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Detection of Direct Oral Anticoagulants in Patient Urine Samples by Prototype and Commercial Test Strips for DOACs – A Systematic Review and Meta-analysis

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Abstract

The DOAC Dipstick accurately detects the presence or absence of factor Xa (DXI) and thrombin inhibitor (DTI) classes of direct oral anticoagulants (DOACs) in patients' urine samples on DOAC treatment. The aim of the study was to systematically review the literature and compare the performance of prototype and commercial test strips with a meta-analysis.

A systematic literature search of electronic databases PubMed (MEDLINE) and Cochrane Library was performed. Heterogeneity between studies was calculated using the Chi-squared test and the I^2 index. A random effects model was used to pool data to compare the performance of prototype and commercial test strips.

Using PRISMA reporting guidelines, four of 1,081 publications were eligible for inclusion in the meta-analysis: three reporting on prototype (DXI $n = 658$, DTI $n = 586$) and one on commercial test strips (DXI $n = 451$, DTI $n = 429$). Sensitivity and specificity of DXI and DTI detection did not differ significantly between the prototype and commercial test strips. Odds ratios were 0.718 and 0.365 for sensitivity and 1.211 and 1.072 for specificity of DXI and DTI (p-values between 0.3334 and 1.000), respectively. The pooled sensitivity and specificity values for DXI were 0.968 ($p = 0.1290$, I^2 47.1%) and 0.979 ($p = 0.1965$, I^2 35.9%), and for DTI 0.993 ($p = 0.1870$, I^2 37.5%) and 0.993 ($p = 0.7380$, I^2 0%), respectively.

Prototype and commercial DOAC test strips did not differ in their ability to detect DXI and DTI in patient urine samples. This supports the confidence in use of the DOAC Dipstick test, although it needs to be validated in specific patient populations.

Keywords
- meta-analysis
- DOAC Dipstick
- direct oral anticoagulants
- point-of-care test

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