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ScienceDirect
British Journal of Oral and Maxillofacial Surgery 50 (2012) 65–68
BRITISH Journal of Oral and Maxillofacial Surgery
www.bjoms.com

Safety of local anaesthesia in dental patients taking oral anticoagulants: is it still controversial?

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Accepted 1 November 2010
Available online 4 December 2010

Abstract

The aim of this study was to investigate the safety of local infiltration techniques and the inferior alveolar nerve block (IANB) in dental patients taking oral anticoagulants. A total of 352 patients were given a total of 560 injections of local anaesthetic (119 IANB and 441 others). The study group comprised 279 patients with therapeutic international normalised ratios (INRs), and the control group 73 patients who were taking oral anticoagulants but had subtherapeutic INR on the day of operation. Blood was aspirated 7 times (7.3%) during the IANB in the study group. However, there were no clinical signs of prolonged haemorrhage into the medial pterygoid muscle or pterygomandibular space after 96 IANB, including those from whom blood had been aspirated. Only two minor haematomas developed after multiple infiltrations in the lingual sulci. The results suggest that bleeding as a result of the use of local anaesthesia in patients with therapeutic INR is unlikely, provided that the IANB is done correctly.

Keywords: Anticoagulants; Local anaesthesia; Inferior alveolar nerve block

Introduction

Management during oral surgical procedures of patients who are taking anticoagulants has changed drastically during the past decade, but there are still differences in the approaches of oral and maxillofacial surgeons.[1] The balance between reduction in the dose of oral anticoagulants on the one hand, and excessive bleeding during surgery in therapeutically anticoagulated patients on the other, is a major problem, particularly with outpatient procedures.[2] Several protocols have been proposed for such patients,[3,4] and can be summarised as: temporary discontinuation or a reduction in dose of oral anticoagulants to obtain a subtherapeutic international normalised ratio (INR); replacement of oral anticoagulation with heparin or low-molecular weight heparins; or continuation of oral anticoagulation.[5] However, the latest recommendations emphasise that the risk of serious bleeding in patientswith therapeutic INR is small. It has therefore been suggested that the dose of oral anticoagulant should not be discontinued or changed.[2–7]

Interestingly, numerous studies of minor oral surgery in patients taking anticoagulants have failed to mention the possible problem of postoperative haemorrhage as a result of local anaesthesia, although several reports have suggested that block techniques, particularly the inferior alveolar nerve block (IANB), might cause serious bleeding into the medial pterygoid muscle or the surrounding soft tissue.[2,8,9] Based on this, some recommendations have stated that these techniques of local anaesthesia may not be generally advisable in patients taking anticoagulants,[10] or not advisable in those with an INR over 3.[7] However, all the statements seem to be empirical, and lack controlled research. They merely follow guidelines established for the dental treatment of patients with inherited bleeding disorders, mainly hemophilia A,[2,11] although it can be assumed that the risk of haemorrhage in patients with inherited bleeding disorders differs from that in patients taking oral anticoagulants.

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0266-4356/$ – see front matter
doi:10.1016/j.bjoms.2010.11.002

Finally, such statements may cause anxiety among dental practitioners who use any kind of block anaesthesia (mainly the IANB) in such patients being treated in private dental practice. The aim of this long-term prospective study, therefore, was to assess the safety of local infiltration techniques and block anaesthesia in patients taking oral anticoagulants.

Patients and methods

The purpose of this long-term prospective study (from March 2005 to March 2010) was to estimate the safety of local dental anaesthesia in therapeutically anticoagulated patients (INR 2–4). The study was approved by the local Ethics Committee, and written informed consent was obtained from all patients. All patients were treated at the Dental Clinic of Vojvodina, Department of Oral Surgery, Novi Sad, Serbia.

The study included patients taking oral anticoagulants in the long term, whose INR was less than or equal to 4.0 on the day of the operation, and who required simple dental extraction without a mucoperiostal flap being raised. Patients with liver or renal disease and those taking drugs that affected liver function or haemostasis (antiplatelet drugs) were excluded from the study. All patients on oral anticoagulants were divided into two groups: the study group comprised patients with therapeutic INR (2–4); and the control group patients with subtherapeutic values INR (less than 2) on the day of operation.

