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Pharmacology in Emergency Medicine

IMPACT OF DISCHARGE ANTICOAGULATION EDUCATION BY EMERGENCY DEPARTMENT PHARMACISTS AT A TERTIARY ACADEMIC MEDICAL CENTER

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Abstract—Background: Although pharmacists commonly provide patient education and help manage high-risk anticoagulant medications in inpatient and outpatient settings, the evidence for these interventions in the emergency department (ED) is less established, especially in the era of direct-acting oral anticoagulants. In 2013, a formal program was initiated whereby patients discharged with a new prescription for any anticoagulant receive education from an ED pharmacist when on-site. In addition, they received follow-up phone calls from an ED pharmacist within 72 hours of discharge. **Objective:** We sought to identify the impact of pharmacist education, defined as the need for intervention on callback, versus physician and nursing-driven discharge measures on patient understanding and appropriate use of anticoagulant medications. **Methods:** A single-center retrospective analysis included patients discharged from the ED between May 2013 and May 2016 with a new anticoagulant prescription. Electronic callback records were reviewed to assess patients' adherence and understanding of discharge instructions as well as for an anticoagulant-related hospital readmission within 90 days. **Results:** One hundred seventy-four patients were evaluated in a per protocol analysis. Patients who did not receive pharmacist education prior to discharge required an increased need for intervention during callback versus those who did (36.4% vs. 12.9%, $p = 0.0005$) related to adherence, inappropriate administration, and continued use of interacting

medications or supplements, among other concerns. In addition, patients who had not received pharmacist counseling were more likely to be readmitted to a hospital or return to the ED within 90 days after their initial visit for an anticoagulation-related problem versus patients who had (12.12% vs. 1.85%, $p = 0.0069$). **Conclusion:** Discharge education by ED pharmacists leads to improved patient understanding and appropriate use of anticoagulants. © 2017 Elsevier Inc. All rights reserved.

Keywords—anticoagulant; discharge education; emergency medicine pharmacy; transitions of care

INTRODUCTION

Significant risks are associated with new prescriptions for anticoagulant medications. In the emergency department (ED), new outpatient anticoagulant therapy is commonly initiated for treatment of new deep vein thrombosis (DVTs) and may be prescribed for low risk pulmonary embolisms (PEs), atrial fibrillation, and other clotting disorders. Outpatient management for most DVTs has been shown to be a cost effective and comparatively safe approach, and is recommended by updated clinical practice guidelines (1–3). Appropriate anticoagulant therapy and continuity of care in these patients may reduce the incidence and frequency of hospital readmissions and adverse drug events (4).

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The impact of anticoagulant education, particularly with warfarin, by pharmacists in the inpatient and outpatient setting has been well described (5–9). The inclusion of pharmacists in the management of anticoagulation in these settings has demonstrated a positive impact in inpatient duration of stay, patient understanding and medication adherence, time to therapeutic international normalized ratio, and cost effectiveness of therapy. However, the role of discharge counseling by pharmacists in the ED is less defined. In addition, few programs in the literature have described the use of direct-acting oral anticoagulants (DOACs) in their protocols.

Davis et al. highlighted the successful implementation of a pharmacist-run ED discharge counseling and follow-up program for patients initiated on warfarin therapy for a new DVT in the ED (10). However, because current anticoagulation guidelines now recommend DOACs as first-line therapy for venous thromboembolism (VTE) management, it is unclear if patients face the same challenges in understanding how to use DOACs as has been seen with traditional low molecular weight heparin (LMWH) bridge to warfarin therapy (1). Despite the advantages of fewer interactions and need for monitoring and dose titration, DOACs have properties that prevent their use in certain patient populations and require patient education regarding appropriate dose regimens, storage, administration, and the occurrence and management of serious adverse events. Falconeri et al. also recently described a transitions of care program established in their ED. In this report, the authors reviewed the outcomes of seven patients discharged under their program with anticoagulation for a new DVT, either on enoxaparin bridge to warfarin or rivaroxaban (11). However, the patient sample size was small and patients with non-DVT indications for anticoagulation were excluded.

To our knowledge, this is the first large evaluation of the potential impact of pharmacist counseling on patient understanding and appropriate use of anticoagulant medications, including LMWHs, warfarin, and DOACs for any indication after discharge from the ED.

MATERIALS AND METHODS

This single-center, retrospective medical record analysis, approved by the institutional review board, evaluated patients discharged from the ED at Northwestern Memorial Hospital (NMH) between May 2013 and May 2016 with a new prescription for an anticoagulant. NMH is a 900-bed, tertiary care, academic medical center located in downtown Chicago, Illinois. The ED is a 55-bed level 1 trauma center with >85,000 patient-visits per year. To address anticipated needs in the high-risk anticoagulation

population, a group of emergency medicine clinical pharmacists and key physician stakeholders developed a pharmacist-led anticoagulation education program, identifying 1) patients who should be included; 2) key interventions, including a 24- to 72-h follow-up call; 3) an electronic system to automatically trigger an ED pharmacist consult; and 4) a way to track the program to monitor patient outcomes. In May 2013, this program was formally instituted, whereby patients discharged from the ED at NMH with a new prescription for an anticoagulant (LMWH, warfarin, or DOAC) received education from the ED pharmacist.

Patients were automatically flagged for pharmacist counseling by the FirstNet (Cerner Corporation, Kansas City, MO) electronic medical record (EMR) upon physician order for an anticoagulant. A standardized electronic form was used by the pharmacist to document bedside counseling activities, which included a review of interacting home and over-the-counter medications, explanation of indication and appropriate medication use, signs and symptoms of bleeding, the importance of adherence and primary care physician follow-up, and the ability to ask any additional questions to an ED pharmacist. Pharmacists also assisted with insurance verification and affordability analysis on physician request. During the time of this evaluation, hours of ED pharmacist coverage were 7 AM to 11 PM Monday through Friday and 7 AM to 3:30 PM Saturday and Sunday. During hours when a pharmacist was not present, patients received anticoagulation education from physicians and nurses at their discretion. Regardless of the counseling intervention provided, all patients discharged on new anticoagulation were flagged in the EMR to receive a follow-up phone call by an ED pharmacist within 24–72 h of discharge to assess adherence and understanding of medication use.

Patients were included in the analysis if there was documentation of an “ED anticoagulant counseling” note in the EMR during this timeframe (Figure 1). The ED pharmacist used this form to document all bedside education and callback interventions and as a guide to evaluate patient adherence and medication use on callback. Patients were excluded from the review if no callback follow-up information could be obtained following three phone call attempts by the pharmacy team. The following patient information was collected from the EMR: patient age, sex, anticoagulant medication prescribed, indication for anticoagulation, documented history of anticoagulation use, noted drug or supplement interactions, appropriateness of medication dosing, if the patient reported having filled the prescription on callback, if they had contacted or seen their primary care provider, if they were taking the medication appropriately, any side effects experienced, and any questions the patient had regarding medication use.

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