

Diabetes as a cause of clinically significant functional cobalamin deficiency.

[Solomon LR](#)¹.

Abstract

OBJECTIVE:

Functional cobalamin (Cbl) deficiency (i.e., high methylmalonic acid [MMA] values despite normal serum Cbl levels) is common in the elderly and associated with neuropathy and anemia. Because diabetes is also common in the elderly and diabetic neuropathy resembles that of Cbl deficiency, the role of diabetes in functional Cbl deficiency was explored.

RESEARCH DESIGN AND METHODS:

A retrospective review was performed of all ambulatory community-dwelling adults with normal renal function evaluated for Cbl deficiency over a 12-year period in a primary care setting. Functional Cbl deficiency was defined as MMA values >250 nmol/L with Cbl levels >400 pg/mL.

RESULTS:

In nondiabetic subjects, MMA values varied directly with age and inversely with serum Cbl. In diabetic subjects, MMA values also increased with age but did not fall as Cbl levels increased. Thus, when Cbl levels were >400 pg/mL, mean MMA values and the incidence of functional Cbl deficiency were both significantly greater in elderly diabetic subjects (at least 70 years old) than in elderly nondiabetic subjects. Moreover, neuropathy was present in 62% of diabetic subjects with high MMA values and in only 18% of diabetic subjects with normal MMA values. Finally, pharmacologic doses of Cbl improved MMA values and neuropathy in 88 and 86% of evaluable diabetic subjects, respectively.

CONCLUSIONS:

These observations suggest that functional Cbl deficiency is common in elderly diabetic individuals, is associated with neuropathy, and is responsive to Cbl therapy. A role for oxidative stress in the pathogenesis of functional Cbl deficiency is proposed