Serum Potassium Is Associated with Cognitive Decline in Patients with Lewy Body Dementia

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Abstract: Background: Epidemiological studies link serum potassium (K+) to cognitive performance, but whether cognitive prognosis in dementia is related to K+ levels is unknown. Objective: To determine if K+ levels predict cognitive prognosis in dementia and if this varies according to diagnosis or neuropathological findings. Methods: This longitudinal cohort study recruited 183 patients with mild Alzheimer’s disease or Lewy body dementia (LBD). Serum K+ and eGFR were measured at baseline and medications which could affect K+ registered. The Mini-Mental State Examination (MMSE) was measured annually over 5 years, and mortality registered. Association between K+ and √(30-MMSE) was estimated overall, and according to diagnosis (joint model). Associations between MMSE-decline and K+ were assessed in two subgroups with neuropathological examination (linear regression) or repeated measurements of K+ over 3 years (mixed model). Results: Serum K+ at baseline was associated with more errors on MMSE over time (Estimate 0.18, p = 0.003), more so in LBD (p = 0.048). The overall association and LBD interaction were only significant in the 122 patients not using K+ relevant medication. Repeated K+ measures indicated that the association with MMSE errors over time was due to a between-person effect (p < 0.05, n = 57). The association between the annual MMSE decline was stronger in patients with autopsy confirmed LBD and more α-synuclein pathology (all: p < 0.05, n = 41). Conclusion: Higher serum K+ predicts poorer cognitive prognosis in demented patients not using medications which affect K+, likely a between-person effect seen mainly in LBD.

Keywords: α-synuclein, Alzheimer’s disease, cognitive decline, kalium, Lewy body dementia, Mini-Mental State Examination, MMSE-decline, potassium, prognosis

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