Can a Short Video Improve Apixaban Knowledge in an Inpatient Setting?

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ABSTRACT
Purpose: To increase patient knowledge about apixaban (Eliquis, Bristol-Myers Squibb) using an educational video delivered in an urban inpatient setting.

Methods: This prospective, quasi-experimental study evaluated knowledge gain and retention in patients receiving apixaban after viewing a short educational video. Knowledge was assessed with a questionnaire immediately before, immediately after, and one month following the educational video.

Results: After 33 patients watched the video, scores increased by 19.7% from the pre-test to the immediate post-test time point (95% confidence interval [CI], 14.5–24.9; \( P < 0.001 \)). Patients previously receiving apixaban or another anticoagulant were less likely to improve scores compared with new patients (\( P < 0.05 \)). Twenty-two of the 33 patients (66.7%) completed the one-month follow-up. No difference in scores from pre-test to one month post-test were noted (6.4%; 95% CI, 1.6–14.5; \( P = 0.11 \)).

Conclusion: The apixaban educational video led to improvements in short-term knowledge; however, patients did not retain this knowledge at one month. Future studies should seek ways to improve long-term knowledge retention.

Keywords: apixaban, anticoagulants, patient education, knowledge retention

INTRODUCTION
The development of direct oral anticoagulants (DOACs) has made anticoagulation more manageable for patients. In contrast to warfarin, these agents have more predictable pharmacological properties, require less frequent monitoring, and are less dependent on factors such as diet and concomitant medications.\(^1\) Because of the reduced complexity of DOACs compared with warfarin, the perceived need for patient education may be diminished.\(^2\)

The Institute for Safe Medication Practices classifies anticoagulation therapy as high risk, as misuse is associated with a significant risk of serious injury or death.\(^3\) Furthermore, the Joint Commission’s National Patient Safety Goal 03.05.01 focuses on reducing the likelihood of patient harm associated with anticoagulation therapy.\(^4\) This goal specifically mentions the importance of comprehensive patient counseling.

Effective patient education is essential in helping patients optimize their medications.\(^5\) In patients taking apixaban (Eliquis, Bristol-Myers Squibb), a lack of understanding regarding appropriate use could lead to an increased risk of thromboembolism or bleeding. Patients taking apixaban should understand the purpose of anticoagulation therapy and how to properly take the medication, including how to handle missed doses and reduce the medication dose after a week of therapy if being treated for acute venous thromboembolism.\(^6\) Patients should also be familiar with adverse effects of the medication, including how to recognize situations that require emergency medical care.

One way of providing education is through the use of educational videos. Previous studies have demonstrated that educational videos have many benefits, including increasing patient knowledge, decreasing health professional time for patient counseling, improving disease control, and increasing patient satisfaction.\(^7–10\) Currently, there is no literature evaluating apixaban video education. The purpose of our study was to validate an apixaban educational video by measuring knowledge before and after the video.

METHODS
Research Design
A quasi-experimental study was conducted at St. John Hospital and Medical Center, a 772-bed community teaching hospital in Detroit, Michigan, from July 2015 to March 2016. Patients were identified via a clinical decision support system (Sentri7, Wolters Kluwer). Patients 18 to 90 years of age who were prescribed apixaban for treatment of deep vein thrombosis (DVT) or pulmonary embolism (PE), reduction of risk of recurrent DVT/PE, and prevention of stroke in nonvalvular atrial fibrillation (AFIB) were included in the study. Patients were excluded if they were diagnosed with Alzheimer’s disease, were pregnant, or were unable to execute study procedures. Only the first patient admission during the study period was included for analysis. Informed consent was obtained from all patients, and the study was approved through the hospital’s institutional review board.

The primary outcome of this study was the change in short-term knowledge as measured by the difference in overall scores between a pre-test and immediate post-test. Secondary outcomes of this study included evaluation of long-term knowledge retention as measured by changes in test scores after one month and evaluating if learning was dependent upon previous treatment with apixaban, previous treatment with any anticoagulant, or level of education. Level of education was evaluated by comparing those with less than high school education, those with high school education, and those with more than high school education.

