Accumulation of kynurenine pathway metabolites in saliva and plasma of uremic patients

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Abstract:
A marked increase in toxic metabolites of the L-tryptophan: kynurenine pathway, kynurenine (KYN) and quinolinic acid has been observed in serum and cerebrospinal fluid of both, rats and humans with renal insufficiency. Recently, we have found increased concentration of KYN and kynurenic acid (KYNA), but not 3-hydroxykynurenine (3-HKYN) and anthranilic acid (AA) in saliva of hypertensive diabetic patients. The aim of the study was to estimate certain kynurenine derivatives in plasma and saliva of uremic patients. The concentration of KYN and its metabolites were estimated in 19 uremic patients and 19 healthy volunteers by high-performance liquid chromatography (HPLC).

The increase in the concentration of KYN, 3-HKYN, KYNA and AA was observed in plasma of uremic patients in comparison with the control group (3.1 ± 1.2 µM, 415.9 ± 120.8 nM, 339.4 ± 189.0 nM and 611.7 ± 274.7 nM vs. 1.6 ± 0.5 µM, 35.6 ± 10.0 nM, 28.0 ± 7.3 nM and 35.1 ± 4.6 nM; p < 0.0001, p < 0.0001, p < 0.0001 and p < 0.0001, respectively). Also in saliva the concentration of KYN (35.1 ± 24.0 nM; p < 0.0001), 3-HKYN (24.5 ± 18.2 nM; p < 0.0001), KYNA (108.6 ± 72.4 nM; p < 0.0001) and AA (111.6 ± 46.4 nM; p < 0.0001) was increased in uremic patients in comparison with the values observed in healthy volunteers (25.8 ± 10.8 nM, 1.1 ± 0.5 nM, 5.7 ± 3.3 nM and 13.7 ± 6.2 nM, respectively).

The increased concentration of KYN, 3-HKYN, KYNA and AA in plasma and saliva of uremic patients in comparison with healthy volunteers suggests an altered metabolism of kynurenine in uremia.

Key words:
kynurenine pathway metabolites, uremia, saliva