

Pravastatin Provides Antioxidant Activity and Protection Of Erythrocytes Loaded Primaquine

Fars Alanazi

Abstract :

Loading erythrocytes with Primaquine (PQ) is advantageous. However, PQ produces damage to erythrocytes through free radicals production. Statins have antioxidant action and are involved in protective effect against situation of oxidative stress. Thus the protective effect of pravastatin (PS) against PQ induced oxidative damage to human erythrocytes was investigated in the current studies upon loading to erythrocytes.

The erythrocytes were classified into; control erythrocytes, erythrocytes incubated with either 2 mM of PS or 2 mM of PQ, and erythrocytes incubated with combination of PS plus PQ. After incubation for 30 min, the effect of the drugs on erythrocytes hemolysis as well as some biomarkers of oxidative stress (none protein thiols, protein carbonyl, thiobarbituric acid reactive substance) were investigated.

Our results revealed that PS maintains these biomarkers at values similar to that of control ones. On the other hand, PQ cause significant increases of protein carbonyl by 115% and thiobarbituric acid reactive substance by 225% while non-protein thiols were significantly decreased by 112 % compared with control erythrocytes. PS pre-incubation before PQ exerts marked reduction of these markers in comparison with PQ alone. Moreover, at NaCl concentrations between 0.4% and 0.8%, PQ causes significant increase of Red Blood Cells (RBCs) hemolysis in comparison with the other groups ($P < 0.001$). Scanning electron micrograph indicates spherocytes formation by PQ incubation, but in the other groups the discocyte shape of erythrocytes was preserved.

The reduction of protein oxidation and lipids peroxidation by PS is related to antioxidants effect of this statin. Preservation of erythrocytes fragility and morphology by PS are related to its free radicals scavenging effect. It is concluded that pravastatin has protective effect against erythrocytes dysfunction related any situations associated with increased oxidative stress, especially when loaded with PQ.

Key Word :

Erythrocytes, Drug delivery, Pravastatin, Primaquine, Oxidative Stress

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