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Prior to study commencement, two apixaban educational videos (each approximately five minutes in length) were developed by the investigators using Camtasia (Techsmith). Separate videos were created for the treatment and prevention of DVT/PE and prevention of stroke in AFIB due to differences in dosing between indications. Two corresponding questionnaires were created to assess knowledge (Table 1). The videos and questionnaires were written to address six main constructs: purpose of medication, how to take the medication, management of missed doses, identifying adverse events, when to seek emergency attention, and what patients should inform their physicians or pharmacists about while taking apixaban. Videos were purposefully kept short, as previous research has shown that the more information that is presented, the less the patient remembers. An additional construct was added for acute DVT/PE treatment that assessed whether patients understood the difference in dosing during the first week of treatment. Content validation of the questionnaires and videos was performed by three specialists with expertise.
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in anticoagulation therapy, and the videos were pilot tested in five associates with no prior medical training.

The videos are available at the following links: http://tinyurl.com/ApixabanAFIB and http://tinyurl.com/DVT-PJapixaban. Videos during the study period were accessible only through a provided link. Questionnaires had a seventh-grade reading level according to Flesch-Kincaid analysis.

Study Procedure

Patients were approached for potential enrollment during their hospital stay. Once consent was obtained, the pre-test was administered by the study investigators. Patients then watched the apixaban video that corresponded with their prescribed indication (AFIB or DVT/PE). Patients viewed the video on a tablet computer provided by the study investigator. After the video, patients completed a post-test and a satisfaction survey. The satisfaction survey consisted of three questions that asked how much patients learned from the video, how helpful the video was, and if they would recommend watching the video to a family member. Study investigators answered any additional questions related to apixaban and provided education on knowledge deficits present after completion of the immediate post-test. The patient was given a card with a YouTube link for the video and a copy of the video on a DVD so that he or she could access it at home. After one month, patients were contacted via telephone, and the questionnaire was administered again. If patients were not reached after three attempts, they were recorded as “lost to follow-up.” Demographic data collected from patients included age, gender, education level, previous anticoagulants taken, and indication. Deidentified data were obtained from YouTube to evaluate view duration, average percent viewed, and unique views. Unique views allow views to be counted once per device so that multiple views are not counted.

Statistical Analysis

The sample size was calculated using a minimal clinical difference between the pre- and immediate post-test of 17.5% with a standard deviation of 12.5%. These estimates were taken from an unpublished study evaluating a rivaroxaban video at our institution. Using a power of 90% and a two-tailed alpha of 0.05, our goal was a total of 33 patients. Descriptive statistics were used to characterize the study population with respect to demographic and clinical factors, as well as to describe video views. The primary outcome—score improvement on immediate post-test compared with the pre-test—was tested by the paired t-test. The change in correctness on individual questions from the pre-test to immediate post-test was analyzed using McNemar’s test. Score changes at one month were evaluated by paired t-test. Additionally, we evaluated whether the primary outcome differed for patients previously on apixaban, previously on any anticoagulants, or by level of education. This was analyzed using a mixed analysis of variance, and interactions were evaluated. All data were analyzed using SPSS VS 22.0, and a P value of 0.05 or less was used to indicate statistical significance.

<table>
<thead>
<tr>
<th>Table 2 Baseline Characteristics</th>
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<tr>
<td>Variable</td>
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<tr>
<td>Age in years</td>
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<td>Male gender</td>
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<td>Previous oral anticoagulant use</td>
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<tr>
<td>Previous apixaban use</td>
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<td>Indication</td>
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<td>Atrial fibrillation</td>
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<td>DVT/PE</td>
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<td>Education level</td>
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<td>&lt; High school</td>
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<td>High school</td>
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<td>Post-high school</td>
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<td>Internet access</td>
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RESULTS

Seventy patients were screened for entry into the study, and 33 patients were included (24 patients refused consent, and 13 patients were unable to complete study procedures). Reasons for being unable to complete study procedures included poor mental status (n = 5), dementia (n = 3), discharged prior to study completion (n = 2), blindness (n = 2), and medication discontinuation (n = 2). Baseline characteristics are described in Table 2. All 33 patients were analyzed for the primary endpoint. Twenty-two patients (66.8%) completed the one-month follow-up phone call. No significant differences were noted in patients who were lost to follow-up with regard to age (73 ± 11.2 years versus 68 ± 12.4 years; P = 0.26) or previous treatment with apixaban (81.8% versus 63.6%; P = 0.43).

