

Antithrombin (AT) replacement therapy during anticoagulation with heparin

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Management of anticoagulation is a challenging task during ECLS support. In this context, AT replacement therapy has become common place for ECMO in children. More recently, heparin resistance was reported in critically ill patients with COVID-19 complicated or not by venous thrombosis. The goal of AT replacement therapy is to ensure sufficient heparin activity, as antithrombin binds to specific pentasaccharide domains of heparin to accelerate AT-proteinase reactions. However, there is only few data to support effectiveness of such therapy to control the monitoring by heparin activity, aPTT, or ACT, neither clear evidence of clinical benefit. Is there a target antithrombin level? Does AT replacement therapy be deleterious? What is the cost of such therapeutic attitude? What do the recent data tell us? An overview of this natural endogenous inhibitor will be discussed, from the protein structure to plasmatic and cellular interactions, to its expression variability during clinical situation (sepsis, cardiac surgery). Recent trials on its use in pediatric ECMO management and guidelines in venous thromboembolism treatment will be also detailed. Finally, as antithrombin and heparin are highly connected, we will debate on the unclear concept of heparin resistance.

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