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Anti-Factor Xa Monitoring in Overweight and Obese Patients

In a recent literature review of thromboembolic treatment, Rosenbloom and Ginsberg concluded that there is no evidence to support the utility of monitoring anti-factor Xa levels to determine the safety or efficacy of low-molecular-weight heparin (LMWH) therapy.[1] However, they suggested that further studies to determine the value of monitoring anti-Xa levels in obese patients might be appropriate. Indeed, other authors have suggested that periodic monitoring of peak anti-Xa levels in adults with body weight greater than 150 kg might be prudent, to minimize the risk of bleeding complications or thrombosis.[2]

We performed a pilot study to determine if patients of various body weights had the same response to weight-based dosing of LMWH as indicated by measurement of anti-Xa levels.[3] Patients being treated with dalteparin for venous thromboembolism were stratified *a priori* into 3 weight classes: within 20% above ideal body weight, between 20% and 40% above ideal body weight, and more than 40% above ideal body weight. The largest patient weighed 190 kg. No difference between these groups was observed for any of the levels monitored (day 3 and 5 trough levels and day 3 peak levels of anti-Xa). No thromboembolic or bleeding complications occurred in any of the patients during LMWH therapy.

The apparent volume of distribution of LMWHs is confined to the intravascular space, which corresponds to lean body mass. Adipose tissue has relatively low blood volume, and plasma volume does not increase substantially with obesity.[4] Although true weight-based LMWH dosing was safe and effective in our study, it is still unclear whether obese patients should be dosed according to ideal or actual body weight.

Overall, published data are lacking regarding the safety and efficacy of LMWH treatment in obese patients. The results of our small pharmacokinetic study seem to imply that there is no rationale for monitoring anti-Xa levels in this population.

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