World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:10, No:05, 2016

Total Plaque Area in Chronic Renal Failure

Authors : Hernán A. Perez, Luis J. Armando, Néstor H. García

Abstract : Background and aims Cardiovascular disease rates are very high in patients with renal failure (CRF), but the underlying mechanisms are incompletely understood. Traditional cardiovascular risk factors do not explain the increased risk, and observational studies have observed paradoxical or absent associations between classical risk factors and mortality in dialysis patients. A large randomized controlled trial, the 4D Study, the AURORA and the ALERT study found that statin therapy in CRF do not reduce cardiovascular events. These results may be the results of 'accelerated atherosclerosis' observed on these patients. The objective of this study was to investigate if carotid total plaque area (TPA), a measure of carotid plaque burden growth is increased at progressively lower creatinine clearance in patients with CRF. We studied a cohort of patients with CRF not on dialysis, reasoning that risk factor associations might be more easily discerned before end stage renal disease. Methods: The Blossom DMO Argentina ethics committee approved the study and informed consent from each participant was obtained. We performed a cohort study in 412 patients with Stage 1, 2 and 3 CRF. Clinical and laboratory data were obtained. TPA was determined using bilateral carotid ultrasonography. Modification of Diet in Renal Disease estimation formula was used to determine renal function. ANOVA was used when appropriate. Results: Stage 1 CRF group (n= 16, 43±2yo) had a blood pressure of 123±2/78±2 mmHg, BMI 30±1, LDL col 145±10 mg/dl, HbA1c 5.8±0.4% and had the lowest TPA 25.8±6.9 mm2. Stage 2 CRF (n=231, 50±1 yo) had a blood pressure of 132±1/81±1 mmHg, LDL col 125±2 mg/dl, HbA1c 6±0.1% and TPA 48±10mm2 (p< 0.05 vs CRF stage 1) while Stage 3 CRF (n=165, 59±1 yo) had a blood pressure of 134±1/81±1, LDL col 125±3 mg/dl, HbA1c 6±0.1% and TPA 71±6mm2 (p < 0.05 vs CRF stage 1 and 2). Conclusion: Our data indicate that TPA increases along the renal function deterioration, and it is not related with the LDL cholesterol and triglycerides levels. We suggest that mechanisms other than the classics are responsible for the observed excess of cardiovascular disease in CKD patients and finally, determination of total plaque area should be used to measure effects of antiatherosclerotic therapy.

Keywords : hypertension, chronic renal failure, atherosclerosis, cholesterol
Conference Title : ICA 2016 : International Conference on Atherosclerosis
Conference Location : London, United Kingdom
Conference Dates : May 23-24, 2016