

Performance of the HAS-BLED high bleeding-risk category, compared to ATRIA and HEMORR2HAGES in patients with atrial fibrillation: a systematic review and meta-analysis

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Abstract

Introduction

Atrial fibrillation (AF) patients' major bleeding risk should be evaluated through risk scores such as HAS-BLED, HEMORR2HAGES or ATRIA. These scores were validated in independent studies with different methods. Therefore, we aimed to review and estimate the value added by ATRIA and HEMORR2HAGES compared to HAS-BLED.

Methods

Medline and Cochrane Library (July 2013) were searched, as well as reviews and references of obtained articles. We looked for studies reporting data for diagnostic accuracy of HAS-BLED with any of HEMORR2HAGES or ATRIA scores, concerning Major Bleeding events. We determined the sensitivity, specificity, and diagnostic odds ratio (DOR) of ATRIA and HEMORR2HAGES compared to HAS-BLED within the same studies. Random effects meta-analysis was performed in order to derive diagnostic accuracy estimates. Heterogeneity was assessed through I² test.

Results

Six studies fulfilled inclusion criteria. Five studies evaluated simultaneously HAS-BLED and HEMORR2HAGES. Sensitivity, specificity, and DOR were respectively 0.53 (0.52–0.54), 0.65 (0.65–0.65) and 2.11 (1.91–2.35) for HAS-BLED, and 0.27 (0.26–0.27), 0.89 (0.89–0.89) and 2.90 (2.77–3.04) for HEMORR2HAGES. Four studies compared HAS-BLED with ATRIA. Sensitivity, specificity, and DOR were respectively 0.41 (0.35–0.48), 0.78 (0.76–0.79) and 2.22 (1.08–4.55) for HAS-BLED, and 0.23 (0.17–0.29), 0.91 (0.90–0.91) and 1.98 (1.29–3.03) for ATRIA.

Conclusions

The 'high-risk' categories of the evaluated major bleeding-risk scores are not sensitive. HAS-BLED, due to its sensitivity (compared to other scores) and ease to apply, is recommended for the assessment of AF patients' major bleeding risk.

Keywords

Bleeding, Hemorrhage, Score system, Clinical prediction rule, HAS-BLED