Protein-bound uremic toxins and atherosclerotic factor in patients on long-term hemodialysis

針對血液透析患者親蛋白尿毒素與動脈硬化因子之研究

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Background: Advanced glycation end products (AGEs), a pro-inflammatory and pro-oxidative compounds, may play a essential role in endothelial dysfunction and atherosclerosis. Protein-bound uremic toxins including indoxyl sulfate (IS) and p-cresyl sulfate (PCS) will also lead to endothelial dysfunction. Our objective was to explore the association of IS, PCS and AGEs in a hemodialysis-based cohort.

Materials and Methods: This study recruited 129 stable HD patients in a single medical center. Serum levels of total and free IS, PCS and AGEs were measured concurrently. General laboratory results and patient background were also investigated.

Results: The serum levels of AGEs was associated with total IS ($r=0.27$, $p<0.01$) not total PCS ($r=0.01$, NS), free IS ($r=0.11$, NS) and free PCS ($r=0.04$, NS) by Pearson's analysis. Multiple linear regression analysis showed total IS was significantly related to AGEs ($\beta=0.296$, $p<0.01$), free IS ($\beta=0.502$, $p<0.01$) and creatinine ($\beta=0.294$, $p<0.01$). Serum AGEs levels correlated significantly and positively with DM status ($\beta=0.250$, $p=0.01$) and total IS ($\beta=0.341$, $p<0.01$) concentrations by another multivariate model. Moreover, patients with DM had higher serum AGEs levels than those without DM ($p<0.01$).

Conclusion: These findings suggest that the total IS levels were associated with AGEs levels and may participate the process of atherosclerosis.