Patient scores increased from pre-test to immediate post-test by 19.7% (95% confidence interval [CI], 14.5–24.9). This improvement was not significantly different for those with an indication of AFIB versus DVT/PE (19.1% versus 22.2%; P = 0.646). Improvement in scores depended on previous apixaban or anticoagulant use (P < 0.05), but not level of education (Figure 1). Patients previously on anticoagulants improved their scores on average from 72.3% to 87.9% (an increase of 15.6 percentage points); those patients who were starting anticoagulant therapy for the first time improved their scores from 57% to 82.9% (a 25.9-percentage-point increase). Patients previously on apixaban improved their scores from an average of 72.0% to 83.3% (an 11.3-percentage-point increase); those patients who were newly started on apixaban improved their scores from 63.8% to 87.1% (a 23.3-percentage-point increase). Individual question responses and changes from pre-test to immediate post-test are listed in Table 3. Patients had significant improvements in understanding the purpose of the medication, identifying adverse effects, knowing how to take the medication, understanding when to seek emergency attention, and management of over-the-counter medications.

Scores from pre-test to one-month post-test were not significantly different (6.4% increase; 95% CI, 1.6–14.5). Four of the 22 patients said they watched the video after discharge and before the one-month follow-up. Seven of the 22 patients had
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Table 3  Number and Percent Correct on Pre-test and Immediate Post-test for Individual Questions

<table>
<thead>
<tr>
<th>Construct</th>
<th>Q1 Pre-test n (%)</th>
<th>Q1 Post-test n (%)</th>
<th>P Value</th>
<th>Q2 Pre-test n (%)</th>
<th>Q2 Post-test n (%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication purpose</td>
<td>26 (78.8)</td>
<td>32 (97)</td>
<td>0.031</td>
<td>30 (90.9)</td>
<td>32 (97)</td>
<td>0.625</td>
</tr>
<tr>
<td>Identify adverse effects</td>
<td>24 (72.7)</td>
<td>30 (90.9)</td>
<td>0.031</td>
<td>11 (33.3)</td>
<td>20 (60.6)</td>
<td>0.016</td>
</tr>
<tr>
<td>How to take the medication</td>
<td>13 (39.4)</td>
<td>24 (72.7)</td>
<td>0.003</td>
<td>32 (97)</td>
<td>32 (97)</td>
<td>1.00</td>
</tr>
<tr>
<td>Missed doses</td>
<td>17 (51.5)</td>
<td>23 (69.7)</td>
<td>0.146</td>
<td>20 (60.6)</td>
<td>26 (78.8)</td>
<td>0.07</td>
</tr>
<tr>
<td>When to seek emergency attention</td>
<td>12 (36.4)</td>
<td>22 (66.7)</td>
<td>0.002</td>
<td>23 (69.7)</td>
<td>27 (81.8)</td>
<td>0.219</td>
</tr>
<tr>
<td>Over-the-counter medications</td>
<td>18 (54.5)</td>
<td>29 (87.9)</td>
<td>0.01</td>
<td>20 (60.6)</td>
<td>24 (72.7)</td>
<td>0.219</td>
</tr>
<tr>
<td>Dosing differences (DVT only)</td>
<td>6 (100)</td>
<td>6 (100)</td>
<td>1.00</td>
<td>4 (66.6)</td>
<td>6 (100)</td>
<td>0.50</td>
</tr>
</tbody>
</table>

DVT = deep vein thrombosis.

been provided with additional apixaban education by a health care provider between the first visit and one-month post-test. This included education from five physicians, one pharmacist, and one nurse.

