

Effect of cholesterol sulphate on the thermosensitivity and fluidity of human erythrocytes

Maria Przybylska, Maria Bryszewska, Richard M. Epand

Cholesterol sulphate (CS) is an ubiquitous compound found in many mammalian body fluids and tissues and a very important constituent of cell membranes. We report here the continuation of our previous studies on the effect of CS on the hypotonic and thermal lysis of human erythrocytes. The present study was undertaken to evaluate further the role of CS in red cell protection against thermally-induced lysis and its influence on membrane fluidity. The results obtained in this study show that in isotonic media the effect of CS on the lysis of erythrocytes depends on a concentration of sterol in the external medium. Low concentrations of this compound, less than $2 \cdot 10^{-5} \text{M}$, protect erythrocytes against lysis (the substantial protective effect has only been observed for a CS concentration of 10^{-5}M), higher induced haemolysis. Studies on membrane fluidity were performed by measuring the emission anisotropy of the fluorescent label TMA-DPH. The effect of CS on membrane fluidity is slightly different for heated than for unheated erythrocytes. For unheated red blood cells CS has a rigidifying effect at almost all concentrations used, whereas for heated erythrocytes high concentrations of CS cause membrane fluidization. This decrease of membrane rigidity corresponds to the increase of haemolysis of heated erythrocytes at high concentrations of CS. For both heated and unheated red blood cells the maximum of anisotropy occurs at the CS concentration which has the maximal protective effect against lysis (10^{-5}).