Galectin-3 as a possible marker for increased thrombogenicity in COVID-19

M. Puccini, K. Jakobs, J. Friebel, L. Reinshagen, P.A. Schencke, A. Haghikia, U. Landmesser, N. Kraenkel, U. Rauch

Charite - University Medicine, Campus Benjamin Franklin, Berlin, Germany
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Background: Galectin-3 is a β-galactoside-binding lectin that has been described to be overexpressed in inflammation, atherosclerosis, and in myocardial fibrosis. In COVID-19, galectin-3 has been proposed as an important regulator of the inflammatory response and fibrosis processes. The role of galectin-3 as a platelet activator and thrombosis enhancer has been also recently described. However, the role of galectin-3 in the thrombotic risk in COVID-19 hasn't been studied extensively.

Methods: Patients with moderate to severe COVID-19 were included in the study. Hospitalized patients with acute respiratory diseases without COVID-19 were examined as controls. We compared the levels of galectin-3, soluble ST2, tissue factor and tissue factor activity (TFa) as well as several other markers of increased thrombogenicity in both groups. The correlations between galectin-3 and coagulation as well as inflammation markers were assessed. The SOFA score was used as a marker for the clinical outcome.

Results: 93 patients were included into the study of which 56 were SARS-CoV-2 positive (COV+) and 37 were SARS-CoV-2 negative controls (COV–). Galectin-3 levels were higher in the COV+ group (median 7.10 ng/ml [IQR 4.61–9.81] vs. 5.47 ng/ml [3.63–6.66] p=0.016) as well as the TFa (median 334.48 pM [115.19–632.58] vs. 134.02 pM [86.92–206.66]) and the ST2 levels (median 5.49 ng/ml [2.40–9.28] vs. 2.19 ng/ml [0.66–3.91] $p<0.001$). We also observed a positive correlation between galectin-3 and IL-6 (r=0.559, $p<0.001$), ST2 (r=0.332, p=0.005), SOFA score (r=0.441, p=0.003), von Willebrand factor (r=0.401, $p<0.001$), plasminogen (r=0.361, p=0.001), antithrombin (r=0.453, $p<0.001$), and D-dimer (r=0.377, p=0.001).

Conclusion: In patients with acute respiratory diseases, especially with COVID-19, galectin-3 is a marker for increased hypercoagulability and worse clinical outcome. Galactin-3 might be a useful therapeutic target for patients with COVID-19.