167
Creatinine (mg/dL)	-0.053	0.645
WBC (cells/cu.mm)	0.211	0.062
Platelet (X1000/µL)	-0.183	0.106
Neutrophil (%)	0.105	0.355
Lymphocyte (%)	-0.035	0.756
Monocyte (%)	-0.003	0.978
Days in Hospital	0.325	0.003

Age (Years), Glucose (mg/dL), Urea (mg/dL), Monocyte (%), WBC (cells/cu.mm), Platelet (X1000/µL), Days in Hospital corelation was calculated by using Spearman correlation coefficient and Creatinine (mg/dL), Neutrophil (%), Lymphocyte (%) was calculated by Pearson correlation coefficient and p value < 0.05 was significant.

Discussion:

In this study, we analysed the laboratory findings in 80 patients with COVID - 19 who were admitted to Sri Manakula Vinayagar Medical College, Madagadipet, Puducherry between April 2021 to June 2021.

Dan Zhang et al revealed that the LDH level, which can be easily assessed, is significantly and independently associated with in-hospital mortality. Our study was also significantly associated with Days in Hospital (hospital stay)

Bartosz Bialek et al in their study showed that the patients who did not require treatment in the intensive care unit (ICU) showed significantly lower levels of LDH compared to patients who required treatment in the ICU. In our study, COVID – 19 patients who were admitted to the Intensive Care Unit (ICU) has 2 times high odds of LDH level than the patient who were admitted to the ward in our hospital.

The limitations of our study are the small sample size and many of the patients did not do LDH levels on the day of admission.

Conclusion:

High LDH was found to be correlated with hospital stay and increase in mortality and ICU admissions.

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