

# Turkish Journal of Medical Sciences

Turkish Journal

of

Medical Sciences

Oxidative Damage in Erythrocytes During Cold Storage With Organ Preservation Solution



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**Abstract:** It is known that erythrocyte aggregation in renal tissue during preservation is cause of microcirculation defects in the reperfusion period. The aim of our study is to investigate oxidative damage in erythrocytes relative to the time of cold ischemia during organ preservation and relationship between lipid peroxidation and development of these damages. In experiments with a rabbit model, explanted kidneys were exposed to perfusion and 96 hours preservation with Euro-Collins (EC) in the 1st group, and University of Wisconsin (UW) solution in the 2nd group. Electron-microscopic examinations in renal tissues were performed. Lipid peroxidation and glutathione levels in erythrocytes preserved in the same solutions were investigated. Agglutination of the erythrocytes and adhesion to the endothelium with 24 hours preservation were observed in the kidney tissue of the first group, and after 48 hours preservation in the second group. During preservation of the erythrocytes in organ protection solutions, a marked increase was seen in lipid peroxidation level in the first group with regard to preservation time, while there was less increase in the second group. Consequently, we suggest that membrane damage of red blood cells (RBC) due to increase in lipid peroxidation levels may be the cause of the agglutination and adhesion of the erythrocytes to the endothelium. We believe that these degenerative changes may be a major cause of allograft dysfunction in preservation by simple cold storage.

**Key Words:** Erythrocyte, renal preservation, lipid peroxidation, glutathione, organ preservation solutions

Turk J Med Sci 1999; 29(6): 611-616.

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Other articles published in the same issue: [Turk J Med Sci, vol.29, iss.6.](#)