Fibroblast Growth Factor-23(FGF-23) And Cognitive Performance In Hemodialysis Patients

Thesis

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List Of Abbreviations

3MS	An extension of the mmse with four additional subtests and a maximum score of 100 points instead of 30 points
BDI	Beck depression inventory
BVRT	Benton visual Retention Test
BVRT-ECS	Benton visual Retention Test expected correct score
BVRT-OCS	Benton visual Retention Test Obtained correct score
BVRT-OES	Benton visual Retention Test obtained error score
CSF	Cerebro spinal fluid
CKD	Chronic kidney disease
CRIC	Chronic renal insufficiency cohort
CBT	Cognitive behavioral therapy
ESRD	End stage renal disease
ES-D	Epidemiologic studies depression scale
eGFR	Estimated glomerular filtration rate
FGF-23	Fibroblast growth factor -23
FGFR	Fibroblast growth factor receptor
HOST	Homocysteine study
LVH	Left ventricular hypertrophy

LVMI	Left ventricular mass index
MMSE	Mini Mental State Examination
PTH	Parathyroid hormone
PCA	Principal component analysis
TICSm	Telephone interview for cognitive status modified
TMT-A	Trail making test part A
VPA	Verbal paired associate
WMS	Wechsler Memory scale
WAIS	Wechsler adult intelligence scale

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ABSTRACT

Back ground Although cognitive impairment is common in hemodialysis patients, the etiology of and risk factors for its development remain unclear. Fibroblast growth factor 23 (FGF-23) levels are elevated in hemodialysis patients and are associated with increased mortality and left ventricular hypertrophy.**Material and methods** We measured FGF-23 in 85 prevalent hemodialysis patients in whom comprehensive neurocognitive testing was also performed. The cross-sectional association between patient characteristics and FGF-23 levels was assessed. Principal factor analysis was used to derive two factors from cognitive test scores, representing memory and executive function. Multivariable linear regression adjusting for age, sex, education status, and other relevant covariates was used to explore the relationship between FGF-23 and each factor.**Results** Mean age was 38.5±10 years, 45.9% were women. The median FGF-23 level was 39 ng/L. Younger age, low hemoglobin were independently associated with higher FGF-23 levels.High FGF-23 level were associated with high KT/V(P=0.017).There were no association between cognitive impairment and FGF-23 levels,however by multi-regression analysis higher FGF-23 were associated with low parathyroid hormone ,high hemoglobin and low score of memory function test (p=0.01)**. conclusion** there were no association between FGF-23and cognitive impairment in hemodialysis patients.

Key word

Hemodialysis,cognitive impairment ,FGF-23

Introduction

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Cognitive impairment is common in individuals with chronic kidney disease (CKD) , particularly among those treated with dialysis. Cognitive impairment adversely impacts multiple areas of patient care, including patient compliance with treatment plans, quality of life, and mortality ;therefore, understanding its pathogenesis is essential to improving outcomes for patients with ESRD ***(Murray et al., 2006).***

Hemodialysis and CKD populations share most of these same risk factors for cognitive impairment to the general population. However, in contrast the roles of aging and non-vascular factors are overshadowed by stroke and the high prevalence of cardiovascular risk factors ***(Nissenson et al., 1991).***

In addition, the contributions of factors secondary to kidney failure such as uremia, anemia, metabolic disturbances and hemodynamic instability during dialysis are still to be defined ***(weiner et al., 2011).***

Fibroblast growth factor 23 (FGF-23) is a phosphaturic hormone, whose levels increase as kidney function declines ***(Larsson et al., 2003).***

Several cross-sectional studies in CKD, ESRD, and non-CKD populations demonstrated that elevated FGF23 levels are independently associated with greater left ventricular mass index and greater prevalence of LVH ***(Kirkpantur et al., 2011).***

Elevated FGF23 levels were also associated with reduced ejection fraction and prevalent atrial fibrillation but not coronary artery disease ***(Gutierrez et al., 2008) .***

Through a Klotho-independent pathway involving stimulation of fibroblast growth factor receptors, FGF-23 may cause direct end-organ toxicity, particularly within cardiac muscle ***(FAUL C et al., 2011) .***

Although primarily expressed in the bone, FGF-23 is also found in high concentrations within the brain .As both Klotho and FGF receptors are also found within the brain ***(Yamashita et al., 2000).***

There are few studies investigating factors associated with FGF-23 levels in hemodialysis patients and that evaluate the relationship between FGF-23 and cognitive function ***(Drew., et al.,2014).***

Aim of the work

To determine the level of FGF-23 in hemodialysis patients and its possible relation with cognitive impairment in such patients.