PREDICTORS OF THE DEVELOPMENT OF CARDIORENAL PATHOLOGY IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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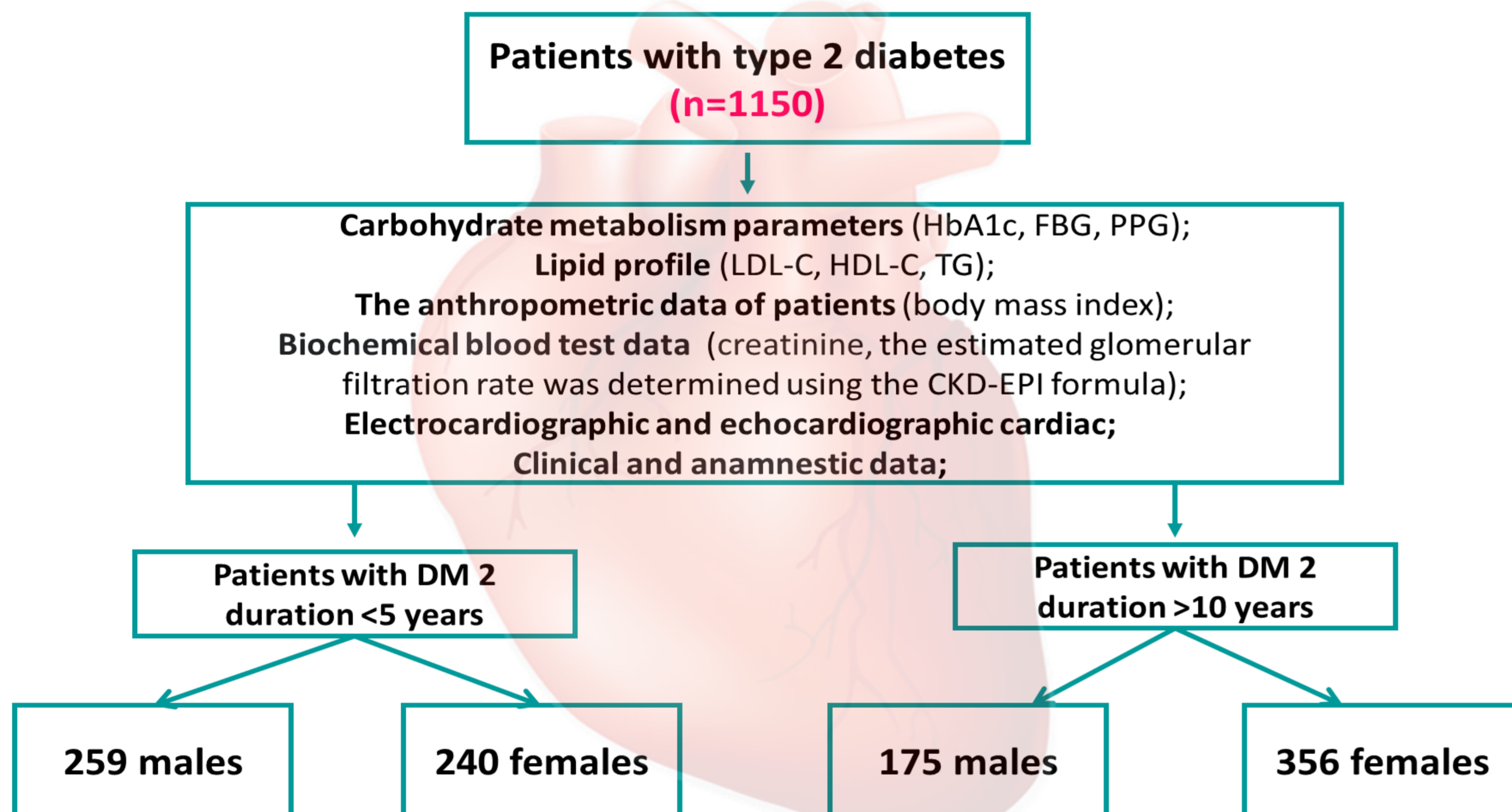1. Moscow Department of Health V.P. Demikhov Hospital

INTRODUCTION

At present much attention has been paid to the study of the mutual influence of cardiovascular system (CVS) pathology and chronic kidney disease (CKD) in patients with type 2 diabetes mellitus (t2DM)

The aim: To evaluate the prevalence of atherosclerotic CVD (ASCVD), CHF, and CKD in patients with different duration of t2DM hospitalized for inpatient treatment and to study the factors of their early development and progression.

