Effect of rivaroxaban, in contrast to heparin, is similar in neonatal and adult plasma.

Neonates have lower levels of clotting factors as well as inhibitors. Effects of heparin in neonatal plasma differ from those in adult plasma, and dosage recommendations cannot be extrapolated from adult trials. Rivaroxaban is an oral direct factor Xa inhibitor that can achieve an anticoagulant effect without dependence on anti-thrombin. We performed comparative thrombin generation measurements in neonatal cord and adult plasma with different concentrations of unfractionated heparin and rivaroxaban to evaluate the potential of rivaroxaban in neonatal anticoagulation. The impact of heparin or rivaroxaban on the neonatal and adult hemostatic system was determined measuring calibrated automated thrombin generation and activated partial thromboplastin time in platelet-poor plasma pools of 15 adult samples or 15 neonatal cord samples and addition of seven increasing concentrations of heparin or rivaroxaban, respectively, to the pooled samples. Lag time, time to peak and peak height of thrombin generation in neonatal cord samples were significantly less affected by different heparin concentrations than in adult samples, whereas the impact on reduction of endogenous thrombin potential was higher in neonatal cord samples. The impact of rivaroxaban on thrombin generation parameters showed better comparability between neonatal cord and adult samples. Both anticoagulants showed the same
differences in activated partial thromboplastin time between adult and neonatal plasma at each concentration. Rivaroxaban shows a very similar pattern in neonatal cord and adult plasma in suppressing thrombin generation and prolonging activated partial thromboplastin time values, suggesting that dose finding may be easier with rivaroxaban in neonates.