

Serum Lipoprotein, Statin Use, and Cognitive Functions in Middle Aged Population

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ABSTRACT:

Background: Hypercholesterolemia is a major risk factor for coronary heart disease and cerebral atherosclerosis. However, there has been concern that cholesterol lowering could have an adverse effect on cognitive functions and psychological well being. **Objective:** The aim of the present work is to study the cognitive functions in middle aged population with primary hypercholesterolemia, and to evaluate the effect of statin therapy on cognition. **Material & Methods:** The present study included fifteen patients with primary hypercholesterolemia, not receiving any lipid lowering drugs (group I), Fifteen patients with primary hypercholesterolemia receiving statins for variable duration (group II), and fifteen healthy control subjects, age and sex matched (group III). Both the patients and control groups were subjected to complete general examination, thorough neurological examination, psychiatric interviewing and cognitive functions assessment using the Mini Mental State Examination (MMSE) test, and Digit Span and digit-symbol substitution subtests of Wechesler Adult Intelligence Scale-Revised (WAIS-R). **Results:** The mean scores of the MMSE, and digit-symbol substitution test of the hypercholesterolemic patients (group I) were significantly lower than those of the control group ($P=0.039$, 0.030 respectively). The mean digit span score was also lower in the hypercholesterolemic group than in the control group, although the difference was not statistically significant ($P=0.570$). The degree of cognitive impairment was positively correlated with the age of patients, total cholesterol (TC), and low density lipoprotein-cholesterol (LDL-C)

Introduction

Dyslipidemia is a common medical problem with diverse etiologies. It may be genetic (primary dyslipidemia) or due to other disorders, drugs, or behavioural factors (secondary dyslipidemia) (Carlson, et al. 2001) Cholesterol is an integral component of cell membrane. The brain has a high lipid content and dietary cholesterol directly influence brain cholesterol concentration and function (Yeagle, et al. 1991, Howlan, et al. 1998) Serum lipids may be an important predictor of cognitive functions. However, data on the relation between serum lipids and cognitions are sparse and inconsistent. Hypercholesterolemia promotes atherosclerosis and total cholesterol elevation are linked to vascular dementia (Cicconetti P, et al. 2004) Yaffe K, et al in 2002, found that higher total cholesterol level (TC) and low density lipoprotein-Cholesterol (LDL-C), were associated with cognitive impairment in elderly females (mean age: 71 years). They concluded that lowering these lipids may be a strategy for preventing cognitive deterioration (Yoffe K, et al. 2002) On the other hand, the relation between serum lipids and cognition in middle- aged

population might be different. Previous reports suggested that higher concentration of TC and LDL-C are associated with better cognitive performance, and aggressive treatment of hypercholesterolemia may result in minor decrement of cognitive functions particularly those dependent on mental manipulation or rapid mental processing (Benton, et al. 1995) (Muldoon, et al. 2004) (Zhang J, et al. 1994) 3 Hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors, or statins are safe and effective lipid-lowering drugs, widely used for treatment of hyperlipidemia and prevention of atherosclerosis. Statin use is linked to reduced risk of dementia, although it is not certain that this is due to reduction of serum lipid or to statin itself (Wolozin B, et al. 2000) (Jick, et al. 2000) Reduced risk of dementia was associated with less potent statins (Wolozin B, et al. 2000), and may not occur with other classes of lipid lowering drugs (Jick, et al. 2000). The aim of the present study is to study the relation between serum lipids, and statin use on cognitive functions in middle-aged population.