

Evaluation of chosen risk factors of the cardiovascular system in different stages of chronic kidney disease.

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OBJECTIVES

Chronic kidney disease becomes more and more important epidemiological, social and health problem worldwide. Disturbed renal function was observed in 16% of patients in the epidemiological PolNef 2004 survey conducted in Poland in 2004 which gives about 4.5 million of persons. It is estimated that the number of persons with chronic kidney disease will grow significantly every year. Extending life expectancy, growing CKD morbidity due to diabetes and arterial hypertension and too late recognition of early stages of chronic kidney disease and its risk factors are the most important reasons of such situation.

Cardiovascular disorders is the main cause of deaths amongst patients with chronic kidney disease. Mortality in this group of patients is about 10-20 times higher than that in general population. The aim of this study was to evaluate the prevalence of selected cardiovascular risk factors, such as age, sex, lipid disorders, hypertension, obesity, smoking, disorders of calcium and phosphate metabolism, anemia, inflammation in various stages of chronic kidney disease.

Moreover, the association between selected cardiovascular risk factors and thickening of the intima-media thickness (IMT), and the indicator of coronary artery calcification score (CACS-Calcium Score) in predialysis patients stage 2, 3 (3a and 3b) and stage 4 chronic kidney disease as well as between the thickening of the intima-media thickness (IMT) and the rate of coronary artery calcification score (CACS) in these patients were studied

METHODS

The study included 60 patients with chronic kidney disease in the predialysis stages hospitalized in the Department of Nephrology, Hypertension and Family Medicine, WAM University Hospital in Lodz. Chronic kidney disease stadium was determined on the basis of estimated (eGFR) calculated on the basis of abbreviated MDRD formula. Patients were divided in three groups. Group I consisted of 20 persons with GFR-MDRD 60-89 ml/min/1,73m² (mean age 58,3 ± 8,6) 12 men (mean age 58,1 ± 8,6) and 8 women (mean age 58,5 ± 9,0) Group II consisted of 20 persons with GFR-MDRD 30-59 ml/min/1,73m² (mean age 64,1 ± 12,6); 8 men (mean age 60,3 ± 12,9) and 12 women (mean age 66,6 ± 12,8). Group III consisted of 20 persons with GFR-MDRD 15-29 ml/min/1,73m² (mean age 60,5 ± 10,1); 10 men (mean age 58,1 ± 9,9) and 10 women (mean age 62,8 ± 10,0) The study analyzed data obtained in an patients, interview concerning the previous occurrence and treatment of hypertension, smoking and the duration of chronic kidney disease. Blood pressure measurement and anthropometric analyses evaluating height and weight were performed for each patient. Laboratory tests determining the concentration of hemoglobin, creatinine, total cholesterol, HDL cholesterol, LDL cholesterol, triglyceride, CRP, serum total calcium, inorganic phosphorus, parathyroid hormone were also made. In addition, all patients underwent ultrasound assessment of carotid intima-media thickness (IMT) and cardiac CT scan to evaluate indicator of coronary artery calcification score (CACS). Collected data was statistically analyzed using one-way analysis of variance (ANOVA) supplemented with the evaluation of simple effects, Kruskal –Wallis and chi² tests. Logistic regression was used to assess the relationship between discrete dependent variable and continuous or discrete independent variables.

RESULTS

parameter	unit	control group	group I	group II	group III	p
SBP	mmHg	126±8,7	135,8±14,7	138,8±10,6	139,8±10,1	0,0008
DBP	mmHg	76±7,4	79,2±12,0	81,8±7,7	82,5±8,8	0,1109
Hb	g/dl	14,1±0,9	14,3±1,1	12,8±1,4	12,3±2,0	<0,0001
cholesterol total	mmol/l	4,85±1,23	5,41±1,15	5,45±1,08	5,54±1,13	0,225
cholesterol LDL	mmol/l	2,89±1,19	3,08±1,10	3,29±1,24	3,25±0,9	0,6654
cholesterol HDL	mmo:l	1,39±0,33	1,32±0,33	1,32±0,36	1,23±0,4	0,5767
triglyceride	mmol/l	1,20±0,37	2,18±0,98	1,91±0,74	2,35±1,35	0,0006
Ca	mmol/l	2,42±0,12	2,40±0,12	2,36±0,14	2,22±0,3	0,0035
PO4	mmol/l	1,08±0,19	1,08±0,22	1,19±0,24	1,37±0,40	0,0032
PTH	pmol/l	4,88±1,97	4,72±1,64	5,68±2,61	13,68±6,77	<0,0001
CRP	mg/l	2,26±0,4	2,41±0,49	4,77±1,30	5,51±1,98	0,893
CACS	score	10,83 ±4,73	97,97±43,88	87,99±20,51	197,36±79,81	0,007
IMT	mm	0,69±0,03	0,73±0,03	0,86±0,04	0,87±0,04	0,0005
smoking	%	20	25	25	50	

Results of antropometric parameters

parameter	unit	control group	group I	group II	group III	p
height	m	1,71±0,12	1,70±0,11	1,68±0,08	1,69±0,09	0,812
weight	kg	73,8±12,1	80,8±16,4	83,0±18,4	81,0±14,3	0,264
BMI	kg/m ²	25,3±4,2	27,8±3,5	29,1±5,1	28,3±4,4	0,039

CONCLUSIONS

1. Analysis of appearing of the cardiovascular risk factors in the examined group in different stages of chronic kidney disease showed the presence of the following risk factors, age, obesity, lipid disorders, hypertension, smoking.
2. Age, co-occurrence of hypertension affect the growth of the intima-media thickness (IMT) in patients with chronic kidney disease.
3. Age, exposure to tobacco smoke is associated with the increase in calcification score (CACS) in patients with chronic kidney disease.
4. Thickening of the intima-media thickness (IMT) influence the increase in calcification score in the patients with chronic kidney disease.

REFERENCES:

1. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney. Kidney International 2012. 2. Król E, Rutkowski B, Czarniak P et al. Early detection of chronic kidney disease: results of the PolNef study. Am J Nephrol. 2009 February; 29(3): 264–273. 3. Rutkowski B, Czekalski S, Sułowicz W i wsp. Epidemiologia chorób nerek w Polsce - program pilotażowy (PolNef). Przegl Lek. 2004;61(1):22-4. 4. Yamagata K, Ishida K, Sairenchi T et al. Risk factors for chronic kidney disease in a community-based population: a 10-year follow-up study. Kidney Int .2007; 71: 159–166

