Hospital length of stay in patients initiated on warfarin versus direct oral anticoagulants in atrial fibrillation and venous thromboembolism

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OBJECTIVE: Direct oral anticoagulants (DOACs) are first line agents associated with lower rates of major bleeding when compared to the vitamin K antagonist (VKA), warfarin, for acute venous thromboembolism (VTE) and non-valvular atrial fibrillation (NVAF). To adhere to national patient safety goals set by The Joint Commission to optimize outcomes with anticoagulant use, accredited institutions must monitor factors associated with adverse drug events (ADEs). One such factor is hospital length of stay (LOS). The objective of this study is to evaluate LOS in patients with a primary diagnosis of acute VTE or new onset NVAF, initiated on DOACs compared to warfarin.

METHODS: A retrospective chart review was conducted to perform a quality improvement analysis in the inpatient setting. The sample size was extrapolated from similar analyses of each individual disease state, in addition to institution-specific length of stay data. These metrics were computed and an initial sample size of 126 patients (in a 5:1, DOAC:warfarin ratio) yielded a power of 80% (α=0.05), to detect a clinically significant two day difference in average LOS. The primary endpoint is hospital LOS from initiation of oral anticoagulation. Mean and median LOS were analyzed using a two-sample t-test and a Mann-Whitney test, respectively. Secondary endpoints include readmission rates within 30 and 90 days, major bleeding events (intracranial bleeding or gastrointestinal bleed), clotting events (stroke, myocardial infarction or recurrent VTE) and time to therapeutic anticoagulation, all analyzed by Fishers-Exact test. A subgroup analysis to evaluate hospital LOS in populations based on individual DOACs, differences in weight, and differences in renal function was planned, but later dismissed due to inadequate samples in each subgroup to assess differences. Lastly, a cost analysis was conducted to compare direct hospitalization costs associated with both warfarin and DOAC hospital LOS.

RESULTS: Of the 316 patients screened for inclusion, 111 patients were initiated on DOACs (apixaban [n=69] and rivaroxaban [n=42]) and 8 patients were initiated on warfarin, for a total of 119 patients. The large ratio difference and small warfarin sample size was accounted for in a post-hoc sample size calculation, in which the sample met power. The mean LOS was 1.62 days (±1.85) and 3.80 days (±2.77) for patients initiated on DOACs and warfarin, respectively (p=0.002). Median LOS was 0.95 days (range, 0.03-10.06) and 4.40 days (range, 0.15-6.95), for patients initiated on DOACs and warfarin, respectively (p=0.028). There was no statistically significant difference in secondary endpoints, however, there was 1 patient with a clotting event requiring admission in the warfarin group. Out of the 8 patients initiated on warfarin, only 4 patients (50%) achieved therapeutic anticoagulation prior to discharge, and 0 patients (0%) reached the secondary outcome of therapeutic anticoagulation with an INR of 2-3 within 2 days, while on warfarin. Internal data revealed that the average direct cost of stay per day for this patient population was $3,129/day (FY20). This revealed an average direct cost of stay savings of $6,917.20 with patients initiated on DOACs in comparison to warfarin, though this analysis lacked reimbursement, insurance and other hospital cost data.

CONCLUSIONS: Initiation of DOACs may be associated with decreased hospital length of stay for patients diagnosed with NVAF and acute VTE compared to warfarin at this institution, which may increase the likelihood of therapeutic anticoagulation at discharge and decreased hospital costs. DOACs should be the first-line oral anticoagulants of choice in eligible candidates based on guideline recommendations.