Local infiltration anaesthesia (supraperiosteal injection and palatal submucous infiltration) in the maxilla was used as described.[12] In the mandible, the IANB was given by a standard intraoral approach, with supplemental buccal infiltration when needed; for lower incisors, local infiltration anaesthesia (labial supraperiosteal and lingual submucous infiltration) was used. In cases where the IANB was not completely successful, intraligamentary injection was added to achieve complete anaesthesia of the lower teeth to be extracted.

Local anaesthetic techniques followed strictly the recommendations generally accepted for safe local anaesthesia in dentistry.[12] It is important to emphasise that we insisted on slow advancement of the needle during IANB (up to about a minute), with repeated injections of a few drops of local anaesthetic solution during advancement. We also insisted on relatively slow deposition of local anaesthetic after the obligatory aspiration check at the point of application.

After the usual pretreatment procedures for selection and grouping of patients with respect to the measured INR, all patients had local anaesthesia induced with two local anaesthetics in regular use – 3% mepivacaine without vasoconstrictor (3% Scandonest®, Septodont, France) and 2% lidocaine with 1/80 000 adrenaline (2% lidokain – adrenalin®, Galenika, Serbia), which were randomly used in both groups of patients. Cartridge-type syringes and 27 G needles were used to give the 3% mepivacaine without vasoconstrictor, and classic disposable syringes and 25 G needles were used to give the 2% lidocaine with 1/80 000 adrenaline.

Table 1
Characteristics of the two groups of patients.

	Study group ($n = 279$)	Control group ($n = 73$)
Age (years)		
Mean (SD)	64.4 (10.3)	64.5 (11.1)
Range	25–87	23–82
Sex		
Male	178	44
Female	101	29
INR		
Mean (SD)	2.62 (0.49)	1.83 (0.1)
Range	2.04–4	1.55–1.98

INR = International normalised ratio.

Operative techniques and postoperative instructions and treatment were as usual. All teeth were extracted by the same surgeon (BB) in outpatients, with minimal surgical trauma and without raising a mucoperiosteal flap. Extraction sockets were packed with collagen or gelatin sponges. Where appropriate (a wide socket or a tendency to immediate bleeding), sutures were put across the socket. All patients were provided with a list of postoperative instructions and a pack of sterile gauze swabs. To find out if bleeding after IANB had occurred, soft tissue swelling in the region of the medial surface of the mandibular ramus was checked immediately after anaesthesia, and signs of trismus and obstruction to the airway recorded during follow up examinations. All participants were examined after 30 min, 2 h, and regularly on the first, second, fourth, and seventh days after the procedure.

Data were analysed with the help of the chi square test and analysis of variance (ANOVA) as appropriate, and probabilities of less than 0.05 were accepted as significant. Data were processed in SPSS (Statistical Package for the Social Sciences; SPSS Inc., Chicago, IL, USA), Windows version 15.0.

Results

The study included 352 patients who were taking oral anticoagulants and who were given a total of 560 injections of local anaesthesia (119 IANB and 441 others). Sixty-five patients were excluded from the study: 54 were taking aspirin and oral anticoagulants; 7 patients had an INR of more than 4.0 on the day of the procedure; and 4 patients who did not come to the control examinations, but were contacted by telephone to exclude any possibilities of haemorrhage.

The study group comprised 279 patients and the control group 73. Characteristics of patients in both groups are shown in Table 1. There was no significant difference between these two groups for sex ($p = 0.67$) or age ($p = 0.92$), but as expected, there was significant difference in INR ($p < 0.0001$). The distribution of the local anaesthetic techniques used are shown in Table 2.

Two different local anaesthetic solutions (with different needle diameters, 25 G and 27 G) were used (Table 3). During 96 IANB both solutions were used in patients with therapeutic INR ranges (2–4), while 23 were done in patients with subtherapeutic INR.