Diagnostic Role of LDH/HDL Ratio in Patients with Prolonged Fever

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Background: A previous study showed that lymphoma patients with low plasma HDL-cholesterol (HDL) level are associated with fever and elevated serum lactate dehydrogenase (LDH) level. Among patients with prolonged fever, we hypothesized that the LDH/HDL ratio in the lymphoma-related fever should be higher than the non-lymphoma-related fever.

Objective: To evaluate a role of the LDH/HDL ratio in diagnosis of lymphoma in patients presented with prolonged fever.

Methods: An observational prospective cohort study of 130 adult patients (66 men) with fever ≥2 weeks from November 2014 to February 2016 was conducted. The clinical data including final diagnosis and ratios of LDH/HDL were collected. The association between LDH/HDL ratio and causes of prolonged fever was analyzed. All possible confounding factors for elevated LDH levels (e.g. hemolysis, hepatitis) and decreased HDL levels (e.g. diabetes mellitus, liver disease) were also included in multivariate analysis.

Results: A number of 29/130 (22.3%) patients were diagnosed lymphoma. The non-lymphoma group included infection (30%), autoimmune (20%), other hematologic malignancy (8.5%), and unknown cause (8.5%). Patients with unknown cause of prolonged fever were excluded from further analysis. The ratio of LDH/HDL in the lymphoma group was higher than the non-lymphoma group (median, 187 vs. 32). The LDH/HDL ratio cut-off of 110 or higher was significantly associated with diagnosis of lymphoma (odds ratio, 20.6; 95% CI, 6.9 to 61.8; P<0.001) with 82.8% sensitivity, 81.1% specificity, 58.5% positive predictive value, 93.6% negative predictive value, and area under the receiver-operating-characteristic (ROC) curve 0.82 (95% confidence interval, 0.74 to 0.90). Univariate analysis demonstrated that night sweat, splenomegaly, and LDH/HDL ratio ≥ 110 were significantly associated with diagnosis of lymphoma. The simplified composite score was created <-8+3(night sweating) +3(splenomegaly) +6(ratio≥110)>, with the diagnostic index increased area under ROC curve to 0.873.

Conclusion: Among adults with prolonged fever, the LDH/HDL ratio below 110 suggests the diagnosis of non-lymphoma cause.

Keywords: Lymphoma, Prolonged fever, LDH/HDL ratio