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Glycemic control with intensive insulin therapy is fundamental to prevention of End Stage Renal Disease in diabetes

Aim: Diabetes is the most common cause of end stage renal disease (ESRD) and the target population in the dialysis clinics. An important question is why do so many diabetes patients develop ESRD and enter into dialysis? Our previous and other studies imply that over-enthusiastic use of angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocking (ARB) drugs contribute to the high incidence of ESRD in diabetes. Thus our aim was to investigate if ESRD in diabetes is preventable by glycemic control with intensive insulin therapy but with exclusion of ACEI/ARB drugs.

Methodology: Data was obtained from 46 patients, 28 female, 18 male, with established diabetes treated in the office setting. Mean age was 62.2 years (range 39-86 years) and were followed for an average period of 14.2 months (range 1.5 to 115 months). Diabetes was diagnosed by 2-h postprandial glucose level of >200 mg/dL (>11.1 mmol/L). They were treated with Glargine or detemir insulin after breakfast and dinner and supplements of regular insulin based on finger-stick glucose 2-h post meal and at bedtime. Blood pressure control was achieved with anti-hypertensive therapy but with complete exclusion of ACEI/ARB drugs. Laboratory data includes glucose, urea nitrogen, serum creatinine (Scr), estimated glomerular filtration rate (eGFR), glycosylated hemoglobin (HbA_1c) and blood pressure. The values for each parameter were compared between the first and last visits using a paired two-tailed test. $P<0.05$ was considered significant. Patients were divided on the basis of 2hPP glucose of more or less than 11.1 mmol/L.

Results: Glucose at the last visit was significantly lower (8.4+0.6 mmol/L) than the first visit (10.3+5.2 µmol/L) in all the patient groups associated with signiticantly reduced Scr in the last visit (100.5+5.2 µmol/L) compared to the first visit (110.9+7.8 µmol/L). There was little change in eGFR between the first and last visit in all groups. Average eGFR was consistent with chronic kidney disease (CKD) stage 1 in patients in all groups at the last visit. Less than half of the 46 patients achieved glucose control of <11.1 mmol/L with highly significant reduction of HbA1c (9.14+0.52 vs. 7.60+0.45, $p<0.0148$) in the <11.1 mmol/L group. In that group renal function at the last visit was improved from CKD stage 2 to CKD stage 1, but the difference was not significant between the two visits. Blood pressure range was normal (<140 mmHg systolic and <80 mmHg diastolic) in both visits in all groups, but the diastolic blood pressure at the last visit in all the patient groups was significantly lower that the first visit (81.6+1.9 vs. 77.0+1.5 mmHg, $p<0.0297$).

Conclusion: Thus the paradigm of therapy for glycemic and blood pressure controls presented in this study is proven to be effective in renal preservation over time in diabetes.

Keywords: *Diabetes mellitus, ACEI/ARB, Glargine insulin, Renal preservation, Blood pressure*

Biography

Anil K. Mandal is a native of India and a naturalized citizen of the United States. He is board certified in Internal Medicine and Nephrology (kidney disease and hypertension). He is an author of a dozen books and more than 100 published articles on research in diabetes and kidney disease. He is a two-time Fulbright Scholar and a visiting professor in 23 countries that invited him to lecture on diabetes, high blood pressure, and kidney diseases.

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