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THE IMPACT OF MECHANISMS OF OXIDATIVE STRESS ON THE DEVELPOMENT OF DIABETIC NEPHROPATHY IN TYPE 1 DIABETES

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In a series of 50 type 1 diabetes participants, mean age 18.9±2.8 years, disease duration longer than five years, each with proven incipient diabetic nephropathy, our goal was to determine the potential impact of oxidative stress on the development of diabetic nephropathy. We determined the antioxidant activity of thiol compounds (SH groups), lipid peroxidation by measuring malondialdehyde (MDA), and advanced oxidation protein products (AOPP). Insufficient antioxidant defense was proven in the diabetic nephropathy group, with a dramatic drop in the activity of thiol compounds compared to controls (132.32±36.60 μmol/L vs 189.22±42.90 μmol/l, p <0.001). This may explain the increase in oxidative stress, or increased lipid peroxidation characterized by the production MDA in the diabetic nephropathy group compared to controls (51.28±12.76 μmol/L vs 17.54±6.35 μmol/L, p <0.001), and the increase in AOPP in patients compared to controls (48.82±13.84 vs 18:45±1.73 μmol/l, p <0.001). Correlation analysis showed a correlation between MDA and SH (r=-0.451, p <0.001), and between SH and AOPP (r=-0.487, p <0.001). However, only MDA is a statistically significant risk factor for the development of diabetic nephropathy. Univariate logistic regression analysis showed that MDA is an independent risk factor. An increase in MDA by 1μmol increases the risk of the development of diabetic nephropathy by 32.4%. Reducing SH concentration by 1μmol/L increases the risk of developing diabetic nephropathy by 4%. We conclude that the lower the antioxidant effect of thiol compounds, the more intensive the lipid peroxidation (MDA) will be, thereby increasing the risk for the development of diabetic nephropathy. *Acta Medica Medianae 2017;56(3):94-100.*

Key words: *diabetic nephropathy, oxidative stress, thiol compounds (SH), malondialdehyde (MDA), advanced oxidative protein products (AOPP)*