Antithrombin III as predictor of liver reserve: A new parameter to improve the results of mechanical circulatory support therapy

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The prevention of end-organ dysfunction is among the most important goals of mechanical circulatory support (MCS) therapy.

Although the relationship between heart and kidney function is well studied, the role of liver function in the setting of cardiac failure is less known.^{1,2} The article by Hoefer and colleagues³ clarifies the role of liver reserve and dysfunction in the setting of extracorporeal membrane oxygenation implantation and the chance to predict it by monitoring antithrombin III activity levels.

Hoefer and colleagues³ demonstrate that acute liver failure (ALF), defined using the King's College Criteria, is related to a high mortality rate in patients undergoing venoarterial extracorporeal membrane oxygenation implantation. The in-hospital mortality rate in this group of patients is reported to be 88.9%. Moreover, use of ALF prediction to better select MCS candidates in the aim to improve survival is an important point in the setting of limited health care system resources.

The same authors³ demonstrate that using a simple laboratory test like antithrombin III is possible to predict with a high level of sensitivity and specificity (81% and 89%, respectively, with a positive predictive value of 72% for an antithrombin III activity cutoff equal to or lower than 59.5%) the development of ALF after MCS.

Finally, liver dysfunction may be responsible of hemorrhage or thromboembolism due to the unpredictable effect of anticoagulation during MCS therapy.⁴ In this view, the chance to predict liver function before MCS implantation could assume a fundamental role to treat more aggressively any coagulation disorders in patients with lower preoperative antithrombin III levels.

A main limitation of the study is that patients undergoing MCS implantation in acute decompensated heart failure may already display different degrees of liver dysfunction that can be related to both reduced arterial perfusion and venous congestion. Consequently, little can be done for

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Central Message

Knowledge of preoperative antithrombin III values is crucial to predicting acute liver failure after mechanical circulatory support implantation.

See Article page 1374.

these patients to reduce the risk of death and ALF. However, routine measurement of antithrombin III values in the setting of chronic heart failure can potentially represent a marker of possible liver dysfunction. This evidence can lead to optimized timing of MCS implantation. Therefore, cardiologists and cardiac surgeons working in the field of heart failure should be strongly sensitized toward routine monitoring of antithrombin III levels.

CONCLUSIONS

This important study introduces what should be considered a very important marker of liver function and reserve in the setting of MCS therapy.

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