CORRESPONDENCE

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Correlation between lactate dehydrogenase and other laboratory data in patients with atopic dermatitis

Dear Editor,

Atopic dermatitis (AD) is a chronic inflammatory skin disease characterized by pruritic and eczematous lesions.[1] AD is associated with elevated serum immunoglobulin (Ig) E levels, specific IgE environmental allergens such as house dust mites, and tissue and peripheral blood eosinophilia.[1] Since AD is thought to be a Th2-dominant inflammatory skin disease, especially in the acute phase, thymus and activation-regulated chemokine (TARC) is assumed to be involved in its pathogenesis.[2,3]

Lactate dehydrogenase (LDH) is an enzyme present in most cells. Previous studies[4] found that elevated serum LDH5 levels are correlated with epidermal cell damage in eczema-associated erythroderma and changes in serum LDH levels can serve as a clinical marker for assessing the severity and clinical course of AD.[2]

The aim of the present study was to explore the correlation between LDH levels and other laboratory data such as IgE and TARC levels and eosinophil count in patients with AD who visited Hirosaki University Hospital. This study was approved by the Committee of Medical Ethics of Hirosaki University Graduate School of Medicine in Aomori, Japan.

This study included 128 patients with AD who visited Hirosaki University Hospital. The following variables were measured: LDH; white blood cell count (neutrophils, lymphocytes, monocytes, eosinophils, and basophils); platelet count; and levels of hemoglobin, TARC, total IgE, and C-reactive protein (CRP). Laboratory data were retrieved from medical records.

We investigated the correlation between LDH levels and each laboratory variable using Pearson's test. The Pearson correlation coefficient is a measure of linear correlation between two sets of data. The result always has a value between −1 and 1. The significance level was set at $p < .05$, and the correlation coefficient ±.4 to ±.7 was considered as correlation.
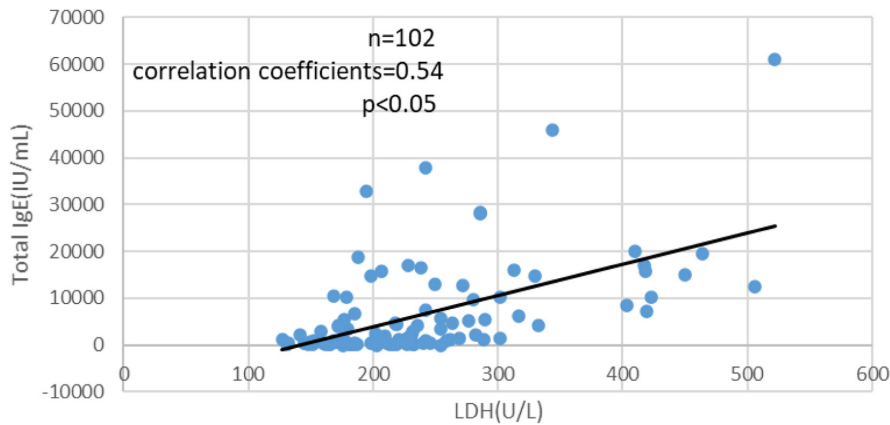
Only total IgE and TARC levels were positively correlated with LDH levels. The correlation coefficient for IgE and LDH levels was .54 ($p < .001$) (Figure 1A). The correlation coefficient for TARC and LDH levels was .57 ($p < .001$) (Figure 1B). Eosinophil count was weakly correlated with LDH levels (correlation coefficient, .41; $p < .001$) (Figure 1C). There was no correlation between TARC and IgE levels, TARC levels and eosinophil count, or IgE levels and eosinophil count.

