

Total plasma homocysteine in hospitalized elderly: associations with vitamin status and renal function

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Background: Hyperhomocysteinemia (total plasma homocysteine (tHcy) >15 µmol/L) has been reported frequently in the elderly. Several studies have suggested an association between hyperhomocysteinemia and heart disease. Adequate folic acid and vitamin B₁₂ intake and serum concentrations act synergistically to decrease the risk, but renal insufficiency increases the risk of hyperhomocysteinemia.

Objective: To describe the prevalence of hyperhomocysteinemia in hospitalized elderly and to investigate whether nutrition status and other factors are related to tHcy.

Methods: Sixty hospitalized elderly patients participated in this cross-sectional study at the Landspítali-University Hospital. Blood was taken in fasting state and analysed for tHcy, cystatin C (as marker for renal function), folic acid and vitamin B₁₂. Nutrition status was assessed. Statistical analyses included multivariate regression.

Results: The prevalence of hyperhomocysteinemia was 31.7%, and decreased renal function was observed in 38.3% of the subjects. tHcy correlated positively with cystatin C, but negatively with vitamin B₁₂ and folic acid. Age or nutrition status were not related to tHcy. In the multivariate regression analysis folic acid and cystatin C remained significant predictors of tHcy (adjusted R²=60.6%). According to the regression model folic acid concentration of >30.3 nmol/L was required to achieve a mean tHcy <15.0 µmol/L in patients with reduced renal function.

Conclusion: Hyperhomocysteinemia is frequent in hospitalized elderly. Cystatin C and folic acid explain most of the tHcy variance. Higher folic acid levels within normal range might further decrease tHcy. The current lower folic acid cut-off (6 nmol/L) might not be sufficient in preventing hyperhomocysteinemia in hospitalized elderly with reduced renal function.