



Abstract Type : Oral presentation

Abstract Submission No.: A-0678

Abstract Topic : Dialysis

A Case-Control Study Investigating Cardiovascular Health in Maintenance Hemodialysis Patients through Oxidative Stress Biomarkers and Carotid Artery Intima-Media Thickness

Muhammad Tassaduq Khan

Department of Internal Medicine-Nephrology, Dow university hospital , Pakistan

Objectives : This study aims to evaluate biomarkers of oxidative stress (OS) and carotid artery intima-media thickness as predictors of cardiovascular health among MHD patients

Methods : We divided 135 participants in this prospective case-control study into three groups: group A included 45 healthy controls, group B included 45 ESRD patients receiving MHD for less than three years, and group C included 45 ESRD patients receiving MHD for more than three years. Participants aged 18–50 years, not taking antioxidant supplements, and willing to participate were included, excluding those with chronic illnesses, prior cardiac disease, or acute renal failure. Data collected included demographics, MHD duration, medical history, lipid profile, common carotid artery intima-media thickness (CCA-IMT), and some biochemical parameters such as oxidized LDL (Ox-LDL), malondialdehyde (MDA), and superoxide dismutase (SOD).

Results : This study included 135 participants divided into three groups (A, B, and C) based on the MHD duration. Significant differences were observed in OS markers and lipid profiles across the groups ($p < 0.001$). Group C exhibited the highest levels of Ox-LDL and MDA, indicating increased OS, and the lowest SOD levels compared to groups A and B. Positive correlations were found between Ox-LDL and LDL-cholesterol (LDL-C) levels, with the strongest correlation in group C ($r = 0.684$, $p < 0.05$). CCA-IMT progressively increased from group A to group C, with significant differences in right, left, and mean CCA-IMT ($p < 0.001$). Multivariate analysis revealed a positive association between Ox-LDL levels and CCA-IMT ($p < 0.01$).

Conclusions : Increased OS, evident by elevated Ox-LDL and reduced antioxidant levels, is linked to unfavorable lipid profiles and carotid atherosclerosis progression in MHD patients. Prolonged MHD duration contributes to heightened OS and increased atherosclerosis development. Ox-LDL emerges as a predictor of CVD risk in this population.