During the course of the study there were 57 unique video views for the AFIB video. The average video view percentage was 69.5%, and the average duration was 3:22. There were 18 unique views for the DVT video. The average view percentage was 62.4%, and the average duration was 3:08. On the satisfaction survey, 81.9% of patients said they learned quite a bit or a huge amount, and 97% said they found the video helpful or very helpful. Lastly, 97% of patients would recommend that another patient on apixaban watch the video.

DISCUSSION

This is the first study that has evaluated an apixaban educational video in any setting. Our study found an improvement in short-term knowledge for important clinical concepts related to apixaban use; however, this increase in knowledge was not retained at one month. Patients newly started on apixaban had a larger change in knowledge and achieved similar scores after education compared to patients with prior apixaban use. Most patients were satisfied with the video, with almost all patients indicating they would recommend this video to a family member.

Our study agrees with previous studies that have evaluated short-term changes in knowledge in patients receiving anticoagulation therapy. One study with similar methodology evaluating a 12-minute warfarin video saw an improvement in the rate of patients passing a knowledge test after the video (43% versus 90%; *P* < 0.001).12 While the percentage of patients who passed improved, absolute changes in scores were not reported, and there was no follow-up evaluation to measure retention of material. Another study evaluating a five-minute video on venous thromboembolism prophylaxis found improved knowledge scores after watching the video (62% versus 83%; *P* < 0.001).13 No follow-up evaluation of knowledge retention was completed. We could not find any previous studies that have evaluated long-term knowledge retention when evaluating videos as an intervention. However, previous research has shown that information should be repeated to patients for effective learning.14

In our study, we were disappointed that only four patients (18%) said they watched the video after discharge at our one-month follow-up. If a higher proportion of patients had revisited the videos, this may have improved longer-term knowledge.
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retention. Although we had unique YouTube views, this data is not identifiable and may have occurred at any point during the study period, including after we contacted patients for the one-month follow-up. We attempted to increase video viewing by providing a card to patients with the YouTube link and giving patients a DVD with the video. However, this does not seem to be an effective strategy. One meta-analysis found a larger effect size for diabetes education when the intervention involved Internet and text versus text alone.15 Texting a video link could serve as a reminder to the patient to watch the video and would prevent information from being lost upon discharge.

While our study provided a tool for inpatient apixaban education, we believe that these videos would also be excellent outpatient education tools. Following study completion, we have been asked to share our video with several outpatient clinics. Additionally, we opened the videos for public viewing on YouTube. Prior studies of patient education materials available on YouTube have shown variable quality of video content.16 We believe it is important to provide patients with validated, evidenced-based videos that are publically available. Furthermore, the videos we produced are indication-specific, whereas previous anticoagulant videos have provided only an overview for all indications. Proving indication-specific videos is particularly important for apixaban, as different indications have different dosing.17

This study had limitations. First, knowledge changes were not compared to a control group; therefore, we cannot compare our results with traditional counseling from a health care provider. However, video education does not need to be a substitute for provider counseling. In fact, a meta-analysis evaluating multimedia education showed larger effects when the multimedia intervention was used as a supplement to health care provider counseling as opposed to a substitute for provider counseling.18

Second, we were able to contact only 22 of the 33 patients for the one-month knowledge assessment. While these patients were similar in age and prior apixaban use, numerically there were more patients who were new to apixaban. This may have decreased the benefit seen at the one-month follow-up because these patients demonstrated the largest improvement in immediate knowledge gain. Also, our patients may have different levels of education compared to other populations, and therefore, the results may vary at other institutions. However, changes in knowledge scores did not depend on education level, and the video was developed to teach patients at less than a high school level of education. Future studies should investigate whether additional strategies aimed at increasing video views are associated with improved long-term knowledge.

CONCLUSION

The apixaban educational video led to improvements in short-term knowledge. Patients did not retain this knowledge at one month; however, few patients reviewed the video after discharge. Future studies should seek ways to encourage patients to revisit video education or evaluate other strategies to improve long-term knowledge retention.

REFERENCES