

8-Hydroxy-2-deoxyguanosine levels and heart failure: A systematic review and meta-analysis of the literature.

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Abstract

BACKGROUND AND AIMS: The generation of reactive oxygen species (ROS) plays an important role in the etiology of several pathological conditions. High levels of 8-hydroxy-2-deoxyguanosine (8-OHdG), a biomarker of oxidative damage of DNA, have been found in patients with heart failure (HF). We performed a meta-analysis of the literature to investigate the association between 8-OHdG levels and HF.

METHODS AND RESULTS: A systematic search was performed in the PubMed, Web of Science, Scopus, EMBASE databases and studies evaluating 8-OHdG levels in HF patients and controls were included. Differences between cases and controls were expressed as standard mean difference (SMD) or mean difference (MD) with pertinent 95% confidence intervals (95%CI). Impact of clinical and demographic features on effect size was assessed by meta-regression. Six studies (446 HF patients and 140 controls) were included in the analysis. We found that HF patients showed higher 8-OHdG levels than controls (SMD:0.89, 95%CI: 0.68, 1.10). The difference was confirmed both in studies in which 8-OHdG levels were assessed in urine (MD:6.28 ng/mg creatinine, 95%CI: 4.01, 8.56) and in blood samples (MD:0.36 ng/ml, 95%CI: 0.04, 0.69). Interestingly, 8-OHdG levels progressively increased for increasing New York Heart Association (NYHA) class. Meta-regression models showed that none of clinical and demographic variables impacted on the difference in 8-OHdG levels among HF patients and controls.

CONCLUSIONS: 8-OHdG levels are higher in HF patients HF than in controls, with a progressive increase for increasing NYHA class. However, larger prospective studies are needed to test 8-OHdG as a biomarker of HF severity and progression.

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KEYWORDS: 8-OHdG; Heart failure; Meta-analysis; Oxidative stress