Clinical dynamics of nephropathy in patients with diabetes mellitus type 2 and concomitant essential hypertensive disease

Author: Aloysius Ikwuka

Aims

To study the clinical changes of kidney damage in patients with diabetes mellitus type 2 (DM2) and concomitant essential hypertensive disease (EHD).

Methods

One-hundred and five patients were examined for 3 months: 35 patients with EHD stage II compensated by treatment (Group I), 35 patients with subcompensated DM2 [glycosylated haemoglobin (HbA_{1C}) – from 7.0% to 11.0%] (Group II) and 35 patients with subcompensated DM2 [HbA_{1C} – from 7.0% to 11.0%] and concomitant EHD (Group III). Among the patients examined, there were 55 females and 50 males, the average age was 59.8±5.3 years. The control group consisted of 20 healthy volunteers. Groups examined were randomised in age, sex, body mass index, duration of DM2 and EHD. Determination of microalbuminuria (MAU), glomerular filtration rate (GFR), HbA_{1C}, serum lipid levels, blood pressure monitoring etc were carried out.

Results

MAU was observed in 20.0% of Group I patients, in 52.0% of Group II patients and in 72.0% of Group III patients. The average level of albumin excretion in urine (MAU) in Group III patients was greater when compared with healthy volunteers by 87.54% ($p<0.05$), in Group I patients by 66.09% ($p<0.05$) and in Group II patients by 31.04% ($p<0.05$). Microalbuminuria level of 50 mg/mL was observed in Group I patients – 4.0% of cases, in Group II patients – 32.0% of cases and in Group III patients – 48.0% of cases ($p<0.05$). In addition, 16.0% of Group II patients and 28.0% of Group III patients revealed slightly pronounced proteinuria – up to 0.66 g/L.

Most reduced GFR was in Group III patients (67.7±4.8) mL/min, which was lower when compared with healthy at 37.72% ($p<0.05$), in Group I patients – 28.06% ($p<0.05$) and in Group II patients – 48.00% ($p<0.05$).

The HbA_{1C} level as an indicator of the course of diabetes in Group III patients was 8.83±0.40%, and exceeded the figure for the healthy by 47.68% ($p<0.05$), in Group I – by 45.87% ($p<0.05$) and in Group II – by 12.34% ($p<0.05$), indicating a more pronounced disturbance of glucose metabolism in patients with DM2 and concomitant EHD.

In particular, in Group III patients total cholesterol (TC) increased by (6.89±0.35) mmol/L ($p<0.05$) when compared with healthy volunteers and exceeded that of Group I patients by 19.88% ($p<0.05$) and Group II patients by 10.16% ($p<0.05$). Triglycerides (TG) in Group III patients were 2.47±0.21 mmol/L ($p<0.05$) when compared with healthy volunteers and exceeded that of Group I by 26.32% ($p<0.05$) and Group II by 10.93% ($p<0.05$). Low-density lipoproteins (LDL) in Group III patients were was 3.59±0.25 mmol/L ($p<0.05$) when compared with healthy and exceeded that of Group I by 25.35% ($p<0.05$) and Group II by 12.26% ($p<0.05$). Antiatherogenic high-density lipoproteins (HDL) were reduced in Group III and were 1.13±0.08 mmol/L ($p<0.05$) when compared with healthy and was lower than that of Group I by 16.30% ($p<0.05$) and Group II by 7.38% ($p<0.05$).

The correlation coefficient (r) between systolic blood pressure (SBP) and TC – ($r = +0.41$; $p<0.05$), between SBP and MAU – ($r = +0.32$; $p<0.05$), between SBP and GFR – ($r = -0.35$; $p<0.05$); between LDL and SBP – ($r = + 0.49$; $p<0.05$), between LDL and MAU – ($r = + 0.41$; $p<0.05$), between LDL and GFR – ($r = -0.38$; $p<0.05$); between TG and SBP – ($r = +0.52$; $p<0.05$), between TG and MAU – ($r = + 0.45$; $p<0.05$), between TG and GFR – ($r = -0.40$; $p<0.05$), indicating the influence of lipid metabolism not only on the clinical course of DM2 and EHD, but also a disturbance of kidney function in the presence of comorbidity.

Conclusion

To study the clinical dynamics of nephropathy in patients with DM2 and concomitant EHD, it is necessary to constantly monitor the MAU, GFR, HbA_{1C}, serum lipid levels and blood pressure. ■

Conflict of interest statement

The author has no conflict of interest to declare.

Author: National Medical University Ukraine