

Skin autofluorescence is associated with renal function and cardiovascular diseases in pre-dialysis chronic kidney disease patients.

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BACKGROUND: Tissue accumulation of advanced glycation end-products (AGE) is thought to be a contributing factor to the progression of cardiovascular disease (CVD). Skin autofluorescence, a non-invasive measure of AGE accumulation using autofluorescence of the skin under ultraviolet light, has shown associations with CVD in haemodialysis patients. The present study aimed to evaluate relationships of skin autofluorescence to renal function as well as CVD in pre-dialysis patients with chronic kidney disease (CKD).

METHODS: Subjects in this cross-sectional analysis comprised 304 pre-dialysis CKD patients [median age, 62.0 years; median estimated glomerular filtration rate (eGFR), 54.3 mL/min/1.73 m²; diabetes, n = 81 (26.6%)]. AGE accumulation in skin was assessed by skin autofluorescence using an autofluorescence reader. Relationships between skin autofluorescence, eGFR, CVD history and other parameters were evaluated.

RESULTS: Skin autofluorescence correlated negatively with eGFR ($r = -0.42$, $P < 0.01$) and increased as CKD stage advanced. Multiple regression analysis revealed significant correlations of skin autofluorescence with age, presence of diabetes, eGFR and CVD history in CKD patients ($R^2 = 30\%$). Age, male gender, smoking history, skin autofluorescence and eGFR were significantly correlated with CVD history, and multiple logistic regression analysis identified age [odds ratio (OR), 1.09; 95% confidence interval (CI), 1.03-1.15; $P < 0.01$], history of smoking (OR, 6.50; 95%CI, 1.94-21.83; $P < 0.01$) and skin autofluorescence (OR, 3.74; 95%CI, 1.54-9.24; $P < 0.01$) as independent factors.

CONCLUSIONS: Tissue AGE accumulation measured as skin autofluorescence increased as GFR decreased and was related to CVD history in CKD patients. Non-invasive autofluorescence readers may provide potential markers for clinical risk assessment in pre-dialysis CKD patients.

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