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BRIEF REPORTS

Patient Preferences Regarding Pharmacologic Venous Thromboembolism Prophylaxis

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BACKGROUND: The 2012 American College of Chest Physicians venous thromboembolism prevention guidelines emphasized the importance of considering patient preferences when ordering venous thromboembolism prophylaxis.

OBJECTIVE: Determine patient preferences regarding pharmacologic venous thromboembolism prophylaxis.

DESIGN: Single-center, mixed-methods survey.

SETTING: Academic medical center.

PATIENTS: Consecutive hospitalized patients on surgical and medical units.

MEASUREMENTS: Patients were asked about their preferences regarding the route of administration for pharmacologic venous thromboembolism prophylaxis and the rationale for their preference. Qualitative analyses of themes were determined from patient rationale.

RESULTS: Of the 227 patients, a majority (60.4%) preferred an oral medication, if equally effective to subcutaneous options. Dislike of needles (30.0%) and pain from injection (27.7%) were identified as rationales for their preference. Patients favoring subcutaneous administration (27.5%) identified a presumed faster onset of action (40.3%) as the primary reason for their preference. Patients with a preference for subcutaneous injections were less likely to refuse prophylaxis than patients who preferred an oral route of administration (37.5% vs 51.3%, $P < 0.0001$).

LIMITATION: Only medical and surgical patients participated.

CONCLUSION: In a sample of consecutive medical and surgical patients, a majority preferred an oral route of administration for prophylaxis. Patients preferring subcutaneous injections were less likely to refuse doses of ordered pharmacologic prophylaxis. These results indicate use of an oral agent for venous thromboembolism prophylaxis may improve adherence and that integrating patient preferences into care may increase delivery of effective prophylaxis and reduce the incidence of venous thromboembolism. *Journal of Hospital Medicine* 2015;10:108–111. © 2014 Society of Hospital Medicine

The 2012 American College of Chest Physicians (ACCP) guidelines on antithrombotic and thrombolytic therapy conducted a systematic review focusing on patient values and preferences regarding antithrombotic therapy, including thromboprophylaxis.[1] They found that patient values and preferences are highly variable and should be considered when developing future clinical practice guidelines. Notably, there were no studies evaluating patient preferences for venous thromboembolism (VTE) prophylaxis, which is prescribed for the vast majority of hospitalized patients.

Historically, interventions to prevent VTE have focused on increasing prescriptions of prophylaxis. At the Johns Hopkins Hospital, we implemented a mandatory clinical decision support tool in our computerized provider order entry system.[2] Following implementation of this tool, prescription of risk-appropriate VTE prophylaxis dramatically increased for both medical and surgical patients.[3–5] These efforts were made with the implicit and incorrect assumption that prescribed medication doses will always be administered to patients, when in fact patient refusal is a leading cause of nonadministration. Studies of VTE prophylaxis administration have reported that 10% to 12% of doses are not administered to patients.[6] Alarmingly, it has been reported that among medically ill patients, between 10% and 30% of doses are not administered, with patient refusal as the most frequently documented reason.

The purpose of this study was to assess patient preferences regarding pharmacological VTE prophylaxis.

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TABLE 1. Patient Demographics in Relation to Prophylaxis Preference

	Enteral, n = 137	Parenteral, n = 62	No Preference, n = 28
Age, y, mean (± SD)	49.5 (± 14.7)	51.7 (± 16.1)	48.9 (± 14.6)
Male, n (%)	74 (54.0)	38 (61.3)	15 (53.6)
Race n (%)			
Caucasian	81 (59.1)	31 (50.0)	14 (50.0)
African American	50 (36.5)	28 (45.2)	14 (50.0)
Education level, n (%)			
High school or less	46 (33.6)	27 (43.5)	14 (50.0)
College	68 (49.6)	21 (33.9)	9 (32.1)
Advanced degree	10 (7.3)	8 (12.9)	2 (7.1)
Unable to obtain	13 (9.5)	6 (9.7)	3 (10.8)
Past history of VTE, n (%)	12 (8.8)	9 (14.5)	2 (7.1)
Type of unit, n (%)			
Medical	59 (43.1)	24 (38.7)	17 (60.7)
Surgical	78 (56.9)	38 (61.3)	11 (39.3)
Documented refusal of ordered prophylaxis, n (%)	71 (51.8)	20 (32.3)	9 (32.1)
Length of hospital stay prior to inclusion in study, d, median (IQR)	4.0 (3.0–7.0)	3.0 (3.0–5.0)	4.0 (2.0–5.0)

