Abstract

Introduction: Thrombotic events are among the most serious complications of sepsis and also the most frequent causes of morbidity and mortality in patients with sepsis. Currently, the administration of low molecular weight heparins (LMWH) is recommended in patients with severe sepsis for prophylaxis of these complications. However, this prophylaxis often fails.

Objectives of the study: One of the objectives of our study was to examine changes in haemostasis in relation to the inflammatory response during 15 days of severe sepsis. The next objective was to determine whether a prophylactic inhibition of F Xa in the range from 0.2 to 0.4 IU/mL is achieved in these patients, if they receive the recommended prophylaxis with LMWH. We also recorded the dynamics of changes in the F Xa inhibition during the entire study period. Moreover, we tried to identify the factors that may affect the antithrombotic efficacy of the subcutaneously administered enoxaparin.

Patient population and methods: A total of 35 ICU patients meeting the criteria of severe sepsis were enrolled in the study. Only 16 of these patients could be followed throughout the entire 15-day period. Patients were treated according to the current guidelines, including LMWH prophylaxis; enoxaparin (40 mg sc per day) was used in this study. Monitoring and venous blood sampling was performed on days 1, 2, 3, 6, 9, 12 and 15 of hospitalization at the ICU. The samples collected were used for laboratory tests of blood coagulation markers (including examination of the F Xa inhibition) and inflammatory reactions.

Results: Peak inflammatory and pro-coagulation response was recorded during the first 3 days of monitoring, thereafter the values of the laboratory markers began decreasing, but they are still significantly higher than normal laboratory values. Subcutaneous administration of enoxaparin led to the achievement of the desired prophylactic range in 20 % of the tests performed. The effect of enoxaparin positively correlated in particular with the level of activity of blood coagulation inhibitors, protein C (PC), and antithrombin (AT).

Conclusion: Severe sepsis is associated with an extreme, prothrombotic condition induced by inflammation. However, the currently recommended prophylaxis of TED fails to achieve adequate inhibition of F Xa in some patients. In critically ill patients with sepsis, it would be beneficial to monitor the prophylaxis with LMWH and adjust the dosage according to the results of the F Xa inhibition tests, while also considering the current levels of coagulation inhibitors, AT and PC.

Keywords: Sepsis, Haemostasis, Low Molecular Weight Heparin; Intensive Care Unit, Venous Thromboembolism