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RAPID COMMUNICATION

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Risk of inpatient epistaxis admission related to oral anticoagulation medication use

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Abstract

We utilized a case control study to determine if novel oral anticoagulants were associated with a higher risk of inpatient epistaxis admission. Adult patients admitted with a principal diagnosis of epistaxis in 2019–2021 were identified as well as a control group of patients matched 1:1 for age, sex, race, and medical comorbidities. For both cohorts, the presence or absence of an oral anticoagulant, classified as vitamin K inhibitors, direct oral anticoagulants (DOAC) or platelet inhibitors, was identified. 158 adult unique inpatient admissions with a principal diagnosis of epistaxis were identified. Vitamin K inhibition was present in 5.7% of cases versus 0.6% of controls ($p = 0.02$; OR 9.48, range 1.19-75.77), DOACs in 4.4% of cases versus 5.1% of controls ($p = 1.0$) and platelet inhibitors in 2.5% of cases versus 3.8% of controls ($p = 0.75$). We concluded vitamin K inhibitors, compared to DOACs and platelet inhibitors, may be associated with higher likelihood of epistaxis admission.

KEYWORDS
admission, anticoagulation, aspirin, clopidogrel, DOAC, epistaxis, warfarin

1 | INTRODUCTION

Nearly 60% of people will experience a nosebleed at least once in their lives.[1] The risk of epistaxis is increased for patients taking antiplatelet medications and anticoagulants.[2] About a third of Americans over 40 take an antiplatelet medication, usually for cardiovascular indications.[3] In addition, an estimated 8 million Americans take an oral anticoagulant, or clotting factor inhibitor, indicated for mechanical heart valves, atrial fibrillation, or venous or pulmonary thromboses.[4]

The landscape of this latter class of medications has significantly changed with the introduction of direct oral anticoagulants (DOACs), which unlike vitamin K inhibitors, do not require laboratory monitoring and dose adjustments.[5–7] These new drugs can be used for various indications including atrial fibrillation.

Given that only a small proportion of individuals will require inpatient admission for epistaxis over their lifetime,[1] we sought to understand which medications put patients at higher risk for severe epistaxis necessitating this higher level of care. We conducted a case–control study to determine if antiplatelet or anticoagulative medications, particularly DOACs, are associated with a higher risk of inpatient epistaxis admission.

This study was approved by the Mass General Brigham Committee on clinical investigations. Cases consisted of adult patients admitted with a principal diagnosis of epistaxis in 2019–2021. Patients with sinonasal surgery prior to admission were excluded. The control group consisted of adult patients, without an inpatient epistaxis admission,

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TABLE 1 Oral anticoagulation medical use among patients admitted for epistaxis.

	Patients admitted for epistaxis ($N = 158$)	Matched controls	p-Value
Oral anticoagulant use	18 (11.4%)	13 (8.2%)	0.45
Vitamin K inhibitor	9 (5.7%)	1 (0.6%)	0.02
Direct oral anticoagulants	7 (4.4%)	8 (5.1%)	1
Anti-platelet agent	4 (2.5%)	6 (3.8%)	0.75

matched 1:1 to cases based on age, sex, race, and comparative health based on comorbidities during the same time period.

Standard demographic information was extracted. For patients in both the case and control groups, the medical record was queried for the presence of a prescribed oral anticoagulant prior to admission (cases) or within the study period (controls). These anticoagulants were further classified into three sub-categories: vitamin K inhibitors (warfarin), DOACs (dabigatran, rivaroxaban, apixaban, and edoxaban), or platelet inhibitors (clopidogrel). Alternative antiplatelet agents were not prescribed in either cohort. We then compared rates of oral anticoagulant exposure among patients admitted for epistaxis (cases) and controls. Similar comparisons were conducted for each anticoagulant subtype, using a chi-square analysis with significance set at $p < .05$. Odds ratios and 95% confidence intervals were computed.

2 | DISCUSSION

We identified 163 patients admitted with a principal diagnosis of epistaxis in 2019–2021. Five patients could not be matched to controls and were excluded, and the remaining 158 patients (mean age, 65.3 years; 37.3% female) were matched 1:1 to a control group of patients not admitted for epistaxis.

Table 1 shows relative rates of oral anticoagulant medication use between patients admitted for epistaxis and controls. The rate of overall oral anticoagulant medication use did not significantly differ, with 11.4% of patients admitted for epistaxis being prescribed one of these medications, compared to 8.2% of the control group ($p = 0.45$). However, when analyzed by the anticoagulant subgroup, the data demonstrated a significantly increased rate of vitamin K inhibitor use among patients admitted for epistaxis (5.7% vs. 0.6%, $p = 0.02$, odds ratio [OR] 9.48 [1.19–75.77]). The proportion of DOAC utilization (4.4% vs. 5.1%, $p = 1.0$) and antiplatelet medication utilization (2.5% vs. 3.8%, $p = 0.75$) was not different between patients admitted for epistaxis and matched controls.

While antiplatelet and anticoagulant medications increase the general risk of epistaxis,[2] our study suggests that only vitamin K inhibitors increase the risk of severe epistaxis requiring admission. This is consistent with other literature suggesting that DOACs are not associated with severe epistaxis,[8] and that DOACs and antiplatelet agents have lower associated gastrointestinal, intracranial, and overall major bleeding rates than vitamin K inhibitors.[9]

Our results may be explained by the varying efficacy of vitamin K inhibitors, which unlike DOACs, have a narrow therapeutic index, necessitating frequent laboratory monitoring and dose adjustments. In fact, one study found that of patients on warfarin with epistaxis, 75% were over-anticoagulated at the time of presentation.[10] In addition, while the half-life of DOACs is generally 10–12 hours,[11] patients over-anticoagulated on warfarin may take days for their INR to return to therapeutic range, even with vitamin K reversal.[12]

Our results imply that in the acute management of epistaxis, patients on warfarin may require more aggressive measures to prevent admission. Also, patients with recurrent epistaxis on warfarin might be considered for earlier transition to DOAC (if clinically appropriate otherwise). Our study is somewhat limited by sample size, and we do acknowledge the wide 95% confidence interval for the odds ratio of the effect size between vitamin K inhibitors and epistaxis requiring admission (1.19–75.77), which does suggest limited certainty as to the effect size of this medication on this outcome. Inpatient epistaxis admission is a relatively rare event and for this reason, a case–control study design was adopted. Additionally, our definition of severe epistaxis was limited to inpatient admission, and does not quantify epistaxis specifically requiring surgery, embolization, or transfusion. An additional study is underway to examine these relationships.

3 | CONCLUSION

Our study suggests that the risk of severe epistaxis requiring admission is not increased by antiplatelet medications or DOACs, but is increased by vitamin K inhibitors. Otolaryngologists thus may need to manage epistaxis more aggressively in patients taking these latter medications.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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