NOTE: **Abbreviations:** IQR, interquartile range; SD, standard deviation; VTE, venous thromboembolism.

METHODS

Study Design

A sample of consecutive hospitalized patients on select medicine and surgical floors previously identified as low- and high-performing units at our institution in regard to administration rates of pharmacologic VTE prophylaxis was assembled from a daily electronic report of patients prescribed pharmacological VTE prophylaxis (Allscripts Sunrise, Chicago, IL) from December 2012 to March 2013. These units were identified in a study conducted at our institution as the lowest- and highest-performing units in regard to incidence of administration of ordered pharmacologic VTE prophylaxis. From this data analysis, we chose the 2 lowest-performing and 2 highest-performing units on the medical and surgical service. To be eligible for this study, patients had to have an active order for 1 of the following VTE prophylaxis regimens: unfractionated heparin 5000 units or 7500 units administered subcutaneously every 8 or 12 hours, enoxaparin 30 mg administered subcutaneously every 12 hours or 40 mg administered subcutaneously every 24 hours. Participants had to be at least 18 years of age and hospitalized for at least 2 days on their respective units. Patients who were non–English speaking, those previously enrolled in this study, or those unable to provide consent were excluded from the study.

Data Collection

Demographic information was collected, including patient-reported education level. To determine their preference for VTE prophylaxis, patients were provided a survey, which included being asked, "Would you prefer a pill or a shot to prevent blood clots, if they both worked equally well." The survey was created by the study team to collect information from patients regarding their baseline knowledge of VTE and preference regarding pharmacologic prophylaxis. Additional data included the patient's education level to determine potential association with preference. The survey was verbally administered by 1 investigator (A.W.) to all patients. Patients were asked to explain their rationale for their stated preference in regard to VTE prophylaxis. Patient rationale was subsequently coded to allow for uniformity among patient responses based on patterns in responses. Our electronic medication record allows us to identify patients who refused their medication through nursing documentation. Patients with documented refusal of ordered pharmacologic VTE prophylaxis were asked about the rationale for their refusal. This study was approved by the Johns Hopkins Medicine Institutional Review Board.

Statistical Analysis

Quantitative data from the surveys were analyzed using Minitab (Minitab Inc., State College, PA). A χ^2 test analysis was performed for categorical data, as appropriate. A P value <0.05 was considered to be statistically significant.

RESULTS

Quantitative Results

We interviewed patients regarding their preferred route of administration of VTE prophylaxis. Overall, 339 patients were screened for this study. Sixty patients were not eligible to participate. Forty-seven were unable to provide consent, and 13 were non–English speaking. Of the 269 remaining eligible patients, 227 (84.4%) consented to participate.

Baseline demographics of the participants are presented in Table 1, categorized on the basis of their

TABLE 2. Patient Preferences and Rationale for Route of Administration for Pharmacological Venous Thromboembolism Prophylaxis

