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Research Article

Evaluating the Outcomes and Safety of Peribulbar Anesthesia for Patients Taking Direct Oral Anticoagulants

Martha Cordoba[1], Alex Ciaramella[1], Xinling Xu[2], Jeremy Goldfarb[1], Joseph Bayes[1] and Alvaro A Macias[1]*

[1]*Department of Anesthesia, Massachusetts Eye and Ear, Harvard, Medical School, Boston, MA, USA*

[2]*Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA*

***Corresponding Author:** Alvaro A Macias, Department of Anesthesia, Massachusetts Eye and Ear, Harvard, Medical School, Boston, MA, USA.

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Abstract

Study Objective: To assess the rate of complications related to peribulbar blocks in patients taking direct oral anticoagulants (DOAC).

Design: Retrospective study.

Setting: Surgery Center.

Patients: 109 ASA II and III patients taking DOAC within 24 hours prior to the performance of a peribulbar block.

Interventions: Data was collected from the electronic health record looking for complications to the performance of the peribulbar block.

Measurements: Incidence of complications including severe bruising, hemorrhage and blindness was collected.

Main Results: There were N = 109 patients that had and eye block while concurrently anticoagulated on either apixaban, dabigatran or rivaroxaban in this cohort. None of the patients experienced any complication.

Conclusions: Our data support the position, that balancing the risks of stopping and continuing essential anti-thrombotics, that they should not be routinely stopped for patients having an eye block.

Keywords: *Peribulbar Block; Surgery; Anesthesia; Complications; Direct Oral Anticoagulant*

Introduction

Injection of local anesthesia through a needle near the eye, is a technique for providing local anesthesia and akinesia for surgical procedures on the eye [1-3]. These "eyeblocks" are commonly performed with either a peribulbar technique (the needle tip when fully inserted remains outside the conus behind the eye) or a retrobulbar block (the needle tip will be inside the conus behind the eye). Although the risk of complications from these techniques are low, they include excess bruising, and hemorrhage resulting intransient or permanent blindness [4]. The continuation of patient's anticoagulation medications before elective eye surgery is controversial. Several studies have shown that aspirin, warfarin, and clopidogrel [1,2] do not increase sight-threatening complications in these situations, but until recently there was very limited data on the newer direct oral anticoagulants (DOACs). Of concern, is the possibility these agents increase the risk of sight threatening bleeding complications from the eye block or eye surgery. Several studies have shown that aspirin, warfarin, and clopidogrel [5-8]do not increase sight-threatening complications in these situations, but there is very limited data on the newer direct oral anticoagulants (DOACs).

As a result, the American Society of Regional Anesthesia and Pain Medicine (ASRA) recommends that consideration be given to interruption of DOACs prior to performing neuraxial blocks [9].Some anesthesiologists have adopted the same ASRA guidelines for neuraxial techniques when considering performing an eye block. But it important to balance the potential perioperative bleeding risk, with the risk of stopping antithrombotic medications, which can increase the chance of stroke, pulmonary embolism, and myocardial infarction [10,11].

The new medications include Apixaban (Eliquis©), Rivaroxaban (Xarelto©), and Dabigatran (Pradaxa©). All of these medications work to prevent venous thromboembolic events, however they do so by different mechanisms of action. Apixaban and Rivaroxaban both directly and selectively inhibit free and bound factor Xa. Dabigatran is a direct thrombin inhibitor. Currently, Dabigatran is the only anticoagulant of the three to have an FDA approved reversal agent capable or reversing the drug within minutes.

We currently perform approximately 12,600 eye blocks annually at the Massachusetts Eye and Ear (MEE). Our eye block complication rate is 0.04%, this is based on the number of eye blocks reported on our electronic health record system. Our staff is comfortable performing eye blocks on patients therapeutically anticoagulated with warfarin. Our complication rate for this cohort is zero. While there is not enough data supporting the safety of performing eye blocks on patients therapeutically anticoagulated with the newer direct oral anticoagulants (DOACs), most of our providers in our institution extrapolate from the successful precedent set for patients taking warfarin and will proceed with eye block. We perform our blocks with a peribulbar 25g, 7/8-inch needle using an extraconal (peribulbar) technique. We therefore performed a retrospective analysis to determine the safety of performing eye blocks on patients therapeutically anticoagulated with the newer direct oral anticoagulants (DOACs) at our institution.

