Circulating Chymase and Chronic Kidney Disease: A Multivariable Analysis of Current Treatments, Demographics, and Clinical Risk Factors

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Chronic kidney disease (CKD) results in a progressive loss of kidney function over time, affecting 37 million in the US. Chymase is the primary enzyme mediating angiotensin II formation independent of the angiotensin-converting enzyme, and it promotes accumulation of inflammatory cells and may cause renal fibrosis. This novel study investigated differences in chymase levels between CKD-affected populations and non-CKD-affected populations while adjusting for potential confounding of current treatment, clinical risk factors, and medical history. Population was organized into two groups in New Orleans: participants diagnosed with CKD (n=163) and the control group, participants not diagnosed with CKD (n=186). Three models were created to measure differences in median chymase levels between the two groups while adjusting for common CKD risk factors and treatments. Medians and interquartile ranges for plasma chymase were calculated for both groups, and Mann-Whitney U tests determined differences in the unadjusted medians. Quantile regression was used to create the three models and obtain multivariable-adjusted medians for plasma chymase levels in both groups. Wald tests assessed differences in the adjusted medians between the two groups for all three models. After adjustment for all variables tested, median plasma chymase remained significantly higher (p=0.04) in CKD patients (1.7 pg/mL) compared to controls (1.2 pg/mL). This study established an association between elevated chymase levels and CKD that is independent of all factors studied. Results provide the foundation for vital further research to determine if chymase is a viable measure to predict CKD progression and assess effectiveness of chymase inhibitors in improving renal outcomes for CKD patients.

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