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Role of angiotensin converting enzymes inhibitor and angiotensin receptor blockers in Type-1 diabetic nephropathy

Nasim Musa
NIPROJMI Dialysis Center Limited, Bangladesh

Background: Patients with Insulin Dependent Diabetes Mellitus (IDDM) posses high risk of developing diabetic nephropathy. The goals of treatment of diabetic nephropathy are to slow the progression of kidney damage and control related complications. Studies have shown that Angiotensin Converting Enzymes Inhibitor (ACEI) and Angiotensin Receptor Blockers (ARB) are beneficial in reducing the progression of microalbuminuria in normotensive patients with Type-1 diabetes. Current efforts are to perform a systematic review of available published evidence regarding role of ACEI and ARB in Type-1 diabetic nephropathy and to assess whether these drugs are helpful in improving renal function, slowing progression of chronic renal failure in patients IDDM with nephropathy.

Methods: PubMed search was initially conducted. Search terms 'Angiotensin Converting Enzymes Inhibitor' and 'Angiotensin Receptor Blockers' and 'Type-1 diabetic nephropathy' were explored. Search term 'diabetic nephropathy' was restricted to treatment or prevention. Exploding the drug group, individual drug name was used for search and then each individual search was combined with 'diabetic nephropathy'. Combined search of previous searches were restricted to English language and found 102 studies and after excluding reviews only few were found to be eligible, as most lies bottom in the list of hierarch of study design for establishing evidence. Subsequently EMBASE and Cochrane search failed to reveal additional relevant articles. Hence, references of the available literature and books were tracked to find covert literatures employing snowballing method. Total of 14 papers were initially identified. Of which 7 randomized control trials, 1 cohort study and 1 clinical audit (total 9 studies) were finally selected for review maintaining optimum soundness in methodology and relevancy of the question. Effort was made to restrict publication bias to its minimum.

Results: ACEIs (Perindopril, captopril and Lisinopril) were found to exert a potential reno-protective effect and slowing of the progression to renal disease in normotensive normoalbuminuric IDDM patient in most studies. However, in several studies Enalapril and Losartan did not show any reno-protective effect. In IDDM patients with clinically evident nephropathy Captopril showed to slow the decrease of renal function. Aggressive antihypertensive treatment was found to induce remission and regression in patient with Type-1 diabetic nephropathy in several studies. Combination of ACEI and ARB also found to offer additional renal and cardiovascular protection in patient with Type-1 diabetic nephropathy in several papers. Few other studies ruled out such renal protection with combined therapy. Long-term treatment with Lislnopril or Nisoldipine exerts similar beneficial effects on progression of Type-1 diabetic nephropathy in hypertensive patient.

Conclusion: The evidence regarding role of ACEI and ARB is far from conclusive. Heterogeneity of patient characteristics and of definition of both exposure and outcome made the extraction of study finding difficult. Further studies as well as review could unveil definitive evidence regarding role of ACEI and ARB for prevention as well as for treatment of diabetic nephropathy in IDDM patient.

Biography

Nasim Musa is serving as Medical Director and Chief Consultant, NIPRO JMI Dialysis Center Limited, Bangladesh. He is board certified in MBBS at Dhaka University, and M. MED Science in Nephrology at university of Sheffield, UK

writeporosh@yahoo.com

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