THE EFFECT OF N-CHLOROAMINO ACIDS AND HYPOCHLOROUS ACID ON THE ERYTHROCYJTE

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N-chloroamino acids, formed *in vivo* after reaction of the free amino acids with hypochlorous acid, a product of oxidative burst, have been reported to play a key role in chloride transfer between HOCl and biological compounds. Their cytotoxicity is related to their penetration of biological membranes, ability to enter cells and reactivity with molecules.

In this study we compared the effects of HOCl and N-chloroamino acids (Ala-Cl, Lys-Cl, Ser-Cl, Asp-Cl and Phe-Cl) at the concentrations of 125–1000 μM on human erythrocytes. In spite of weak hemolytic potential, monochlorated amino acids induce oxidative stress in the erythrocytes and influence the level of total glutathione content (GSH and GSSG). Increased hemolysis was observed after 10 h incubation of erythrocytes only with 1 mM Ala-Cl and Phe-Cl, while HOCl induced hemolysis after 1 h incubation at a concentration of 125 μM. Osmotic fragility of erythrocytes incresed after 30 min erythrocyte treatment with also 1 mM HOCl, N-chloroalanine and N-chlorophenylalanine. N-chloroalanine, N-chlorolysine and N-chloroserine were the most effective in total glutathione depletion which was time and N-chloroamine concentration-dependent. Incubation of erythrocytes with all investigated chlorocompounds, except for N-chloroaspartic acid at a concentration of 500 μM, led to a shift of red-ox homeostasis of erythrocytes towards a more oxidized state.

Generally, the reactivity of at least some N-chloroamino acids may be not much lower, and in some cases with respect to hypochlorous acid even higher.