NASAL ABSORPTION OF HYDROXOCOBALAMIN IN HEALTHY OLDER ADULTS

D. van Asselt, F. Merkus, W. Hoefnagels

Dept. of Geriatric Medicine, University Hospital Nijmegen, PO Box 9101, 6500 HB Nijmegen, the Netherlands

Introduction: Cobalamin (Cbl) deficiency is very common among older people. Most physicians use intramuscular Cbl injections for treatment of Cbl deficiency. However, injections have many drawbacks, especially in older people. A more convenient and cost-effective alternative would be advantageous to medical practice.

Purpose: To determine the absorption of nasally administered hydroxocobalamin (OH-Cbl) in an isotonic aqueous medium (patent nr WO 95/17164) in healthy older adults.

Method: In a cross-over study-design OH-Cbl, in a dose of 750 µg and 1500 µg, was administered as nasal spray to 10 healthy adults, age 71.6 ± 4.6 (mean ±SD). Blood samples were collected before administration of the drug and after 10, 20, 30, 40, 60, 120, 180 and 240 minutes. Plasma Cbl concentration was determined by competitive radioisotope binding technique using purified hog intrinsic factor as binder.

Results: After nasal administration of 750 µg OH-Cbl the maximal plasma Cbl concentration (Cmax) and the time to reach the maximal plasma Cbl concentration (Tmax) were 1943 ± 294 pmol/l (mean ± SEM) and 32 ± 2 minutes, respectively. After nasal administration of 1500 µg OH-Cbl the Cmax and Tmax were 3730 ± 807 pmol/l and 28 ± 5 minutes, respectively. After administration of 750 µg and 1500 µg OH-Cbl the increase from baseline to maximum plasma Cbl concentration was 1663 ± 292 pmol/l and 3494 ± 815 pmol/l, respectively. The nasal spray was well tolerated and no side effects were noted.

Conclusions: Nasal absorption of hydroxocobalamin is fast, high and safe. The amount absorbed increases with increasing dose of hydroxocobalamin.

REduced plasma vitamin B12 levels in older patients: A state of B12 deficiency

D. van Asselt, H. Blom, R. Zuiderent, R. Wevers, C. Jakobs, W. van den Broek, C. Lamers, F. Corstens, W. Hoefnagels

The Dept. of Geriatric Medicine, University Hospital Nijmegen, PO Box 9101, 6500 HB Nijmegen, The Netherlands

Background: Reduced vitamin B12 levels are very common in older hospital patients. Most of them have normal blood counts. These low B12 levels are often considered to have no clinical significance or are simply ignored. Objective: To determine whether older patients with reduced B12 levels are B12 deficient. B12 deficiency was considered present when a cause or a sign of B12 deficiency or a response to B12 administration could be identified. Methods: 28 older hospital patients with reduced plasma B12 levels were studied: 23% had B12 levels <75 pmol/L, 27% had B12 levels between 75-100 pmol/L and 50% had B12 levels between 100-160 pmol/L. Two patients with anaemia are not included here since they are likely to be considered B12 deficient. Free and protein-bound B12 absorption were assessed. Haematologic, neurologic and metabolic (plasma methylmalonic acid and total homocysteine levels) measurements were obtained. 17 patients could be evaluated after parenteral B12 administration. Findings: Causes of B12 deficiency, i.e. B12 malabsorption, were identified in 81%. Signs of B12 deficiency were identified in 96%: macrocytosis in 15%, hypersegmented neutrophils in 54%, neurologic abnormalities in 31%, and elevated metabolite levels in 88%. All patients available for follow-up had a haematologic or metabolic response to B12 administration. Therefore, all 3 criteria of B12 deficiency were fulfilled by 65%, 2 criteria were fulfilled by 27% and 1 criterion by only 8%. Interpretation: Older patients with reduced B12 levels are B12 deficient and should receive B12 therapy.