Clin Chem Lab Med 2017; 55, Special Suppl, pp S1 – S1121, June 2017 • Copyright © by Walter de Gruyter • Berlin • Boston

Inflammation, Vascular biology, Endothelium, Oxidative stress

Cod: T266

PLASMATIC SOLUBLE RECEPTOR FOR ADVANCED GLYCATION END PRODUCTS (SRAGE) AS A NEW OXIDATIVE STRESS BIOMARKER IN PATIENTS WITH PROSTHETIC-JOINT-ASSOCIATED INFECTIONS

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Background: Post-operative prosthetic joint infection (PJI) is the most common cause of failure of total joint arthroplasty, requiring revision surgery, but a gold standard for the diagnosis and the consequent treatment of PIJ is still lacking. In order to optimize the diagnostic process, infection biomarkers with fast response and high sensitivity and specificity for infection are needed. Among the scenario of infections diagnosis, an emerging role has been recently described for oxidative stress (OS) evaluation. Inflammatory response induces an over production of ROS, exacerbating organ and tissue injuries and recent evidences correlated OS to various diseases and to Advanced Glycation End Products (AGEs). AGEs are pro-inflammatory molecules that trigger a state of intracellular OS and inflammation after binding to their cell membrane receptors RAGE. Recent evidences indicated that soluble receptor AGE (sRAGE) could be considered as OS marker in children with end stage renal disease.
The aim of the present study was to evaluate the diagnostic value of plasmatic sRAGE correlated to the level of OS and antioxidant defenses, in post-operative prosthetic joint infection (PJI), in order to explore the possible application of this new biomarker in the early diagnosis of PJI.
Methods: In order to evaluate oxidative stress in PJI, plasmatic sRAGE levels (by ELISA assay), plasma antioxidant total defenses (by Lag-time method), plasmatic ROS and thiobarbituric acid reactive substances (TBARS) levels (by colorimetric assay) were evaluated in 11 PJI patients and in 30 matched controls.
Results: ROS and TBARS were significantly higher ($p<0,001$) while plasma antioxidant total defenses and sRage were significantly lower ($p<0,01$) in patients with PJI compared to controls.
Conclusions: Our result confirm the substantial OS in PJI and show a strong negative correlation between the level of sRAGE and oxidative stress, suggesting that plasmatic sRage can be considered as a potential OS markers. This new approach could represent a useful diagnostic tool for improving prosthesis joint infection diagnosis, where a clear detection of the infection is still lacking, in addition to routine inflammatory parameters.