In this study, LDH levels were positively correlated with total IgE levels, TARC levels, and eosinophil count, respectively. Although the correlation between serum IgE levels and disease severity of AD is controversial, a previous study reported that IgE is significantly correlated with EASI score.[5] LDH is also considered useful for evaluating disease severity of AD. Since TARC measurement is costly and should be performed only once a month for AD under the Japanese health insurance system, LDH levels and eosinophil count, which are more convenient markers than TARC levels, could be useful in daily clinical evaluation of patients with AD. The limitation of this study is that we did not compare LDH and disease severity of AD directly. So, we cannot conclude yet, and further study is needed.
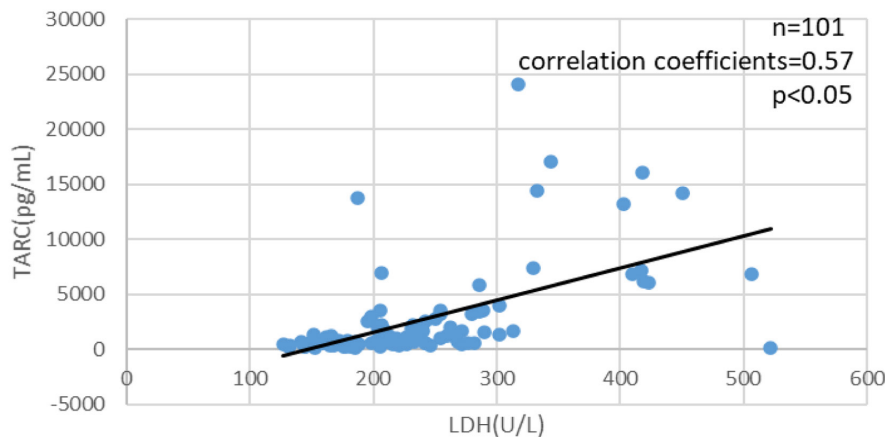
(A)

The correlation between LDH and Total IgE

n=102
correlation coefficients=0.54
p<0.05

(B)

The correlation between LDH and TARC

n=101
correlation coefficients=0.57
p<0.05

(C)

The correlation between LDH and eosinophilis

n=104
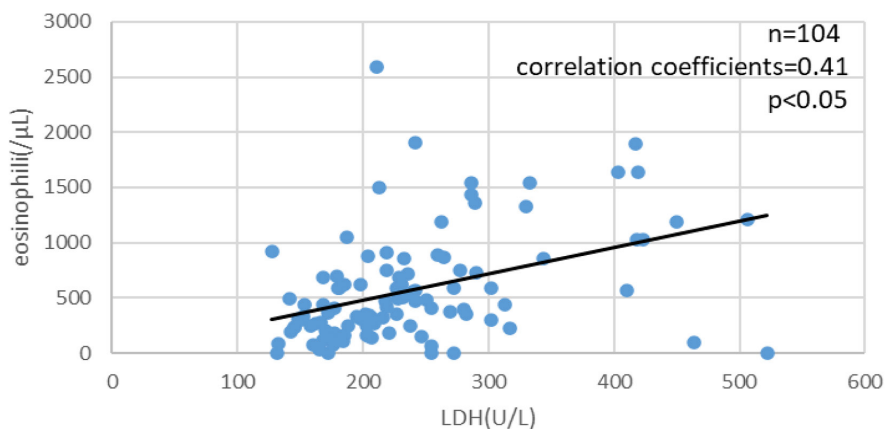correlation coefficients=0.41
p<0.05

FIGURE 1 (A) Correlation between serum LDH and total IgE concentration. The correlation coefficient is .54. (B) Correlation between serum LDH and TARC concentration. The correlation coefficient is .57. (C) Correlation between serum LDH concentration and eosinophils counts. The correlation coefficient is .41. They are weakly correlated

DECLARATION SECTION

Approval of the research protocol: The protocol for this research project has been approved by a suitably constituted Ethics Committee of the institution, and it conforms to the provisions of

the Declaration of Helsinki. The study protocol was approved by the Committee of Medical Ethics of Hirosaki University Graduate School of Medicine. Approval No. 2021-025.

Informed Consent: All informed consent was obtained from the subjects or guardians.

Registry and the Registration No. of the study/trail: The study outline was registered and published in the Japan Registry of Clinical Trials (trial ID no. jRCT1020210017).

Animal Studies: N/A.

CONFLICT OF INTEREST

The authors declare no conflict of interest. Management of the peer review process, and all editorial decision making, for this article was undertaken by Editor in Chief, Prof. Manabu Fujimoto.

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