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Renal function and glycemic control in metformin-treated diabetic patients - a cross-sectional study

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Background: Glycemic control has an important role retarding development of vascular complications of Type 2 diabetes mellitus (T2DM), like diabetic nephropathy. Gold-standard medication is metformin, although it is contraindicated at kidney dysfunction (in Portugal: creatinine clearance - ClCr - below 60 ml/minute) because of lactic acidosis risk. However there are some evidences about a possible use at lower dosis for ClCr of 30 to 60 ml/min.

Aim: evaluate kidney function and glycemic control among metformin-treated T2DM patients.

Methods: Descriptive, analytical and cross-sectional study at one primary health care unit. Simple random sample of metformin-treated T2DM patients in 2014. Variables: age, sex, weight, creatininemia, glomerular filtration rate (GFR) calculated by Cockcroft-Gault formula; glycated hemoglobin (HbA1c).

Results: A sample of 195 metformin-treated T2DM patients was obtained (mean age 68 ± 11). Most of them (44.1%) were treated with metformin plus one oral antidiabetic medication. Mean HbA1c, GFR and creatininemia were $6.9 \pm 1.0\%$, 97 ± 35 ml/min e 0.82 ± 0.2 mg/dl, respectively. 12.8% had moderate Chronic Kidney Disease (CKD) - GFR between 30-60 ml/min. One patient had GFR below 30ml/min. T2DM patient prevalence of glycemic control (HbA1c below 7%) was 61.5% (GFR \geq 60) and 68.0% (moderate CKD). There was statistically significant differences at mean age ($p=0.00$) but not at HbA1c mean and glycemic control among different CKD stage groups of patients, as between creatininemia and glycemic control.

Conclusion: There was only one patient with absolute contraindication of metformin use, although there was a non-negligible prevalence of moderate CKD. A significant trend for kidney dysfunction with ageing was observed, compatible with diabetes natural history, although significant differences between glycemic control and renal function were not observed. Renal protective and/or other antidiabetic medications optimized for renal function can partially explain those results. Biases of selection, information and calculation of GFR at obese patients have to be taken in consideration while interpreting results.