Original Research Paper

General Medicine

A STUDY ON PROGNOSTIC VALUE OF SERUM LACTATE DEHYDROGENASE AND CREATINE PHOSPHOKINASE LEVELS IN DENGUE FEVER

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ABSTRACT Worldwide about 100 million people are affected with dengue fever every year. Dengue is the most widely distributed mosquito-borne viral infection of humans1. In categorization of South East Asian countries for dengue fever, India is considered under Category-A where it is a major public health problem with hyperendemicity of all 4 serotypes in urban areas and spreading to rural areas2. India being a developing country there is a need for better utilization of resources to predict the severity of disease. Assessment of severity is essential for further management of the disease.In this study, we looked at the prognostic value of lactate dehydrogenase(LDH) and creatine phosphokinase(CPK). **AIM:** To study the predictive value of LDH and CPK in dengue fever according to severity. **Methods and materials**: 85 patients of different severities of Dengue fever admitted to NRIGH are taken into a cross sectional prospective study and assessed. Dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) are the different stages of severity taken into account. Statistical analysis: Statistical data analysis included mean, standard deviation, median, percentage and its level of significance. Results of laboratory parameters (continuous measurements) are displayed as mean ± standard deviation, median and range. Frequency (Categorical) measurements are presented as numbers and percentage. Paired t-test, Mann Whitney U test and Fischer's Exact Test are applied as necessary. **Results:** Among 85 patients with dengue fever, 78 were having DF, 6 had DHF and 1 had DSS. The mean age of the patients included in the study was 38.7 years with standard deviation of 15.6. Maximum number of individuals was within the age group of 20 – 39 years. The eldest in the study was 73 years. This study showed no statistically significant correlation between CPK levels and severity of dengue fever. **Conclusion:** Studies done at different parts of the world showed significant correlation between serum LDH and CPK levels. This study didn't find significant correlation between serum LDH levels, serum CPK levels with severity of dengue fever but significant variation was noted in CPK and LDH levels among dengue subtypes. Probably lack of equal proportional cases from different subtypes we couldn't find correlation. Study with larger sample size and proportional cases in different subtypes might be required to test the correlation.

INTRODUCTION

Dengue fever (DF) is caused by virus belonging to family Flaviviradae. It is spread by Aedes mosquitoes. Disease burden is increasing globally.It can present as an acute febrile illness without any complications or with complication sub type Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS)1. In hypoperfused state or stressful conditions, cells depend on anaerobic glycolysis for utilization of glucose. For conversion of pyruvate to lactic acid, the enzyme required is lactate dehydrogenase. In stressful conditions or hypo perfused states there is increased LDH levels.CPK is an enzyme for dephosphorylating creatine which is formed from glycine, arginine & methionine. CPK is present only in muscles, liver & heart. Because these organs can be affected in dengue fever, CPK enzyme levels are elevated. There are studies showing significant correlation and no correlation between CPK levels, LDH levels and severity of dengue fever.In this study we want to see correlation between CPK, LDH levels and severity of dengue fever.

AIM: To study the predictive value of serum lactate dehydrogenase and creatine kinase in assessing severity of dengue fever.

CASE STUDY

This is a cross- sectional, descriptive, prospective study conducted at NRI Medical College and Hospital with sample size of 85.

Duration of Study: 18 months from February 2021 to June 2022

Inclusion Criteria :
(1) Patients diagnosed to have dengue fever with dengue rapid test only NS 1 positive.
(2) Patients above the age of 18 years.

Exclusion Criteria :
(1) Patients with past history of chronic liver disease, chronic kidney disease, ischemic heart disease, hematological malignancies, immune thrombocytopenic purpura and hemolytic anemia are excluded.

(2) Patients with Ig M or Ig G positive.
(3) Patients with severe dengue fever at admission

Among 85 dengue virus infected patients, 78 (92%) were classified as having dengue fever (DF), 6 (7%) with dengue hemorrhagic fever (DHF) and 1 (1%) with dengue shock syndrome (DSS) as per the WHO-South East Asia Region classification criteria.

Statistical data analysis included mean, standard deviation, median, percentage and its level of significance. Results of laboratory parameters (continuous measurements) are displayed as mean ± standard deviation, median and range. Frequency (Categorical) measurements are presented as numbers and percentage. Paired t-test, Mann Whitney U test and Fischer's Exact Test as available in the statistical software package SPSS-22 was employed for finding level of significance between sub- groups. A p-value < 0.05 is considered significant, while p-value < 0.001 is considered highly significant.

RESULTS:

1. Age Distribution

Age	No. of patients	% of patients
18-19	9	10.6
20-29	19	22.3
30-39	19	22.3
40-49	12	14.2
50-59	17	20
60-69	5	5.9
>=70	4	4.7

2. Gender-wise Distribution

category	Male (n)	Female (n)
DF	44	34
DHF	4	2

DSS	1	0
Dengue (total)	49	43

3. Packed cell volume (PCV)

Dengue subtype	PCV mean (%)	PCV standard deviation
DF	42.47	5.93
DHF	47.17	2.17
DSS	49.50	

4. Platelet count

Parameter	DF	DHF	DSS
Platelet count <20000/cu.mm	10	3	1
Platelet count >20000/cu.mm	68	3	0

5. Serum LDH levels

LDH	DF	DHF	DSS	Total
<300	19	2	0	21
300-600	51	3	0	54
>600	8	1	1	10
Total	78	6	1	85

P value = 0.752

6. Serum CPK levels

CPK (IU/L)	DF	DHF	DSS
<300	59(75.64%)	5	0
300-600	15(19.23%)	1	0
>600	4(5.13%)	0	1

P value = 0.46

DISCUSSION:

Kulothungan R et al., did a study on 103 cases of dengue fever and found LDH values are significantly correlating with severity of dengue fever (P-value- <0.001)3. LDH levels among dengue fever without warning signs (51.4% of total cases), 49 (92.5%) cases had LDH levels less than 300 IU/L, 4 (7.5%) cases had LDH levels between 300 -600 IU/L & none had LDH levels above 600 IU/L. LDH levels among dengue fever with warning signs (48.6% of total cases) 1 (2%) cases had LDH levels less than 300 IU/L, 12 (24%)cases had LDH levels between 300 -600 IU/L & 37(74%) had LDH levels above 600 IU/L. Kulothungan R et al., did a study on 103 cases of dengue fever and found CPK values are well correlating with severity of dengue fever (P-value- <0.001)3. CPK levels among dengue fever without warning signs (51.4% of total cases) 51 (96.2%) cases had CPK levels less than 300 IU/L, 2 (3.8%) cases had CPK levels between 300 -600 IU/L & none had CPK levels above 600 IU/L. CPK levels among dengue fever with warning signs (48.6% of total cases) 1 (2%) cases had CPK levels less than 300 IU/L, 14 (28%) cases had CPK levels between 300 -600 IU/L & 35 (70%) had CPK levels above 600 IU/L. Kumar Rajesh et al., did a study on typical and atypical manifestations of dengue fever on 105 cases and found there is no correlation between raised CPK levels with severity of dengue presentation4

CONCLUSIONS

The study was done to evaluate correlation between severity of dengue fever with serum LDH and CPK levels. Studies done at different parts of the world showed significant correlation between serum LDH and CPK levels. This study didn't find significant correlation between serum LDH levels, serum CPK levels with severity of dengue fever but significant variation was noted in CPK and LDH levels among dengue subtypes. Probably lack of equal proportional cases from different subtypes we couldn't find correlation. Study with larger sample size and proportional cases in different subtypes might be required to test the correlation.

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