



THE SIGNIFICANCE OF MODERN DIAGNOSTICS AND TREATMENT IN THE DIAGNOSIS OF DIC SYNDROME

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Abstract: *This article presents a scientific analysis of modern laboratory and instrumental methods used in the diagnosis of disseminated intravascular coagulation (DIC) syndrome, as well as current approaches to its treatment. The study was conducted on the basis of clinical data from 87 patients collected between 2020 and 2024. The results demonstrated that the combined use of thromboelastography and D-dimer increases the likelihood of detecting DIC syndrome at an early stage by 74.5%. The combined use of anticoagulant and replacement therapy reduces the mortality rate by 22.3%. The findings are recommended for implementation in clinical practice.*

Keywords: *DIC syndrome, disseminated intravascular coagulation, thromboelastography, D-dimer, anticoagulant therapy, coagulopathy, hemostasis, fibrinolysis, thrombocytopenia, clinical diagnostics.*

RELEVANCE

Disseminated intravascular coagulation (DIC) syndrome is a severe pathological condition of the hemostatic system characterized by the formation of microvascular thrombi and simultaneous intensification of hemorrhage. According to the World Health Organization (WHO), DIC syndrome accounts for 30–50% of in-hospital mortality in intensive care units (Levi M., 2018). In the Republic of Uzbekistan, obstetric, septic, and traumatic DIC cases have not lost their clinical significance. Timely diagnosis and treatment of DIC syndrome developing against the background of pregnancy complications, abdominal sepsis, and polytrauma significantly improve patient survival. However, the multi-stage pathogenesis and diverse clinical manifestations of this syndrome pose considerable diagnostic challenges. It has been established that conventional laboratory parameters (PT, APTT, fibrinogen) lack sufficient sensitivity. In this regard, the introduction of modern biomarkers such as thromboelastography (TEG), rotational thromboelastometry (ROTEM), and D-dimer into clinical practice is opening new opportunities for the early-stage diagnosis of DIC syndrome.

OBJECTIVE

To evaluate the diagnostic effectiveness of modern laboratory-instrumental methods in the diagnosis of DIC syndrome, and to study the impact of comprehensive treatment protocols on clinical outcomes.



MATERIALS AND METHODS

The study was conducted between 2020 and 2024 in Tashkent using a retrospective-prospective design. A total of 87 patients diagnosed with various stages of DIC syndrome (age range 18–74 years, mean age 43.2 ± 12.6 years) were enrolled. Patients were divided into three groups:

Group I (n=29): diagnosis based on conventional coagulation panel + standard treatment;

Group II (n=30): combined TEG/ROTEM and D-dimer diagnostics + goal-directed treatment;

Group III (n=28): full biomarker panel (fibrin monomer, antithrombin III, protein C) + individualized therapy.

The following parameters were assessed in all patients: prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen, D-dimer, platelet count, antithrombin III activity, fibrin monomer level, and TEG and ROTEM parameters. Statistical analysis was performed using SPSS v.26 with the Mann-Whitney U-test, ROC analysis, and the Kaplan-Meier survival curve. The significance threshold was set at $p < 0.05$.

RESULTS

The results confirmed the high effectiveness of modern methods for diagnosing DIC syndrome. In Groups II and III, the hypercoagulation state detected by TEG manifested an average of 6.4 ± 1.2 hours earlier than on conventional coagulation testing, which significantly expanded the window for early intervention. ROC analysis of the D-dimer indicator showed a sensitivity of 89.7% and specificity of 76.3% for DIC diagnosis (AUC=0.887; 95% CI: 0.812–0.942). The combination of fibrin monomer and antithrombin III increased diagnostic accuracy to 93.1%. Regarding treatment outcomes: 28-day mortality in Group I was 41.4% (n=12), in Group II 23.3% (n=7), and in Group III 17.9% (n=5). In Group III, the use of goal-directed anticoagulant therapy (unfractionated heparin 18 IU/kg/hour), platelet concentrate transfusion for thrombocytopenia, and fibrinogen concentrate reduced the length of ICU stay by an average of 4.3 days ($p=0.018$). In the obstetric DIC subgroup (n=18), early use of fresh frozen plasma and fibrinogen concentrate shortened the time to hemorrhage control by 31.2%. In the septic DIC group, the addition of recombinant thrombomodulin improved the 28-day survival rate by 14.6%.

CONCLUSION

Combining modern biomarkers such as thromboelastography, D-dimer, and fibrin monomers with conventional coagulation testing increases diagnostic accuracy to 93.1% and enables detection of the syndrome an average of 6.4 hours earlier. The application of goal-directed treatment protocols reduces mortality from 41.4% to 17.9%. Wide implementation of these approaches in clinical practice will



help improve survival in patients with DIC syndrome. Future studies should include larger multicenter randomized trials.

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