COGNITIVE DYSFUNCTION IN CHRONIC KIDNEY DISEASE

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INTRODUCTION AND AIM:

Cognitive Dysfunction (CD) is an independent risk factor for cerebrovascular events, heart failure and cardiovascular death. The aim of this study is the detection and identification of CD (primary prevention) in patients with Chronic Kidney Disease (CKD).

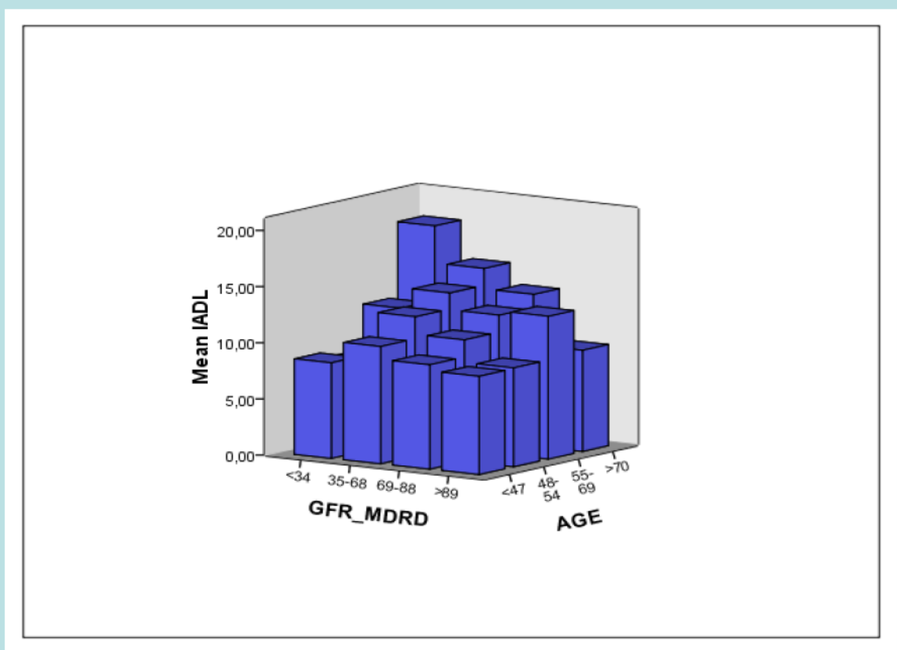
METHODS :

One hundred fifty-one patients were included in the study, of whom 44 patients with CKD stage I, 47 patients with stage II, 25 patients with stage III and 35 patients with stage IV. Cognitive function was evaluated with the Mini Mental State Examination (MMSE), Clock Drawing Test (CDT), and Instrumental Activity of Daily living (IADL). The mean age of the patients was 58.4 years (64.5% men).

TABLE & FIGURE:

Parameters	CKD 1 n=44	CKD 2 n=47	CKD 3 n=25	CKD 4 n=35	p value
Cognitive					
Mini mental state examination (best score 30)	21.8±3.3	20.7±4.8	20.5±4.6	18.7±6.7	0.08
Clock- test (best score 7)	6.8±0.5	6.6±0.9	5.8±1.1	5.3±1.8	<0.001
Instrumental activity of daily living (best score 9)	9.8±2.7	11.7±3.9	14.1±4.2	15.1±5.7	<0.001
Arterial parameters					
Brachial blood pressure					
Systolic BP, (mmHg)	137.3±9.8	139.4±12.7	142.8±12.8	137.2±18.1	ns
Diastolic BP, (mmHg)	84.7±9.8	81.8±10.7	78.6±22.4	77.4±11.3	0.01
Pulse pressure, (mmHg)	52.5±12.2	57.5±13.8	64.2±22.4	59.8±10.4	0.03
Mean BP, (mmHg)	102.2±10.3	101.9±9.4	100.5±10.3	97.3±10.4	ns
Aortic blood pressure					
Systolic BP, (mmHg)	128.3±14.8	128.1±23.1	131.9±13.3	130.2±17.5	ns
Pulse pressure,(mmHg)	41.9±12.8	47.7±21.2	53.1±17.2	53.4±17.1	0.01
Carotid blood pressure					
Systolic BP, (mmHg)	138.7±16.5	140.6±16.1	139.4±14.2	137.9±15.9	ns
Pulse pressure, (mmHg)	53.9±15.9	58.1±16.2	56.6±17.4	60.1±17.6	ns
cf -PWV, (m/sec)	6.3±1.5	6.7±1.8	6.1±1.9	6.9±2.3	ns
Augmentation index (%)	26.8±12.2	24.7±11.2	25.8±12.3	22.3±12.8	ns

Table



Figure

Results:

Sex ratio, education level and incidence of DM was comparable among CKD groups; however, patients in advanced CKD stages 3-4, were older and had an increased incidence of CVD disease. Patients in advanced CKD stages also exhibit an increased PP (brachial and aortic) with significant differences between the stages. No differences were found in systolic mean BP between the groups. Severe cognitive impairment was found in 3.8 % of patients with CKD stage I to III, whereas it was present in 19% of patients with CKD stage IV. For every change of CKD stages downwards, the risk of CD increases by 2.25 times. In CKD stage I through IV, there was a decrease by 3.1 points in MMSE (p<0.001), 1.5 points in CDT (p<0.001) and 5.3 points in IADL (p<0.001) respectively. (Figure 1) Multivariate analysis showed that independent factors contributing to CD in CKD were: *MMSE* : age (p <0.001), *CDT* : higher aortic pulse pressure (PP) (p<0.035) with negative impact, higher educational level (p<0.001) and higher glomerular filtration rate (p<0.001) with a positive one. *IADL*: age (p<0.001) and brachial PP (p<0.032) with positive impact, higher educational level (p<0.001) and glomerular filtration rate (p<0.001) with a negative one, respectively.

Conclusions:

- For every downward change in CKD stage, CD increases by 2.25 times.
- Severe CD in CKD I-III is present in 3.8% whereas in stage IV it is found in 19% of patients. The brain-protective role of antihypertensive drugs remains to be defined.

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