Disseminated Intravascular Coagulation Complicating Allogeneic Hematopoietic Stem Cell Transplantation

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Disseminated intravascular coagulation (DIC) frequently complicates hematologic malignancies and infections [1]. Coagulation abnormalities and thrombocytopenia are common in DIC, and the extent of hemostatic disorders appears to correlate with disease severity. Allogeneic hematopoietic stem cell transplantation (aHSCT) incurs specific, serious, transplant-related complications, including DIC [2], and recovery from these complications is vital for achieving a successful aHSCT outcome. Therefore, taking steps to mitigate coagulation-related complications following aHSCT is very important. Several interactions between coagulation-related blood components and the fibrinolytic systems are involved in the progression of vascular angiopathy.

Recombinant human soluble thrombomodulin (rhTM) is composed of the active extracellular domain of thrombomodulin. Like membrane-bound thrombomodulin, rhTM binds to thrombin to inactivate coagulation. The resulting thrombin-rhTM complex acts to produce activated protein C which inactivates factors VIIIa and Va in the presence of protein S, thereby inhibiting further thrombin formation [3]. Based on the results of a Japanese clinical trial [3], medical insurance cover for rhTM

in Japan was extended to DIC. In addition, there are some reports on the efficacy of rhTM therapies for veno-occlusive disease or thrombotic microangiopathy [4, 5]. However, the effects of rhTM against DIC following aHSCT are poorly understood.

In this issue of *Acta Haematologica*, Inoue et al. [6] have evaluated the efficacy of rhTM in treating DIC complicating aHSCT. They divided DIC patients into 2 groups, treated with or without rhTM. In the rhTM-treated patients, the mean DIC score was significantly improved when compared with non-rhTM patients. Additionally, fibrinogen degradation products, C-reactive protein, inflammatory cytokines, and high-mobility group box 1 were significantly decreased in rhTM-treated patients. Finally, the recovery rate from DIC was significantly higher in rhTM-treated patients. Inoue et al. [6] concluded that rhTM is effective against both DIC and systemic inflammatory complications after aHSCT.

Although aHSCT has made remarkable progress in therapeutic performance, DIC remains an important complication. Vascular endothelial vulnerability and endothelial dysfunction may be involved in the pathogenesis of DIC after aHSCT. Therefore, traditional anticoagu-

lation therapies such as heparin or antithrombin III may not have the expected effect. The current study by Inoue et al. [6] probes further into the therapeutic role of rhTM in DIC after aHSCT. The authors propose that rhTM is effective against both DIC and systemic inflammatory

complications after aHSCT. This new report challenges our previous understanding of therapeutic strategies for DIC after aHSCT. It also suggests that rhTM could allow more efficient treatment for DIC in critical aHSCT patients.

References

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