

Omega-3 and Serum Homocysteine Level in Hemodialysis Patients

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Cardiovascular disease is a leading cause of death in end-stage renal disease patients. One of the well-known independent risk factors is hyperhomocysteinemia. The prevalence of hyperhomocysteinemia is more than 90% in hemodialysis patients.^{1,2} There are studies that have shown folate and vitamin B6 can decrease the level of homocysteine. However, the effect of these supplements for secondary prevention is under question. In a meta-analysis by Bazzano and colleagues,³ folic acid therapy has not any effect on cardiovascular risk reduction. In another meta-analysis by Wang and colleagues,⁴ folate supplementation could decrease by 20% the hyperhomocysteinemia level, but no effect on stroke risk. There was also no supporting evidence on protective effect of folate and B vitamins combination in general population.⁵ In a double-blind randomized control trial in chronic kidney failure patients, the effect of a daily dose of 40 mg of folic acid and B vitamins on mortality and vascular disease were evaluated. The mean follow-up duration was 3.2 years. Mortality, myocardial infarction, and stroke were not different between the two groups. They concluded that folate and B vitamins have no role in patient survival in chronic kidney disease patients.⁶

Omega-3 fatty acid has been introduced as a cardioprotective supplement. One reason can be the effect of omega-3 on homocysteine level. Haung and coworkers,⁷ in a meta-analysis of 11 randomized control trials which included 702 participants, showed supplementation with omega-3 poly-unsaturated fatty acid was associated with a significant decrease in plasma homocysteine level (weighted mean difference, $-1.59 \mu\text{mol/L}$; 95% confidence interval, -2.34 to -0.83) compared with control subjects. There are few studies in literature which evaluated the effect of omega-3

on homocysteine level in hemodialysis patients. In this issue of the *Iranian Journal of Kidney Diseases*, Tayebi Khosroshahi and colleagues⁸ have reported the effect of omega-3 on homocysteine level in 88 hemodialysis patients. In a randomized control trial, case group received 1 g of omega-3 with each meal. They showed the omega-3 reduced the homocysteine level in 8 weeks. This study faced us with 3 questions: Does the omega-3 have a direct effect on decreasing the homocysteine level in hemodialysis patients? What is the mechanism of action? Does omega-3 have any role in decreasing cardiovascular mortality?

In this study, there were some limitations such as small patient group, lack of blind allocation, and inaccessibility to check interfering effects of folate, vitamin B6, and vitamin B12 levels. Thus, answering to the first question needs more studies in this population. Huang and colleagues⁹ answered the second question by doing research on human hepatocellular cells. They treated the cells with fatty acids for 48 hours. They could show regulatory effects on mRNA expression of homocysteine genes. Finally, as B vitamins and folate supplements can decrease homocysteine level, but have no effects on patient survival, the effect of omega-3 on cardiovascular risks should also be evaluated.

CONFLICT OF INTEREST

None declared.

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