·Clinical Research·

Peribulbar anesthesia in 750 patients treated with oral anticoagulants

Emile Calenda[1], Olivier Genevois[2], Annie Cardon[1], Marc Muraine[2]

[1]Department of Anesthesia, Rouen University Hospital, 1 rue de Germont, Rouen cedex 76031, France
[2]Department of Ophthalmology, Rouen University Hospital, 1 rue de Germont, Rouen cedex 76031, France
Correspondence to: Emile Calenda. Department of Anesthesia, Rouen University Hospital, EA 3830, 1 rue de Germont, Rouen cedex 76031, France. emile.calenda@chu-rouen.fr
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Abstract

• AIM: To check the safety of continuation of oral anticoagulants in ophthalmic procedures requiring a peribulbar anesthesia.

• METHODS: A prospective case control study included 750 patients with oral anticoagulants in group A and 750 patients who had never been treated with oral anticoagulant in group B. Hemorrhages were graded as follows: 1) spot ecchymosis of eyelid and or subconjunctival hemorrhage; 2) eyelid ecchymosis involving half of the lid surface area; 3) eyelid ecchymosis all around the eye, no increase in intraocular pressure; 4) retrobulbar hemorrhage with increased intraocular pressure.

• RESULTS: In group A, grade 1 was observed in 13 patients (1.74%) and grade 2 in 2 patients (0.26%). In group B, grade 1 was observed in 12 patients (1.6%) and grade 2 was absent. No 3 or 4 hemorrhage grade was encountered in both groups. There was not significant difference in grade 1 hemorrhage between both groups (P=0.21).

• CONCLUSION: Oral anticoagulants were not associated with a significant increase in potentially sight-threatening local anesthetic complications.

• **KEYWORDS:** oral anticoagulants; eye procedure; hemorrhage; peribulbar block
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INTRODUCTION

This prospective case control study enrolled 750 patients treated with oral anticoagulants and a control group of 750 patients to check the safety of continuation of oral anticoagulants in ophthalmic procedures requiring a peribulbar anesthesia.

Anticoagulants are frequently used in curative or preventive treatment from thromboembolic accidents (arterial or venous), with the main complication being hemorrhage [1]. Therefore, before a surgical act in ophthalmic surgery, the correct attitude to carry out is whether transitory interruption with or without alternation with heparin therapy, or maintenance of the treatment without reduction of the dose. The choice between these different strategies depends on the hemorrhagic risk and the thromboembolic risk that should be evaluated in each patient in order to obtain the best benefice/risk ratio. Recent studies proved the possibility to practice acts in ophthalmic surgery without interruption or diminution of the dose of oral anticoagulants[2-5].

There is no case of after effects or of death due to postoperative hemorrhage reported in the literature in patients in which an ophthalmic surgery has been performed without modification of the oral anticoagulant treatment. However, deadly sequels were noted in cases where the oral anticoagulant treatment has been interrupted or diminished[6-8]. Phacoemulsification of the lens with topical anesthesia is nowadays performed in patient treated with oral anticoagulants. For posterior segment surgery continuation or discontinuation of oral anticoagulants is always a concern. Ophthalmic surgeons should pay close attention to the indications for oral anticoagulant therapy in their patients and should enlist appropriate collaboration with their colleagues in cardiology to minimize risks to their patients [9]. Pre and intra-operative risk factors for thrombosis have to be balanced against the risk factors for surgical bleeding. The perioperative management must be an interdisciplinary decision resulting from a collaboration between cardiologists, surgeons and anesthesiologists[10].

The goal of prospective study is to confirm an attitude for management of patients under oral anticoagulants treatment, having to go through an ophthalmic surgery with a peribulbar block. So we undertook a prospective case control study to ascertain the relationship between the continuation of oral anticoagulants and bleeding associated with a peribulbar block.

SUBJECTS AND METHODS

Approval of our hospital ethics committee was obtained for that prospective case control study. Patients who received elective ophthalmic surgery under peribulbar block from January 2005 to July 2012 were recruited. Patients were allocated to two groups on the basis of their oral anticoagulant therapy. Consent to the oral explanation for the risk of hemorrhage was obtained. International Normalized Ratio (INR) was assessed in a range of 2 to 6h before surgery. Patients taking an additional antiaggregant therapy were excluded together with patients having an INR over 4.5. Patients were evenly distributed in each group over a seven-year period.

