ClotPro® DOAC assays

Exclusion of DOAC activity within 5 min

DOACs are increasingly used. Metabolization (dabigatran) and renal function affect DOAC drug half-life and efficacy (fig. 1). Drug interaction, compliance, patient age and specific clinical conditions may alter pharmacodynamics and drug activity.

Routine monitoring of DOACs isn’t required, but in several situations a rapid DOAC detection is desirable, e.g. in major trauma or ischemic stroke to aid therapeutic decisions.

Dedicated assays (anti-Xa and diluted thrombin time) are the reference methods for DOACs, but not available in many centers.

Routine global assays (PT, aPTT) detect DOACs at higher concentrations but are less useful at lower activities (and useless for apixaban).

Stroke patients on DOAC therapy

“In acute ischaemic stroke, the benefit of thrombolysis is highly time-dependent but there are many barriers in obtaining the [plasma DOAC level] result quickly. Infrequent testing means reagents are not readily thawed and ready to go, standards need to be run each time and the laboratory must be well resourced to have trained scientists available.”


Fig. 1: Properties of non-vitamin K-dependent oral anticoagulants

(adapted from Mega JL, Simon T. Lancet. 2015 Jul 18;386(9990):281-91.)

ClotPro® RVV-test and ECA-test show a high sensitivity for DOACs and a good agreement to lab based reference methods.

**RVV-test**

- Detection of direct factor-Xa (FXa) inhibitors
- Ref. No. 113012, 10 x 1 pc
- 30 days stability at room temperature
- 18 months stability at 2 - 8°C

**ECA-test**

- Detection of dabigatran
- Ref. No. 113013, 10 x 1 pc
- 30 days stability at room temperature
- 18 month stability at 2 - 8°C
ClotPro® DOAC assays

Innovative tests for new therapeutics

**RVV-test**

Detection of clotting via FXa – thrombin

Direct activation of FXa by the Russell's viper snake venom (RVV)

Agreement vs. DOAC drug concentration

**RVV-test clotting times**

In a study 100 samples from individuals without anticoagulant therapy had all CTs < 100 s in RVV-test (range: 46-81 s).

**ECA-test**

Detection of clotting via direct activation of prothrombin

Direct activation of prothrombin by the saw-scaled viper venom

Agreement vs. DOAC drug concentration

**ECA-test clotting times**

In a study 90 samples from individuals without anticoagulant therapy had all CTs < 180 s in ECA-test (range: 65-125 s).

- **RVV-test CT is prolonged by**
  - direct FXa antagonists
  - but also by...
    - direct thrombin antagonists
    - LMWH (from about 0.4 anti-Xa U/ml)
    - UFH (high sensitivity)
    - Vitamin K antagonists (2 vitamin K dependent factors)
    - hemodilution / lack of fibrinogen (theoretical)

- **ECA-test CT is prolonged by**
  - direct thrombin antagonists
  - but also by...
    - Vitamin K antagonists (theoretical)
    - hemodilution / lack of fibrinogen (theoretical)
    - not affected by:
      - LMWH / UFH
      - direct FXa antagonists