Abstract

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Lymphocyte and plasma vitamin C levels in type 2 diabetic patients with and without diabetes complications.

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BACKGROUND: Diabetes has been considered to be associated with oxidative stress. It has been suggested that increased free radicals and decline of antioxidant defense mechanisms induce diabetic micro- and macrovascular complications. Vitamin C is one of the major antioxidants and is detected in various blood components. However, measurements of vitamin C levels have shown inconsistent results, and the interpretation of vitamin C levels in diabetes as an antioxidant biomarker has not been clarified.

OBJECTIVE: In this study, we investigated the lymphocyte and plasma vitamin C levels in type 2 diabetic patients with and without diabetes complications.

RESULTS: Increased oxidative stress in diabetes could contribute to depletion of antioxidants such as vitamin C. In this report, we demonstrated that the lymphocyte vitamin C level is significantly lower in type 2 diabetic patients, but we could not observe such an association in plasma vitamin C levels. The plasma concentration of vitamin C is considered to be strongly correlated with transient consumption of foods such as fruit, supplements, and vegetables. Compared with plasma, lymphocyte has been reported to maintain a vitamin C concentration as large as 80- to 100-fold across the plasma membrane and to have cell-membrane transporting mechanisms between vitamin C and glucose.

CONCLUSION: In diabetes, therefore, the measurement of lymphocyte vitamin C might be expected to be a more reliable antioxidant biomarker than plasma vitamin C level.

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