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Left ventricular diastolic dysfunction and its clinical correlates in patients of type 2 Diabetes Mellitus with nephropathy

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Objectives: Diastolic dysfunction is the earliest marker of incipient diabetic cardiomyopathy and is often missed in routine evaluation. The purpose of this study was to assess the prevalence and risk factors for diastolic dysfunction (DD) in patients with diabetic nephropathy (DN).

Methods: This observational study was conducted on 200 diabetic patients, of which 100 patients had diabetic nephropathy. Clinical evaluation, biochemical profile and echocardiographic parameters for diastolic function (mitral E/A, DT, IVRT & E/E') were studied in all study participants.

Results: Patients with diabetic nephropathy (DN) were older, had a longer duration of diabetes and were more obese than patients without nephropathy. Nephropathy patients had more severe grades of diabetic retinopathy. Peripheral neuropathy (59% v/s 40%), PAD (63% v/s 47%) & hypertension (64% v/s 48%) was more in DN patients.

Diastolic dysfunction was more prevalent and severe in DN patients (72% v/s 49%). Patients with DD had longer duration of diabetes, higher waist circumference and poor glycaemic control. All the diastolic parameters (mitral E/A,DT,IVRT & E/E') were significantly worse in diabetic nephropathy (mean mitral E/A 1.3 ± 0.5 v/s 1.1 ± 0.4 ; DT 174 ± 19.9 v/s 181.3 ± 17.5 ms; IVRT 78 ± 17.5 v/s 80.5 ± 16.4 ms; E/E' 9.4 ± 3.4 v/s 8.2 ± 2.7) ($p < 0.05$). Pair wise analysis revealed that DD differed significantly with respect to eGFR and proteinuria. The risk factors for development of diastolic dysfunction include macroalbuminuria (OR 11.5,95% CI 3.3-39.8), diabetes duration >10years (OR 11.25,95% CI 4.5 – 28.1) & ESRD (OR 8.5,95% CI 1.1 – 68.8). Other determinants were age > 60 years, hypertension, eGFR<60ml/min/m² and microalbuminuria.

Conclusions: Present study reveals a very high prevalence of diastolic dysfunction especially in patients with diabetic nephropathy. The presence of DD in early nephropathy portends a worse prognosis from a cardiovascular point of view.