Patients preferring enteral route, n (%)	137 (60.4)
Dislike of needles	41 (30.0)
Pain from injection	38 (27.7)
Ease of use	18 (13.1)
Bruising from injection	9 (6.6)
Other/no rationale	31 (22.6)
Patients preferring injection route, n (%)	62 (27.5)
Faster onset of action	25 (40.3)
Pill burden	11 (17.7)
Ease of use	9 (14.5)
Other/no rationale	17 (27.5)
Patients with no preference, n (%)	28 (12.4)

preferred route of administration for VTE prophylaxis. A majority of patients indicated a preference for an oral formulation of pharmacologic VTE prophylaxis. There was no association between education level or service type on preference. Preference for an oral formulation was largely influenced by patient-reported pain and bruising associated with subcutaneous administration (Table 2). A substantial majority of patients reporting a preference for a subcutaneous formulation and emphasized a belief that this route was associated with a faster onset of action. Among patients who preferred an oral formulation (n = 137), 71 patients (51.8%) were documented as having refused at least 1 dose of ordered VTE prophylaxis. Patients who preferred a subcutaneous route of VTE prophylaxis were less likely to refuse prophylaxis, with only 22 patients (35.5%) having a documented refusal of at least 1 dose ($P < 0.0001$).

DISCUSSION

Using a mixed-methods approach, we report the first survey evaluating patient preferences regarding pharmacologic VTE prophylaxis. We found that a majority of patients preferred an oral route of administration. Nevertheless, a substantial number of patients favored a subcutaneous route of administration believing it to be associated with a faster onset of action. Of interest, patients favoring subcutaneous injections were significantly less likely to refuse doses of ordered VTE prophylaxis. Given that all patients were prescribed a subcutaneous form of VTE prophylaxis, matching patient preference to VTE prophylaxis prescription could potentially increase adherence and reduce patient refusal of ordered prophylaxis. Considering the large number of patients who preferred an oral route of administration, the availability of an oral formulation may potentially result in improved adherence to inpatient VTE prophylaxis.

Our findings have significant implications for healthcare providers, and for patient safety and quality-improvement researchers. VTE prophylaxis is an important patient-safety practice, particularly for medically ill patients, which is believed to be underprescribed.[7] Recent studies have demonstrated that a significant number of doses of VTE prophylaxis are not administered, primarily due to patient refusal.[6] Our data indicate that tailoring the route of prophylaxis administration to patient preference may represent a feasible strategy to improve VTE prophylaxis administration rates. Recently, several target-specific oral anticoagulants (TSOACs) have been approved for a variety of clinical indications, and all have been investigated for VTE prophylaxis.[7–15] However, no agent is currently US Food & Drug Administration (FDA) approved for primary prevention of VTE, although apixaban and rivaroxaban are FDA approved for VTE prevention in joint replacement.[13,14] Although in some instances these TSOACs were noted to demonstrate only equivalent efficacy to standard subcutaneous forms of VTE prophylaxis, our data suggest that perhaps in some patients, use of these agents may result in better outcomes due to improved adherence to therapy due to a preferred oral route of administration. We think this hypothesis warrants further investigation.

Our study also underscores the importance of considering patient preferences when caring for patients as emphasized by the 2012 ACCP guidelines.[1] Our results indicate that consideration of patient preferences may lead to better patient care and better outcomes. Interestingly, there were no differences in preference based on education level or the type of service to which the patient was admitted. Clarification of uninformed opinions regarding the rationale for preference may also lead to more informed decisions by patients.

This study has a number of limitations. We only included patients on the internal medicine and general surgical services. It is possible that patients on other specialty services may have different opinions regarding prophylaxis that were not captured in our sample. Similarly, our sample size was limited, and approximately 15% of potential subjects did not participate. We do believe that our population is reflective of our institution based upon our previously published evaluation of multiple hospital units and the inclusion of low- and high-performing units on both the medical and surgical services. Nevertheless, we believe that much more investigation of patient perspectives on VTE prophylaxis needs to be done to inform decision making, including the impact of patient preferences on VTE-related outcomes. Additionally, we did not evaluate potential predictors of preference including admission diagnosis and duration of hospital length of stay.

In conclusion, we conducted a mixed-methods analysis of patient preferences regarding pharmacologic VTE prophylaxis. Matching patient preference to ordered VTE prophylaxis may increase adherence to ordered prophylaxis. In this era of increasingly

patient-centered healthcare and expanding options for VTE prophylaxis, we believe information on patient preferences will be helpful to tailoring options for prevention and treatment.

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