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Oxidative stress issues and antioxidant treatment in CKD patients

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Without oxygen the existence of the aerobic organism is impossible. However, at the start of the XX century it was discovered, that oxygen may exert toxic effects through the formation of oxygen containing free radicals - reactive oxygen species (ROS). ROS are required for some normal physiological functions - gene expression, cellular growth, defense against infection, biosynthesis of molecules such as thyroxin, prostaglandin, etc. The interaction between ROS and lipids, carbohydrates and proteins may potentially lead to a large number of negative consequences - cross linking of membrane proteins, formation of lipid-protein, lipid-DNA adduct, changes in protein tertiary structure, carcinogenesis and ageing, etc. There are also a large number of substances, which oppose the action of ROS in order the balance between oxidants and antioxidants to be restored. Elevated levels of ROS can be attributed to several factors - exercise, exposure to pollutants, UV light and ionizing radiation and to some pathological states such as uraemia. The kidney is an organ, which is very susceptible to oxidative stress. In advanced CKD patients there is a negative combination between reduced anti-oxidant defense (Vitamin C and selenium deficiency, reduced intracellular levels of vitamin E, reduced activity of the glutathione system) and increased pro-oxidant activity (advanced age, high frequency of diabetes, chronic inflammatory state, uraemic syndrome, bioincompatibility of dialysis membranes and solutions). Restoring the balance in the oxidative status of CKD patients can be accomplished through improved dialysis technique and biocompatible disposables, treatment of CKD related symptoms with pro-oxidant action and supplementation with exogenous anti-oxidants.

Biography

Evgueniy Stefanov Vazelov has acquired his PhD degree in 1999 fromj Sofia Medical University (SMU). He currently is Vice-President of the Bulgarian Society of Nephrology (BSN) and President of the National Association of Dialysis Specialists in Bulgaria (NADSB). He had served one term as Vice-Dean of the Medical Faculty of SMU. He is also head of Dialysis Clinic of University hospital "Aleksandrovska" in Sofia. He has published more than 90 articles in peer-reviewed medical journals. He is a member of the Editorial Board of several national and international journals.

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