Impact of Hemodialysis on Serum Fluorescent Advanced Glycation End-products in End-stage Renal Disease Patients

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Abstract

Introduction: Serum fluorescent advanced glycation end-product (AGE) levels are independent predictors of cardiovascular and all-cause mortality risks in end-stage renal disease (ESRD). The present study aimed to estimate the impact of hemodialysis (HD), a common treatment modality, on serum fluorescent AGEs. **Materials and Methods:** 68 ESRD HD patients were included in the cross-sectional study, which had 37 non-diabetics and 31 diabetics. Serum fluorescence of total, Pentosidine, and low molecular weight (LMW) AGEs were measured pre- and post-HD. **Results:** Paired *t*-test comparisons showed significant decreases in post-HD fluorescence of total AGEs (by 1394.3 arbitrary units [AU]), Pentosidine (by 1028.5 AU), and LMW AGEs (by 328.2 AU); $P < 0.001$, compared to their pre-HD levels in the ESRD patients. Independent t-test comparisons showed significantly higher pre-HD total AGEs in non-diabetic than in diabetic ESRD patients (4639.9 AU vs. 3857.16 AU; $P = 0.004$). Pre-HD Pentosidine level was also significantly higher in non-diabetic than in diabetic ESRD patients (3072.97 AU vs. 2513.01 AU; $P = 0.009$) who took antidiabetic medications. **Discussion:** These findings demonstrate the positive impact of the given standard HD therapy in decreasing AGE levels and potentially, the AGE-associated risks. Lower pre-dialysis AGE levels observed in diabetic patients receiving antidiabetic therapy suggest a potential adjunctive protective effect that warrants further investigation. **Conclusion:** HD significantly reduces AGE levels in ESRD patients, underscoring its beneficial role in mitigating AGE-associated cardiovascular risk. The higher AGE levels in non-diabetic ESRD patients emphasize the need for subgroup-specific therapeutic strategies.

Key words: Advanced-glycation-end-products, end-stage renal disease, hemodialysis, low-molecular-weight advanced glycation end products, pentosidine, serum fluorescence