

Display Settings: Abstract

[Nefrologia](#). 2009 Oct;29(5):464-473. doi: 10.3265/Nefrologia.2009.29.5.5493.en.full.

Study of oxidative stress in advanced kidney disease.

[Article in Spanish, English]

Puchades Montesa M, González Rico M, Solís Salguero M, Torregrosa Maicas I, Tormos Muñoz M, Saez Tormo G, Juan Garcia I, Miguel Carrasco A.

Introduction: Introduction Patients with Chronic renal Disease (CRD) often have cardiovascular disease that is the main cause of morbidity and mortality. Oxidative stress and a subclinical inflammation are crucial factors in its development. The aim of this study was to assess the oxidation of the main molecular lines in patients with advanced renal disease without dialysis and to determine the best biomarker to assess this stress. **Patients and Methods:** We performed an observational study to measure the most important oxidative biomarkers in 32 patients with stage 4 CRD (MDRD = 22.1 +/- 1.08 ml/min) compared with the values obtained in a control group. In peripheral lymphocytes we measured, the lipid peroxidation by Malondialdehyde (MDA) and F2 Isoprostanes in plasma; protein oxidation by glutathione oxidized/reduced ratio (GSSG/GSH) in peripheral lymphocytes and protein carbonyls in plasma and the oxidative damage in genetic material by modified nucleotide base 8-deoxyguanosine oxo-(8-oxo-dG), after isolating nuclear and mitochondrial DNA. We also studied the antioxidant defenses with superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione reductase (GSR) and catalase (CAT) in peripheral lymphocytes. We studied the correlation between oxidative stress and the renal function and oxidative stress and co-morbidity factors. **Results:** All biomarkers showed important differences in comparison with the control subjects. 821.89 +/- 300.47 ng/ml vs. 270 (95.66) * ng/ml ($p < 0.000$), MDA 0.11 (0.11) * vs. 0.7 +/- 0.31 nmol/mg prot ($p < 0.000$). GSSG / GSH: 6.89 +/- 1.91 vs. 1.39 +/- 0.75 ($p < 0.000$), protein carbonyls: 7.41 +/- 0.84 vs. 3.63 (1.12) *. Nuclear 8-oxo-dG 7.88 (2.32) vs. 2.96 (1.78) * mitochondrial 8-oxo-dG: 15.73 +/- 2.28 vs. 13.85 +/- 1.44 ($p < 0.05$). The Antioxidant enzymes also showed differences. Nuclear 8-oxo-dG demonstrated an important relationship with the rest of biomarkers, homocystein ($r = 0.305$, $p < 0.05$), lipoprotein (a) ($r = 0.375$, $p < 0.01$), mitochondrial 8-oxo-dG ($r = 0.411$, $p < 0.05$), GSSG/GSH ($r = 0.595$, $p < 0.001$) and protein carbonyls ($r = 0.489$, $p < 0.05$). There was an inverse correlation with total protein ($r = -0.247$, $p < 0.01$), GSH ($r = -0.648$, $p < 0.000$), GSR ($r = -0.563$, $p < 0.001$) and SOD ($r = -0.497$, $p < 0.000$). We did not find any correlation between these parameters and renal function. The presence of diabetes or the treatment with statins did not show significant differences. * Median (Interquartile range). **Conclusion:** There is an important oxidative stress in patients with advanced renal disease, probably established during early stages of disease. Of the studied parameters, the nuclear 8-oxo-dG is the best marker for oxidative stress in CRD.

PMID: 19820759 [PubMed - as supplied by publisher]

[LinkOut - more resources](#)