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Hidden hemolysis in erysipelas

Elena G Fokina
Central Research Institute of Epidemiology, Russia

Purpose: To study the hemostatic system changes in the dynamics of infection in patients with erysipelas to clarify the pathogenesis of hidden hemolysis and correction of drug therapy.

Methods: The degree of dysfibrinogenemia (fibrinogen and D-dimer level), the functional activity of the platelets (aggregation with ADP) and the erythrocytes (aggregation with lanthanoid ($LaCl_3$) and protamine sulfate (PS)) were studied in 60 patients with erysipelas. Also, we have studied endothelial dysfunction manifested in the decrease of a thrombogenicity of vascular wall endothelium (antithrombin III and protein C) and in the increase of adhesive properties of the endothelium (von Willebrand factor (vWf). The comparison groups comprised patients with focus of inflammation localized on the face (n=24) and the legs (n=36) at various stages of the disease (day 1-3; 4-6; 7-10 and 11-15 from the onset of the disease), undergoing in hospital treatment in Moscow 2nd Clinical Hospital for the Infectious Diseases.

Results & Discussion: The thesis, according to which the rate of hemorrhagic complications in leg erysipelas is by 3.9 times higher than in facial erysipelas was confirmed by laboratory findings. A significant decrease of protein C was noted in patients with leg erysipelas and concomitant chronic venous insufficiency. We have found increased D-dimer and decreased α2-macroglobulin levels. The signs of intravascular (latent) hemolysis (the decrease of haptoglobin concentration and the increase of indirect bilirubin and LDH blood level) with the increase of erythrocytes deformability (aggregation with $LaCl_3$ by 37%) and the decrease of elasticity (aggregation with PS by 2 times) have been identified as one of the main factors for DIC-like syndrome in erysipelas.

Conclusions & Recommendations: The risk of developing severe (hemorrhagic, bullous-hemorrhagic) erysipelas form in lower-limb is higher, than in facial, OR=9.88 [2.81; 34.7]. Signs of intravascular hemolysis are the indication for drugs that improve the rheological properties of blood.

e-fokina@yandex.ru

Precision medicine will fundamentally change the delivery healthcare

Jeffrey Golden
Brigham and Women's Hospital, USA

Countless scientific and healthcare institutions across the United States are producing and using vast amounts of medical data to better understand patients and personalize their care. Current efforts to mine these huge, rich data sets to extract greater insights into complex human diseases like cancer, heart disease, diabetes, neurodegenerative disorders and many more are in their infancy. To achieve our vision we have begun accelerating the use of big data to generate predictive models of disease that will give clinicians new powerful tools to anticipate, prevent and cure disease far more effectively than we are capable of doing today. We are leveraging large collections of digital information from genetic testing, anatomic and clinical pathology data, imaging results, patient phenotyping and other data collected on our patients to precisely diagnose and treat diseases. The basic tenets of our approach are to: (1) Integrate multiple sources of raw data, (2) Generate algorithms and mathematical models to test hypotheses and statistically validate the data at molecular, individual and population levels with the goal to provide tools for diagnostic inferences and predictions, and (3) Presentation of clinically actionable knowledge to the end user. We believe this approach is not only tractable, but scalable, permitting use by institutions and healthcare providers around the world.

jagolden@partners.org