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Indoxyl sulfate: A new link between chronic kidney disease and coagulation disorders in CKD patients on conservative treatment

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Objectives: Patients with chronic kidney disease (CKD) are at higher risk of incidence of thromboembolic events. The effect of continuous loss of function of nephrons is a progressive accumulation of uremic toxins. Indoxyl sulfate (IS) is an aggressive uremic toxin exerting proinflammatory and prooxidative properties, which affects multiple signaling pathways.

Aim: We examined the association between indoxyl sulfate and activation of the coagulation system in predialysis patients with CKD.

Methods: Studies have been conducted on a group of 53 patients with CKD on conservative treatment and 18 healthy volunteers. For the determination of parameters of coagulation ELISA-immuno-enzymatic kits were used, whereas the IS levels were determined by HPLC. The hematological and biochemical parameters were assessed using standard laboratory methods.

Results: IS concentration was about three-fold higher in CKD patients compared to controls (p<0,0001). Parameters of coagulation: Von Willebrand factor (vWF), thrombomodulin (TM), tissue factor (TF) and its inhibitor-tissue factor pathway inhibitor (TFPI), prothrombin fragment 1+2 (F1+2) in uremic group were significantly higher than in control group (all p<0,0001). IS levels were positively correlated both with CKD markers and all mentioned above coagulation factors, and these results were also statistically significant (all p<0,0001, r≥0,45). Moreover, we found inverse correlation between IS and some hematological parameters (HCT, HGB, WBC, LIM and RBC).

Conclusions: The results demonstrate a strong relationship between indoxyl sulfate and coagulation parameters in CKD patients. It opens a new idea that IS can play a crucial role in the occurrence of thromboembolic events in CKD patients.

Biography

Kaminski T graduated from Medical University of Bialystok, Poland with a Master's degree in Pharmacy; and currently is a PhD student at International Interdisciplinary Doctoral Studies in English at Medical University of Bialystok and Hasselt University. Presently, he is the Principal Investigator of two projects supported by Leading National Research Centre (The Centre for Innovative Research at Medical University of Bialystok) and the project supported by the Polish National Science Centre. All above-mentioned projects focus on searching connections between kidney diseases and hemostatic disorders. Furthermore, he has been granted with the Award of Rector of Medical University of Bialystok for outstanding scientific achievements.

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