

A bedside qualitative test to detect effective anticoagulation with direct oral anticoagulants at the Emergency Department - Comparison of visual with photometric test assessment

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Introduction

An accurate test for the rapid detection of effective anticoagulation with a direct oral anticoagulant (DOAC) in emergency situations is an unmet medical need. Recently, a urinary strip test (the DOAC dipstick) was developed, which provides qualitative detection of direct oral thrombin and factor Xa-inhibitors in urine after 10 minutes. The test can be interpreted visually by the naked eye. Newly, a reflectance photometer (DOASENSE Reader) has been introduced, which provides an automatic readout with an objective and user-independent test interpretation.

Aim

To compare visual with photometric assessment of dipstick results in patients on DOAC treatment presenting to an emergency department.

Methods

We analyzed data of a sub-study from a prospective cohort study, which assessed the test accuracy of the DOAC dipstick in a consecutive series of 293 adults (≥ 18 years) on oral thrombin- or factor Xa-inhibitor treatment, who presented to the emergency department of the Medical University of Vienna, Austria. Liquid chromatography-tandem mass spectrometry was used as a reference method to determine DOAC levels in plasma. From 03/2020 to 10/2020, DOAC dipsticks were analyzed photometrically using the DOASENSE Reader in addition to visual assessment. We calculated kappa coefficients together with 95% confidence intervals (95%CI) to determine the strength of agreement between visual and reader assessment of the dipstick results.

Figure 1: Visual assessment of dipstick results

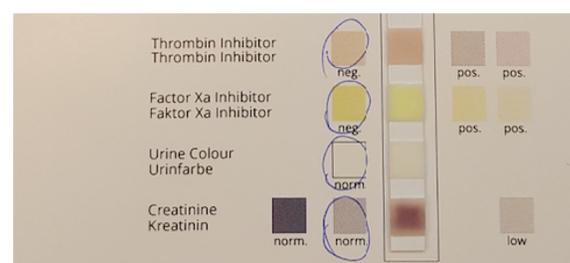
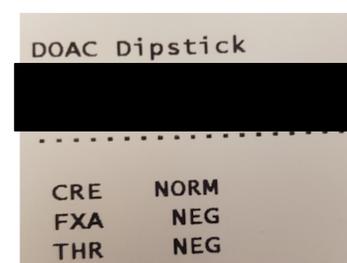


Figure 2: DOASENSE Reader results



Results

In a total of 77 patients (26%) were included in the sub-study and DOAC dipstick results were analyzed by visual assessment and photometrically using the DOASENSE Reader. The agreement between both methods of assessment was high for both the thrombin-inhibitor dabigatran (Kappa 1.000; 95% CI 1.000-1.000) and factor Xa-inhibitors apixaban, edoxaban and rivaroxaban (Kappa 0.9726; 95% CI 0.911-1.000).

Conclusion

In a small cohort of adults on DOAC treatment who presented to an emergency department, photometric assessment of DOAC dipstick results using the DOASENSE Reader was well comparable to visual assessment of DOAC dipstick results.

Conflict of interest: JH is the CEO and founder of DOASENSE GmbH

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