Category :**Hematology: Other**

A225 - ***Impact of increasing concentration of direct oral anticoagulants and their impact on rotem variables; an experimental study***

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Introduction:

Direct oral anticoagulants (DOAC) have become increasingly common and replaced Warfarin in many instances. Despite DOACs being used in clinical practice for over 10 years there is still no readily available and accredited laboratory test to assess the anticoagulative effect of the different concentrations of different DOACs. Rotational thromboelastometry (ROTEM) is a widespread point-of-care instrument that has the potential to be used for this assessment.
The primary aim was to investigate how the ROTEM variable clotting time (CT) in the EXTEM assay was affected by increasing concentrations of rivaroxaban. Secondary aims were to evaluate the impact of different concentrations of rivaroxaban, dabigatran and apixaban on the ROTEM variables CT, clot formation time (CFT) and α-angle.

Methods:

Blood from twelve healthy volunteers for each DOAC was spiked to anticipated concentrations between 0 and 1000µg/L. These different concentrations were analyzed in four different ROTEM assays (INTEM, EXTEM, FIBTEM and HEPTEM). CT, CFT and α-angle were measured in each assay. Chromogenic anti-IIa and anti-Xa assays were used to determine the actual concentration of the modified samples.

Results:

The concentrations of all three DOACs were proportional to the CT of the four ROTEM assays (Figure 1). Rivaroxaban presented a significant increase in CT-EXTEM for the 200-1000µg/L concentration compared to baseline. CFT and α-angle were affected mostly in supratherapeutic concentrations and primarily in the INTEM assay for all the tested DOACs.

Conclusion:

We demonstrated that CT-EXTEM was affected by the increasing concentrations of rivaroxaban with a linear dose-dependent prolongation. CT in the other ROTEM assays was also affected in a similar manner while the impact on increasing DOAC concentrations on CFT and α-angle were not significant. In clinical practice, CT can be used as a surrogate marker for DOAC concentration.

Image :

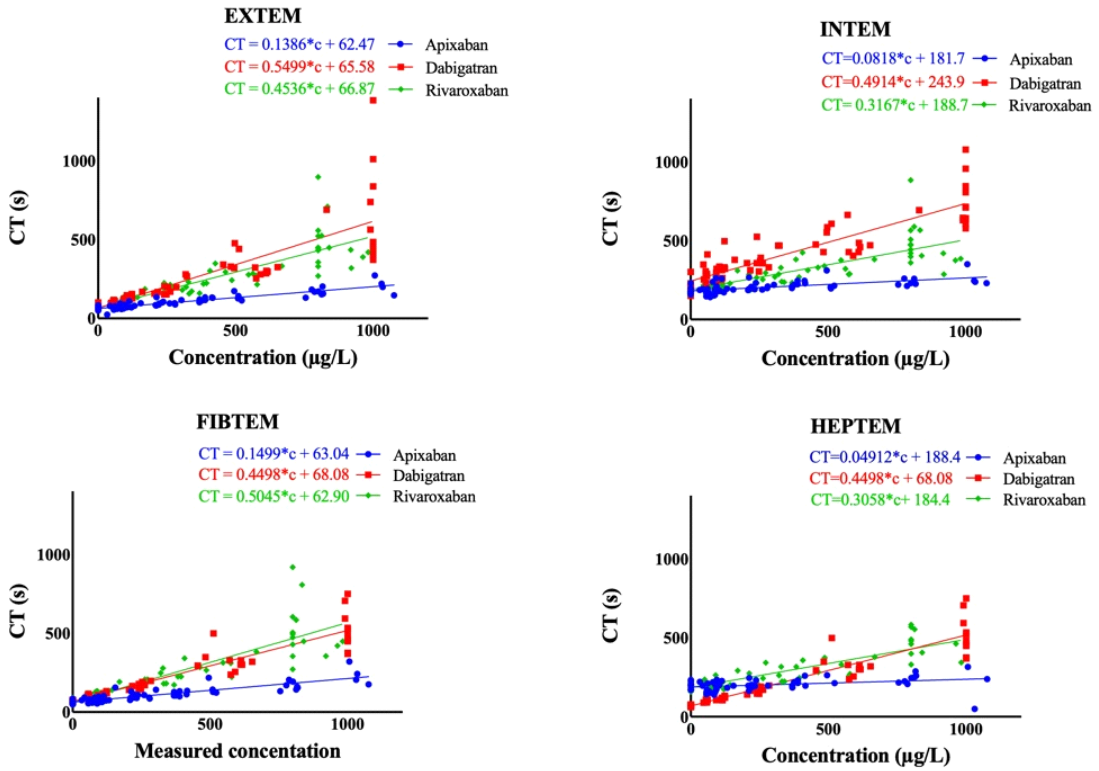

Figure 1 Linear regression of clotting time (CT) value depending on actual concentration of DOAC in EXTEM-, FIBTEM-, INTEM- and HEPTEM-assays. The estimated equations for the different slopes are given. The slopes between all DOACs in all diagrams were different from each other ($p<0.0001$) except for the slopes of rivaroxaban and dabigatran in the EXTEM- and FIBTEM-assays.