The group B was represented by 750 patients who never received oral anticoagulant and scheduled for the same surgery and the same anesthesia procedure. Patients with preexisting factors such as congenital coagulopathy, deficit in blood factors of coagulation, severe renal dysfunction, unstable high blood pressure with treatment, were likewise excluded in both groups.

All patients received orally hydroxyzine (UCB Pharma SA) (0.5 to 1mg/kg), or alprazolam (Pharmacia-Upjohn) (0.01mg/kg) 1h before surgery. A short-acting drug (midazolam) 0.5 or 1mg was intravenously administered 5min before peribulbar anesthesia in patients who seemed very anxious.

Two anesthesiologists were present in the surgery room. The anesthesiologist who performed the peribulbar block was blinded for the continuation of oral anticoagulants during the anesthesia procedure. The nurse anesthetist was in charge of the collection of data. The surgeon was blinded for the continuation of oral anticoagulants and assessed bleeding according to the defined protocol. Bleeding was assessed by the ophthalmologist during the surgical procedure, for 24h after the peribulbar anesthesia, one week and one month later. The information of medication was given to the surgeon at the end of the surgical procedure. Hemorrhages were graded in each group as follows: 1) spot ecchymosis of eyelid and or subconjunctival hemorrhage; 2) eyelid ecchymosis involving half of the lid surface area; 3) eyelid ecchymosis all around the eye, no increase in intraocular pressure; 4) retrobulbar hemorrhage with increased intraocular pressure.

Peribulbar blocks were performed by 3 anesthesiologists experienced in that technique according to the Hamilton's technique, and as described in our previous studies [11-13]. The first percutaneous insertion of the needle (25 Gauge, 32mm long) was parallel to the orbital floor at the lateral aspect of the inferior orbital rim (maximal depth 25mm), and the second (maximal depth 25mm) at level of supraorbital notch. The injection was immediately stopped when the globe seems tense. As soon as the globe became soft, the second injection was started until another sensation of tension of the globe. A Tono-Pen XL (Reichert Technologies, USA), which provides intraocular pressure (IOP) readings that correlate closely with Goldmann Tonometry, is commonly used in case of suspected high IOP. We used a mixed anesthetic solution of equal quantity of lidocaine 2% (20mg/mL) and bupivacaine 0.50% (5mg/mL). We did not apply a pressure by an ocular cuff, after the peribulbar block. We have never administered more than 10mL of lidocaine 2% and 10mL of bupivacaine 0.50%.

A fisher exact test was chosen to compare both groups and $P<0.05$ was considered as significant.

Table 1 Demographic variables n=750

Parameters	Group A	Group B	P
Age (a) mean and range	76, 52-94	71, 45-86	
Weigh (kg) mean and range	75, 50-160	72, 54-96	
Oral anticoagulants	Yes		
INR 1-2	144		
INR 2-3	453		
INR 3-4	147	No	
INR>4	6		
INR>4.5	excluded		
Hemorrhage	15/750 (2%)	12/750 (1.75%)	
Grade 1	13 (1.74%)	12 (1.6%)	0.21 (NS)
Grade 2	2 (0.26%)	0	0.48 (NS)
Grade 3	0	0	
Grade 4	0	0	
Operations			
Cataract	345, 46%	350, 46.6%	0.35
Vitrectomy	333, 44.4%	328, 43.7%	0.37
Buckling and/or circling	52, 6.9%	48, 6.4%	0.27
Keratoplasty	12, 1.6%	11, 1.46%	0.55
Amniotic membrane	8, 1.06%	13, 1.73%	0.45

RESULTS

Consecutive 750 patients who continued to receive oral anticoagulants (fluindione 86% of patients, acenocoumarol 9.6% and warfarin 4.4%) were allocated to group A. The distribution of the INR was displayed in Table 1.

The overall incidence of hemorrhage in our study was 2% (15/750) in the group of patients treated with oral anticoagulants and 1.73% (12/750) in the group of patients not treated with oral anticoagulants. Grade 1 hemorrhage was observed in 13 patients (1.74%) in the group A and in 12 patients (1.6%) in the group B. The 13 patients were divided according to their INR as follow: INR 1-2:6 patients, INR 2-3:7 patients. Considering grade 1 hemorrhage both groups were equivalent(P=0.21). Grade 2 hemorrhage was observed in 2 patients (0.26%) (INR 3.12 for one and 2.72 for the other) in the group A, and absent in the group B. Grade 3 or 4 hemorrhage was not encountered in both groups (Table 1). The volume of local anesthetic was of 12 ±3mL (mean ± standard deviation) in the group A and 11 ±2.5mL in the group B. Because the P value of ANOVA test was 0.07 (risk chosen alpha=0.05), we can accept the hypothesis stipulating

that the mean of volumes injected by each anesthesiologist is equal, consequently no differences were found among the 3 anesthesiologists.

