CIRCULATING ALPHA-TOCOPHEROL AND INSULIN SENSITIVITY AMONG ELDERLY MEN WITH CHRONIC KIDNEY DISEASE

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Introduction and Aims: Modifiable risk factors can contribute to the insulin resistance and hyper-insulinemia that are commonly observed in individuals with chronic kidney disease (CKD). Evidence in the general population suggests that vitamin E supplementation may improve both insulin sensitivity and secretion. We here hypothesize that hypovitaminosis E, a common deficiency in CKD, is an additional risk factor for insulin resistance.

Methods: Cross-sectional analysis including 273 non-diabetic men aged 70-71 with CKD (defined as either cystatin-C estimated glomerular filtration rate (eGFR) <60 mL/min/1.73m2 or urinary albumin excretion rate ≥20 µg/min). Insulin sensitivity index (M/I ratio) was measured by euglycemic clamps. Serum alpha, beta and gamma tocopherol concentrations were quantified by high-performance liquid chromatography (HPLC). Dietary vitamin E intake was estimated from 7-day dietary records. Uni- and multivariate regression models were fitted to assess the potential association between M/I and tocopherols.

Results: The mean serum alpha-tocopherol was 1.61±0.28 mg/mmol, eGFR was 52.9 (IQR, 46.9 - 57.7) mL/min/1.73m2 and UAER was 5.7 (IQR, 3.4 - 26.3) µg/min. In fully-adjusted multivariable regression analyses, serum alpha-tocopherol levels were positively associated with M/I (standard β=0.18, P=0.001). No association was observed for serum beta and gamma-tocopherol concentrations.

Conclusions: Serum alpha-tocopherol concentration was associated with gold-standards of insulin sensitivity in non-diabetic older men with CKD. This is consistent with the hypothesis that vitamin E supplementation may improve insulin sensitivity in this patient population.