

The Role of Magnesium and Zinc in Metabolic Syndrome

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The biofactors magnesium and zinc play an important role in the prevention and treatment of metabolic syndrome.

Metabolic syndrome is defined by insulin resistance, obesity, atherogenic dyslipidemia, and hypertension.¹ Among the biofactors, magnesium plays a key role in insulin and glucose metabolism, and magnesium deficiency has therefore been identified as a risk factor in metabolic syndrome and type 2 diabetes mellitus.¹

The blood pressure-lowering effect of magnesium is also well documented. Numerous studies in recent years have shown that magnesium significantly reduces both systolic and diastolic blood pressure. The antihypertensive effect of magnesium is mainly due to its calcium-antagonistic properties.²

Thus, magnesium supplementation can improve outcomes in metabolic syndrome. According to international consensus, the lower limit of normal serum magnesium is 0.85 mmol/L.

Zinc plays an important role in carbohydrate metabolism. It is a component of the zinc–insulin complex and is directly involved in the production, storage, and secretion of insulin by the pancreatic beta cells.

Zinc deficiency increases the risk of insulin resistance. A vicious circle may develop, as increased renal zinc losses due to proteinuria further exacerbate zinc deficiency. Therefore, patients with type 2 diabetes are more likely to have zinc deficiency.

Adequate zinc status can have preventive effects in the development of diabetes. Numerous studies have shown that zinc supplementation can significantly reduce fasting glucose, total cholesterol, LDL cholesterol, and blood pressure.

Furthermore, zinc is a component of superoxide dismutase (SOD) and thus contributes to antioxidant protection and vascular health.

The Tolerable Upper Intake Level (UL) has been set by the European Food Safety Authority (EFSA) at 25 mg zinc per day.³

Practical conclusion: Zinc and magnesium act synergistically in metabolic syndrome.⁴

References

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