STUDY OF RELATION OF SERUM POTASSIUM TO COGNITIVE FUNCTION IMPAIRMENT IN PREVALENT HEMODIALYSIS PATIENTS

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INTRODUCTION AND AIMS: Cognitive functions impairment is common and frequently marked in prevalent hemodialysis (HD) patients. Hypokalemia has been accused as a possible cause for cognitive function disturbances, in particularly memory changes, in patients with congestive heart failure due to vital role of potassium channels in nerve conduction and functions. Though serum potassium changes are frequently encountered in HD patients, the possible effect of serum potassium on cognitive dysfunction in these patients is not previously reported in the literature. The aim of this study is to assess the possible relation of serum potassium to cognitive function impairment in prevalent hemodialysis patients.

METHODS: Forty five stable HD patients (including eighteen females) were randomly selected from our hemodialysis unit and were investigated by pre-dialysis CBC & routine chemistry in addition to Wechler Adult Intelligence test, the Mini Mental State Examination (MMSE) test, Verbal paired association I & II test (to assess immediate and delayed recall of verbal memory), Digit span forward and backward tests (to assess short term auditory memory and working memory respectively), Trail Making test part A & B (to assess visual attention and executive functions) as well as Carotid Artery Duplex Scan to assess carotid intima-media thickness. Exclusion criteria included age>60 years, smokers, diabetics, patients with uncontrolled dyslipidemia, uncontrolled hypertensives, patients with significant cerebro-vascular or cardiovascular disease, patients with collagen disease including vasculitis, patients with psychiatric illness or taking drugs affecting mental functions, hemoglobin level <9gm/dl, plasma albumin<3gm/dl. A control group of fifty apparently healthy subjects (of similar age & sex) was similarly studied.

RESULTS: We detected significantly lower serum potassium in patients with impaired visual memory compared to patients with normal visual memory (p=0.019), significantly lower serum potassium in patients with impaired delayed recall of verbal memory compared to patients with normal delayed recall (p=0.013), and highly significant lower serum potassium in patients with impaired immediate recall of verbal memory (p=0.001). We also detected highly significant positive correlations between serum potassium and each of global cognitive function score (p=0.008), both visual (p=0.016) and verbal memory scores as regard immediate (p=0.003) and delayed recall (p=0.006) functions.

CONCLUSIONS: It may be concluded that lowering serum potassium in HD patients may be associated with impaired cognitive function particularly memory functions and that higher levels of serum potassium might have beneficial effect on cognitive functions (particularly memory functions) in prevalent hemodialysis patients.