Abstract: P9

Novel use of CHA2DS2VASC score to select patients to undergo repeat atrial fibrillation screening

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Topic(s):
Atrial Fibrillation - Stroke Prevention

Citation:
Background: We have previously demonstrated unselected screening for atrial fibrillation (AF) in patients ≥65 years old in an out-patient setting yielded 1-2% new AF each time screen-negative patients underwent repeated screening at 12 to 18 month interval. Selection criteria to identify high-risk patients for repeated AF screening may be more efficient than repeat screening on all patients.

Aims: This study aimed to validate CHA2DS2VASC score as a predictive model to select target population for repeat AF screening.

Methods: 17,745 consecutive patients underwent 24,363 index AF screening (26.9% patients underwent repeated screening) using a handheld single-lead ECG (AliveCor) from Dec 2014 to Dec 2017 (NCT02409654). Adverse clinical outcomes to be predicted included (i) new AF detection by repeated screening; (ii) new AF clinically diagnosed during follow-up and (ii) ischemic stroke/transient ischemic attack (TIA) during follow-up. Performance evaluation and validation of CHA2DS2VASC score as a prediction model was based on 15,732 subjects, 35,643 person-years of follow-up and 765 outcomes. Internal validation was conducted by method of k-fold cross-validation (k=n=15,732, i.e., Leave-One-Out cross-validation). Performance measures included c-index for discriminatory ability and decision curve analysis for clinical utility. Risk groups were defined as =1, 2-3, or =4 for CHA2DS2VASC scores. Calibration was assessed by comparing proportions of actual observed events.

Results: CHA2DS2VASC scores achieved acceptable discrimination with c-index of 0.762 (95%CI: 0.746-0.777) for derivation and 0.703 for cross-validation. Decision curve analysis showed the use of CHA2DS2VASC to select patients for rescreening was superior to rescreening all or no patients in terms of net benefit across all reasonable threshold probability (Figure 1, left). Predicted and observed probabilities of adverse clinical outcomes progressively increased with increasing CHA2DS2VASC score (Figure 1, right): 0.7% outcome events in low-risk group (CHA2DS2VASC =1, predicted prob. =0.86%), 3.5% intermediate-risk group (CHA2DS2VASC 2-3, predicted prob. 2.62%-4.43%) and 11.3% in high-risk group (CHA2DS2VASC =4, predicted prob. =8.50%). The odds ratio for outcome events were 4.88 (95%CI: 3.43-6.96) for intermediate-versus-low risk group, and 17.37 (95%CI: 12.36-24.42) for high-versus-low risk group.

Conclusion: Repeat AF screening on high-risk population may be more efficient than rescreening all screen-negative individuals. CHA2DS2VASC scores may be used as a selection tool to identify high-risk patients to undergo repeat AF screening.
Abstract: Novel use of CHA2DS2VASC score to select patients to undergo repeat atrial fibrillation screening

Authors: W Sun

Background: We have previously demonstrated unselected screening for atrial fibrillation (AF) in patients ≥65 years old in an outpatient setting yielded 1-2% new AF each time screen-negative patients underwent repeated screening at 12 to 18 month interval. Selection criteria to identify high-risk patients for repeated AF screening may be more efficient than repeat screening on all patients.

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Conclusion: Repeat AF screening on high-risk population may be more efficient than rescreening all screen-negative individuals. CHA2DS2VASC scores may be used as a selection tool to identify high-risk patients to undergo repeat AF screening.

Figure 1. Net benefit of rescreening based on probability predicted by CHA2DS2VASC compared with rescreening none or rescreening all (Left). CHA2DS2VASC scores and corresponding predicted probability (Right).