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Cognitive functions in patients with chronic renal failure patients

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ABSTRACT

Objective: The present study was undertaken to assess the cognitive functions in chronic renal failure patients. **Methods**: 30 Patients with chronic kidney disease with renal failure, and 30 healthy, age matched controls, including both males and females were included in the study. Cognitive functions were assessed by MMSE and spatial and verbal memory test. **Results:** MMSE scores, spatial and verbal memory scores were significantly impaired in patients with chronic renal disease. **Conclusion:** We have observed significant impaired cognitive functions in patients with chronic renal failure. Our study provides further support to earlier studies. We recommend clinicians to consider assessment of cognition as a prognostic factor in chronic renal failure patients.

Key words: Cognitive functions, Chronic renal disease

Introduction

Decreased mental alertness, impaired intelligence, attention and concentration and memory constitute cognitive dysfunction.[1] It was reported that cognitive functions of chronic renal failure patients was impaired but improved after dialysis.[1] The declined cognitive functions will diminish the quality life further in these patients. The underlying cause for the cognitive decline is not well established. However it was reported that, depression, delirium, mild cognitive impairment and dementia may be the factors which causes impaired cognition.[2] As most of the studies reported decline in the cognition levels, assessment of cognition levels may be used as prognostic factor.[3] Ischemia of the brain was reported to be the major factor to cause dementia in these patients.[4] The present study was undertaken to assess the cognitive functions in chronic renal failure patients.

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Materials and methods

Patients and controls

30 Patients with chronic kidney disease with renal failure, and 30 healthy, age matched controls, including both males and females at Hemodialysis centre, Andhra Medical college hospital, King George hospital, Visakhapatnam were included in the study after obtaining written and informed consent. The following criteria were followed while selecting the patients as cases

Inclusion and exclusion criteria:

Inclusion criteria

Willing male and female patients with diagnosis of chronic renal failure were included in the study.

Exclusion criteria

1. Patients with acute kidney injury and acute kidney disease were excluded from the study.
2. Unwilling patients

After recording the demographic information, all the healthy subjects (controls) and patients (cases) were familiarized with the cognition tests and recorded their cognitive functions.

Setting: The study was conducted at Department of General Medicine, Andhra Medical College, Vishakapatnam, Andhra Pradesh. All the values were recorded in the morning for the convenience of the participants.

Tests for assessment of cognitive functions

Verbal and spatial memory test: It was a standard test to assess spatial and verbal memory.[5]

The Mini Mental State Examination (MMSE): It is a tool that can be used to systematically and thoroughly assess mental status. It is an 11-question measure that tests five areas of cognitive function: orientation, registration, attention and calculation, recall, and language. The maximum score is 30. A score of 23 or lower is indicative of cognitive impairment. The MMSE takes only 5-10 minutes to administer and is therefore practical to use repeatedly and routinely.[6]

Statistical analysis: Data was analyzed by using SPSS 20.0 by using student "t" test. P value less than 0.05 was considered as significant.

Results

Table 1 presents demographic profile of the cases and controls. No significant difference was observed between cases and controls. Table 2 presents cognitive functions of cases and controls. Significant impaired MMS scores, spatial and verbal memory scores were observed in cases.

Table 1: Demographic profile of the cases and controls

Parameter	Cases	controls
Age*	52.82±6.44	51.91±7.53
Gender (Male: female)	18:12	23:7
Height*	155.61 ± 18.36	158.96 ± 19.55
Weight*	74±19.78	76±19.87

*Values are expressed in Mean ± SD. There is no statistically significant difference in between groups.

Table 2: Cognitive functions in cases and controls

Parameter	Cases	controls	P value
MMSE	16.0±3.43	23.00±4.62	<0.0001###
Spatial Memory	18.68±2.76	6.61±2.65	<0.0001###
Verbal Memory	3.99±2.11	7.2±1.75	<0.0001###

Data was expressed as Mean ± SD. (#P<0.05, ##P<0.01,###P<0.001)

Discussion

It was reported that dementia, is a common problem among patients with end-stage renal disease (ESRD). [7-11] However, the underlying cause was not well defined. In contrast, some studies reported that, there was no correlation between cognitive functions and renal disease. [12,13] Other studies reported that increasing severity of CKD is associated with progressive cognitive decline and this may have important clinical consequences.[14] Quality of life of individuals with impaired cognitive functions was decreased, and have more difficulty adhering to medications, and have worse survival.[15] In the present study we have observed severely impaired

MMSE, spatial and verbal memory in chronic renal failure patients when compared with healthy controls.

Limitations

The sample size of our study was less. Generalizations may not be possible as the study was conducted at one centre.

Conclusion

We have observed significant impaired cognitive functions in patients with chronic renal failure. Our study provides further support to earlier studies. We recommend clinicians to consider assessment of cognition as a prognostic factor in chronic renal failure patients.

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