MATERIALS AND METHODS

Study design

Patients with type 2 diabetes (n=1150)

Carbohydrate metabolism parameters (HbA1c, FBG, PPG);
Lipid profile (LDL-C, HDL-C, TG);
The anthropometric data of patients (body mass index);
Biochemical blood test data (creatinine, the estimated glomerular filtration rate was determined using the CKD-EPI formula);
Electrocardiographic and echocardiographic cardiac;
Clinical and anamnestic data;

Patients with DM 2 duration <5 years		Patients with DM 2 duration >10 years	
259 males	240 females	175 males	356 females

The study included 1150 patients with t2DM (483 males and 667 females). Carbohydrate metabolism parameters were analyzed by the level of glycated hemoglobin (HbA1c), fasting blood glucose (FBG) and postprandial glucose (PPG). Lipid profile was assessed by low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C) and triglycerides (TG). The anthropometric data of patients (body mass index) were also assessed, and the estimated glomerular filtration rate was determined using the CKD-EPI formula. Electrocardiographic and echocardiographic cardiac examination were performed. Statistical data processing was performed using the statistical software package "Excel" ("Microsoft"), the program "Statistica 10" ("Statsoft Inc").

RESULTS

According to logistic regression analysis, the most significant factors associated with the development of ASCVD were more than 10 years of experience (OR 4.39 (95% CI: 2.48-7.76) (p>0.001)) and arterial hypertension (AH) (OR 3.82 (95% CI: 2.80-5.21), age over 60 years (OR 2.03 (95% CI: 1.43-2.88) (p>0.001), male gender (OR 1.54 95% CI: 1.12-2.13) (p>0.001)) and CKD (OR 1.57 (95% CI: 1.15-2.16) (p>0.001)). The most significant factors that increased the likelihood of CHF were age of patients more than 60 years (OR 4.54 (95% CI: 3.11-6.62), (p>0.001)), AH (OR 2.05 (95% CI: 1.20- 3.51) and female gender (OR 1.79 (95% 1.31-2.46). Similar results were observed for CKD, age over 60 years increased the likelihood of CKD by 3,66 (95% ДИ: 2,56-5,22), in patients with AH and by 2.05 (95% CI: 1.20- 3.51) and female gender 1.79 (95% CI: 1.31-2.46). The presence of obesity increased the odds of CHF alone by 2.19 (1.55-3.10), (p>0.037) and was not associated with ASCVD and CKD in our data. In addition, DM duration increased the risks of CKD (OR 1.74 (95% CI: 1.27-2.38) (p>0.001)) and ASCVD more than 4-fold, but not of CHF (p=0.144).

RESULTS

Factors			95% CI	p
DM 2 duration >10 years			4,39 [2,48;7,76]	0,001
Arterial hypertension			3,82 [2,80;5,21]	0,001
Age over 60 years			2,03 [1,43;2,88]	0,001
CKD			1.57 (1.15-2.16)	0,001
Male gender			1,54 [1,12;2,13]	0,008
Dyslipidemia			1,13 [0,7;1,35]	0,878
HbA1c			0,97 [0,86;1,56]	0,100
Obesity			0,95 [0,7;1,28]	0,758

According to logistic regression analysis, the most significant factors associated with the development of ASCVD

Factors			95% CI	p
Age over 60 years			4,54 [3,11;6,62]	0,001
Atrial fibrillation			2,93 [1.79–4,78]	0,001
Arterial hypertension			2,19 [1,20;3,51]	0,008
Obesity			2,05 [1,55;3,10]	0,001
CKD			1,81 [1,24–2,65]	0,002
Female gender			1,51 [1,07;2,49]	0,013
DM 2 duration >10 years			1,35 [0,92–1,97]	0,144
Dyslipidemia			1,32 [0,47;1,58]	0,093
HbA1c			0,96 [0,87;1,51]	0,387

According to logistic regression analysis, the most significant factors associated with the development of CHF

Factors			95% CI	p
Age over 60 years			3,66 [2,56;5,22]	0,001
Arterial hypertension			2,05 [1,20;3,51]	0,009
Famale gender			1,79 [1,31;2,46]	0,001
DM 2 duration >10 years			1,74 [1,27;2,38]	0,004
Obesity			1,04 [0,77;1,42]	0,761
Dyslipidemia			0,97 [0,51;1,24]	0,069
HbA1c			0,96 [0,86;1,03]	0,101

According to logistic regression analysis, the most significant factors associated with the development of CKD

Factors	ASCVD	CHF	CKD
Arterial hypertension	++++ OR 3,82	+++ OR 2,93	++ OR 2,05
Age over 60 years	++ OR 2,03	++++ OR 4,54	+++ OR 3,66
DM 2 duration >10 years	+++ OR 3,82		++ OR 1,74
Obesity		++ OR 2,05	
Female gender		+ OR 1,5	++ OR 1,79
Male gender	+ OR 1,54		

According to logistic regression analysis, the most significant factors associated with the development of ASCVD, CHF, CKD patients with of t2DM

CONCLUSIONS

Based on the analysis, risk factors associated with cardiovascular and renal complications in patients with t2DM were established. The most significant risk factors for the development of ASCVD were diabetes duration, AH and male gender. Such factors as age> 60 years, AH and female gender were associated with increased chances of CHF and CKD. The presence of obesity increased the odds of CHF.