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8-OHdG Elevation in Hypoxic COVID-19: A Potential Link to Inflammation and Disease Severity

Tigran Harutyunyan[1,2*], Gohar Tadevosyan[4], Anzhela Sargsyan[1,2], Lily Kalashyan[1], Naira Stepanyan[3], Rouben Aroutiounian[1,2], Galina Hovhannisyan[1,2]

[1] Laboratory of General and Molecular Genetics, Yerevan State University, Yerevan, Armenia

[2] Department of Genetics and Cytology, Yerevan State University, Yerevan, Armenia

[3] National Center for Infectious Diseases, Yerevan, Armenia

[4] Laboratory of Cell Technologies, Institute of Molecular Biology, NAS RA, Yerevan, Armenia

ABSTRACT

Background: Oxidative stress is increasingly recognized as a contributor to severe COVID-19, particularly in patients with hypoxemia and systemic inflammation. 8-hydroxy-2′-deoxyguanosine (8-OHdG) is a sensitive biomarker of oxidative DNA damage. However, its relevance to COVID-19 severity, particularly in relation to oxygen saturation and inflammatory markers, remains underexplored. Aim: This study aimed to evaluate 8-OHdG levels in blood plasma of COVID-19 patients using ELISA. Correlations between 8-OHdG and inflammatory markers C-reactive protein (CRP) and D-dimer were also analyzed. Methods: Plasma 8-OHdG (ng/mL) was measured by ELISA in hospitalized COVID-19 patients stratified into two groups based on peripheral oxygen saturation (SpO_2): hypoxic (SpO_2 <94%, n=33) and normoxic (SpO_2 >94%, n=32). CRP (mg/L) and D-dimer (μg/mL) levels were recorded on admission. Results: 8-OHdG levels were significantly higher in hypoxic patients (1.48 ± 0.10 ng/mL) than in normoxic group (1.20 ± 0.05 ng/mL). CRP (105.16 ± 12.57 mg/L) and D-dimer (9.95 ± 1.11 μg/mL) were also elevated in hypoxic patients compared to normoxic group (65.63 ± 11.40 mg/L and 5.46 ± 1.27 μg/mL, respectively). Spearman's correlation analysis showed strong positive correlations between 8-OHdG and both CRP and D-dimer in normoxic (r = 0.872 and 0.764) and hypoxic (r = 0.850 and 0.901) groups. Conclusions: Increased 8-OHdG levels and its strong correlations with CRP and D-dimer suggest that 8-OHdG may serve as a potential biomarker for identifying patients at greater risk of oxidative injury and poor outcomes. Further research is needed to clarify its prognostic role and integration into clinical risk assessment.

Keywords: COVID-19, 8-OHdG, CRP, D-dimer, DNA damage

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[*]Corresponding Author:

Tigran Harutyunyan, Genomic Instability and Molecular Mutagenesis, Research Institute of Biology, Yerevan State University, 1 Alex Manoogian str., Yerevan, 0025, Armenia.
Email: tigranharutyunyan@ysu.am