Spontaneous Leukocyte Cctivation and Oxygen-free Radical Generation : Link between Oxidative Stress and Inflammation in End Stage Renal Failure Patients

윤종우 · Nosratola D Vaziri*

한림대학교 의과대학 신장내과,
*University of California Irvine, Division of Nephrology and Hypertension**

Background : Oxidative stress is common feature and major cause of cardiovascular and other complications of ESRD patients. The evidence of oxidative stress in the patients with ESRD are based on accumulation of stable byproducts of interaction of reactive oxygen species (ROS) with various biomolecules and that represent only indirect evidence. So we evaluate the production of ROS from circulating leukocytes in the uremic patients.

Methods : Eighteen hemodialysis patients and 20 age-matched controls were studied. Pre- and post-dialysis blood samples were obtained and analyzed by 3-color flow cytometry for ROS production, integrin expression and granulocyte granularity. Plasma MDA was analyzed by HPLC.

Results : ESRD patients showed increased leukocyte and decreased lymphocyte count compare to normal control. Superoxide and hydrogen peroxide production were increased in granulocyte and monocyte of ESRD patients compare to that values of normal control. Hydrogen peroxide showed further increase after hemodialysis. Malondialdehyde, byproduct of lipid oxidation marker, was increased in ESRD patients and further increased after hemodialysis. Integrin (CD11a, CD11b, CD18) expression were elevated in granulocyte and monocyte of ESRD patients compare to control and decreased after hemodialysis. Granularity of granulocyte was decreased in ESRD patient and further decreased after hemodialysis. Negative correlations were found between severity of azotemia, ferritin and parathyroid hormone with reactive oxygen species production of granulocyte and monocyte.

Conclusion : ESRD patients showed increased ROS production, accumulation of oxidative stress byproduct and those were further increased after hemodialysis. Also it showed increased various kind of ininflammatory markers. These findings represent association of increased oxidative stress and inflammatory status in ESRD patients.