No patient expressed cardiac and/or neurologic mild or severe complications nor any other general side effect. The physical characteristics and ophthalmic procedures of both groups were collected in Table 1.

DISCUSSION

The overall incidence of hemorrhage in our study was 2% (15/750) in the group of patients treated with oral anticoagulants and 1.73% (12/750) in the group of patients not treated with oral anticoagulants.

The absence of ophthalmic side effects consecutive to grade 2 hemorrhage encountered in group A and the absence of grade 3 and 4 leads to the acceptance of that risk. That prospective, comparative study included an important cohort of patients and lead to the conclusion that oral anticoagulants are not associated with a significant increase in potentially sight-threatening local anesthetic complications.

Prospective studies with a large number of patients: We have not found prospective studies describing complications after peribulbar blocks in patients treated with oral anticoagulants, so we have chosen to carry out a prospective case control, monocentric study with a control group on a long period of time (2005-2012). This is the first prospective study, with case control, with a great number of patients (750 in each group).

Retrospective studies with few patients: Malik *et al*[14] reported , in a retrospective study, 18 patients treated with warfarin undergoing transconjunctival sutureless vitrectomy. A subconjunctival anesthesia only was used for these patients. They concluded that transconjunctival sutureless vitrectomy using subconjunctival anesthesia may be a safe and effective surgical option in select patients.

Brown *et al*[15], conducted a retrospective comparative cohort study of patients undergoing a diabetic pars plana vitrectomy by a single surgeon over a 30-month period at a single institution. Only 27 eyes remained on anticoagulation during the surgery. There were no perioperative complications related to the anticoagulation. They found no difference in the incidence of postoperative vitreous hemorrhage between both groups. They have estimated that patients undergoing diabetic vitrectomy, who are on anticoagulation, did not exhibit a higher risk of intraoperative or postoperative vitreous hemorrhage and anticoagulant therapy may be safely continued perioperatively to avoid complications secondary to their systemic disease[15].

Mason *et al* [16] reported in a retrospective study no incidents of retrobulbar or orbital hemorrhage in the 64 retrobulbar or peribulbar blocks performed in the warfarin group.

Passemard *et al* [17], conducted a retrospective case series study of only 12 eyes with anticoagulants, in one academic center. The incidence of overall and mild postoperative hemorrhagic complications was similar between groups. Their conclusion was that peribulbar anesthesia for vitreoretinal surgery can probably be performed safely in patients receiving anticoagulants.

Jaeryung *et al*[18], in another retrospective study of 21 patients who had taken anticoagulants, the INR was available in 11 patients only (median 1.25, range: 0.80-3.15). Postoperative intraocular hemorrhage occurred in 2 patients and their INRs were 1.21 and 3.15. Their conclusion was that no meaningful statistical analyses could be derived because the number of patients was very few.

Kallio *et al*[19], observed in 76 patients taking warfarin, 3.9% of hemorrhage and concluded that the continuation of warfarin do not predispose to hemorrhage when a retrobulbar/peribulbar block had been performed.

Retrospective studies with a large number of patients: Benzimra *et al* [20] in a multicentric audit analyzed 48 862 files, coming from the UK Cataract National Dataset, between 2001 and 2006. They retrospectively collected 2 491 patients treated with warfarin. The incidence of subconjunctival hemorrhage was increased in patients taking warfarin (3.7%). No retrobulbar hemorrhage was noticed. They concluded that warfarin is associated with increase in minor complications of sharp needle. Their retrospective study reported the largest number of patients ever treated with oral anticoagulants.

Oral anticoagulants were not associated with a significant increase in potentially sight-threatening local anesthetic complications. Oral anticoagulants can be safely continued.

Based on our findings, the discontinuation of oral anticoagulants in ophthalmic procedures requiring a peribulbar anaesthesia is not associated with better haemostasis. Therefore, the authors feel that discontinuation of oral anticoagulants in such patients is no longer justified in these patients. The authors postulate that avoiding interference with the anticoagulant regimen during perioperative period may reduce the risk of several cardiovascular co-morbidities including acute heart syndrome and pulmonary embolism.

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