Materials and Methods

In the cohort we analyzed, all patients who received an eye block were on one of the three anticoagulant medications: Apixaban, Rivaroxaban or Dabigatran. Patients who listed one of these three medications as a home medication at MEE from April, 2016 through April 2017 were identified. This date range corresponds to the implementation of our current electronic medical record at MEE. Of these, patients who reported taking their medication within 24 hours of the eye block were included for analysis. Data was reviewed for patient demographics, eye block procedure events, sedation and time of last anticoagulant administration. Eye block procedure events were defined/identified as the performance of a regional anesthetic block to the eye, to enable surgery. The eye block technique was an injection of MEE standard eye block mix (0.375% bupivacaine, 1% Lidocaine, 5 units/ml hyaluronidase) using a 25g, 7/8-inch peribulbar needle, with the end point of achieving akinesia and sensory anesthesia of the eye.

Results and Statistics

Of the 240 patients initially screened, 109 were found to have taken their anticoagulant medication less than 24 hours before their eye block procedure. The breakdown of administration times is displayed in table 1.

Last Administration of Anticoagulant		
Within 24 Hours	Within 36 Hours	Greater than 36 Hours
109	16	115

Table 1: *Last administration time breakdown.*

From the selected 109 patients having taken their anticoagulant medication within 24 hours of the eye block procedure it was found that three direct oral anticoagulation medications were being used: Apixaban (53.2%), Dabigatran (11.9%), and Rivaroxaban (34.9%). The distribution of subjects taking either of these medications is shown in table 2. The frequencies of the medication used are shown in table 3.

Anticoagulant within 24 Hours n (%)			
Apixaban	Dabigatran	Rivaroxaban	Total
58 (53.2%)	13 (11.9%)	38 (34.9%)	109 (100%)

Table 2: *Specific anticoagulant breakdown.*

Anticoagulant use distribution					
N = 240	Apixaban	Rivaroxaban	Edoxaban	Dabigatran	Any DOACs
Yes	82 (34.31%)	79 (33.05%)	0	26 (10.88%)	187 (78.24%)
No	158 (65.69%)	161 (66.95%)	240 (100.00%)	214 (89.12%)	53 (21.76%)

Table 3: *Frequencies of patients using specific DOAC, and any DOACS.*

The overall incidence of hemorrhage, blindness, bruising, or other adverse events that could be attributed to non-cessation of these medications was found to be 0% (0/109).

There were N = 109 patients that had eye block while concurrently anticoagulated on either apixaban, dabigatran or rivaroxaban in this cohort. Patient characteristics were shown in tables 4. Categorical variables were summarized using frequencies and percentages, and continuous variables were summarized using mean, median and standard deviation.

Patient Characteristics		
N = 109		
	Characteristics	
ASA	2	61 (56.0%)
	3	48 (44.0%)
Gender	Male	56 (51.4%)
	Female	53 (48.6%)
Needle type	Peribulbar	101 (92.7%)
	Retro/Peribulbar	6 (5.5%)
	NR	2 (1.8%)
Laterality	Left	52 (47.7%)
	Right	57 (52.3%)
Aspirin within 24 hours	Yes	25 (22.9%)
	No	84 (77.1%)
Weight (kg)	Mean (sd)	81.96 (21.17)
Age (Years)	Mean (sd)	74.74 (8.69)
Eye block amount (ml)	Median (q1, q3)	6 (5, 6)
Time of DOAC to EyeBlock (hours)	Median (q1, q3)	5.05 (2.87, 7.95)

Table 4: *Patient characteristics of those who had taken anticoagulant medication within 24 hours.*

Discussion

The overall incidence of complications (severe bruising, hemorrhage, blindness) due to continuation of anticoagulant medications during eye block procedures in our study was 0% (0/109). The absence of adverse outcomes in our institutional experience provides support for the safety of continuation of these medications during eye block procedures. This is reassuring for a complex patient population in whom concerns of complications related to interruption of therapy are ever-present and in whom the risks of risks of general anesthesia frequently are higher than the general population.

The use of new direct oral anticoagulants and eye block procedures, are both increasing due to the aging of our population. Recently two large retrospective studies suggested that patients taking DOACs before cataract surgery with needle blocks, had no higher incidence of bleeding complications then the general population. Of note, one of these studies [12] suggested only patients taking two antiplatelet drugs together, (e.g. aspirin and clopidogrel because of a recently implanted cardiac stent), might have a higher risk of retrobulbar hemorrhage then the general population [12,13]. We believe our data support the position, that balancing the risks of stopping and continuing DOACs, that they should not be routinely stopped for patients having an eye block. We also believe if anti-thrombotics and antiplatelet drugs are to be stopped preoperatively, a consensus should be first reached involving the surgeon, anesthesiologist, physician who prescribed the anticoagulant(s), and the patient, weighing the relative risks of bleeding and thrombosis.

More studies are needed on the risk-benefit relationship of eye blocks and anticoagulant cessation to provide concrete evidence on the matter, and to create evidence-based guidelines.

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