Appropriateness of metformin prescription for type 2 diabetes mellitus patients with chronic kidney disease (Stages 3-5)

ABSTRACT

Introduction: Metformin is the first-line pharmacological therapy for type 2 diabetes mellitus (T2DM). Guidelines recommend metformin to be given at reduced dosages for those with an estimated glomerular filtration rate (eGFR) <60 mL/min/1.73m2 and omitted in those with eGFR<30 mL/min/1.73m2. Lactic acidosis is a known complication of those on metformin. This study aimed to determine the appropriateness of metformin prescription in T2DM patients with chronic kidney disease (CKD) stages 3-5 in a tertiary centre in Malaysia. Materials and methods: A cross-sectional design using retrospective secondary data of T2DM patients on metformin attending nephrology and diabetic clinics in the year 2017. eGFR calculated using the CKD-EPI formula identified those in CKD stage 3-5 defined using the National Kidney Foundation-Kidney Disease Outcomes Quality Initiative criteria. Metformin prescription was considered appropriate when the metformin maximum daily dosage does not exceed 1500 mg in CKD stage 3a and 1000 mg in CKD stage 3b and metformin stopped in CKD stages 4 and 5. Results: A total of 143 patients were included. Majority were in the elderly age group (62.9%), male (60.8%) and had concurrent hypertension (85.3%). Median HbA1c was 8.3% (67 mmol/mol) with most patients (88.8%) having HbA1c above 6.5% (48 mmol/ mol). Majority (92.3%) were categorised as stage 3 CKD. Eleven (7.7%) subjects had inappropriate metformin prescription. Seven of nine (78%) subjects in CKD stage 4 were on metformin with a maximum daily dose of 500 mg to1000 mg. Three patients had serum lactate measured. Conclusion: The majority of CKD patients had appropriate metformin prescription. However, a considerable number of CKD stage 4 patients continued to be on metformin. The many benefits of metformin may be a reason why it is still continued against recommendations. Only three patients had lactate measured which, although may suggest that lactic acidosis is not a common occurrence, the potential for metformin-associated lactic acidosis especially in those at risk should be considered.

Keyword: Metformin; Chronic kidney disease; Diabetes mellitus; Lactic acidosis