Mild Elevations of INR Are Not Associated with Significantly Increased Risk in Coumadin-associated Subdural Hematoma
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Introduction
A primary goal in the treatment of patients with coumadin-associated subdural hematoma (SDH) is reversal of coagulopathy with fresh frozen plasma and vitamin K. Achieving the traditional target INR of 1.3 within 24 hours is often difficult and exposes high-risk patients to risks of volume overload and thromboembolic complications. This study evaluates the risk of mild elevations of INR from 1.31-1.69 in patients presenting with coumadin-associated SDH.

Methods
69 patients with coumadin-associated SDH and 197 patients with non-coumadin-associated SDH treated at a single institution from January 2005 through January 2012 were retrospectively identified. Charts were reviewed for age, associated injuries, neurological status at presentation, size and chronicity of SDH, associated midline shift, and for medical comorbidities. Patients were stratified according to use of coumadin and by INR at hospital day 1 (HD1), concomitant aspirin and Plavix use, platelet count, and by INR at HD1 (INR 0.8-1.3, 1.31-1.69, 1.7-1.99, and >2). The groups were evaluated for differences in rate of radiographic expansion of SDH and for differences in rate of SDH expansion resulting in death, unplanned procedure, and/or readmission (considered to be clinically significant expansion).

Results
Key background clinical features of the groups are shown in column 2. There were no differences in size, chronicity, or associated midline shift between the groups (data not shown). There were no differences in rates of radiographic expansion or clinically significant expansion of SDH between patients not on coumadin and those on coumadin (22.3% vs 20.3%, p=0.87; 10.7% vs 11.6%, p=0.83), but the rate of medical complications was significantly higher in the coumadin subgroup (26.1% vs 13.3%, p=0.02). For coumadin-associated SDH, there was no difference between radiographic and significant expansion for patients reversed to a HD1 INR between 0.8-1.3 and 1.31-1.69 (22.5% vs 20%, p=1; 15% vs. 10%, p=0.71).

Conclusions
Mild INR elevations of 1.31-1.69 in coumadin-associated SDH are not associated with a markedly increased risk of radiographic or clinically significant expansion of SDH. This result implies that full reversal of INR to less than 1.3 may be more aggressive than necessary and may expose patients to excess risk.

References
5. Menzin J, White LA, Friedman M, Nichola C, Menzin J, Hoesche J, Bergman G, Jones C. Factors associated with failure to correct the international normalised ratio following fresh frozen plasma administration among patients treated for warfarin-related bleeding. Thrombosis and haemostasis. 662-672, 2012