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Assessment of Mineral Pathophysiology in Patients with Diabetic Foot Ulcer.

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Abstract

Chronic non-healing diabetic foot ulcers (DFU) with a recurrence rate of over 50% in 3 years account for more than 1,08,000 non-traumatic lower extremity amputations. Reports of altered mineral status and their role in pathogenesis of diabetes are well documented. However, little is known regarding their status and impact on severity of complications like foot ulcer. A hospital-based case control study was conducted in 64 subjects aged 40-60 years, attending the Podiatric and the Diabetes clinic of the institutional hospitals. Study subjects included were 32 diagnosed cases of type 2 diabetes having foot ulcers along with 32 age-matched diabetics without foot ulcer as controls. Fasting and post-prandial plasma glucose were estimated by glucose oxidase peroxidase method and HbA1c by high-performance liquid chromatography method. Serum zinc, magnesium and copper levels were estimated by colorimetric methods in semi-autoanalyser. Serum levels of zinc, copper and magnesium were significantly decreased in DFU cases as compared with diabetics without ulcers ($p < 0.05$). Correlation analysis revealed a significant inverse correlation of these minerals with all the glycaemic indices; the association being the strongest in case of zinc in both groups. The higher degree of mineral insufficiencies in the foot ulcer group of this study could be responsible for worsening the glycaemic control in diabetics leading to delayed healing of foot ulcers. The observed decrease of serum copper, magnesium and zinc levels in diabetics with foot ulcers appears to be proportionally related to the length of the diabetic disease. Thus, continuous monitoring and dietary supplementation of minerals in case of severe deficiencies might be beneficial in halting the progression of such complications.

KEYWORDS:

Copper; Diabetes foot ulcer; Magnesium; Zinc

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