66. ORAL ANTICOAGULANT THERAPY AND REGIONAL ANAESTHESIA - A STUDY IN PATIENTS UNDERGOING ELECTIVE HIP OR KNEE ARTHROPLASTY

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Introduction: Thromboembolism is a common complication following total hip or knee arthroplasty. Whilst the administration of an oral anticoagulant is uncommon in Europe, it is much more common in North America [1]. However, in our hospital, almost all patients undergoing such surgery receive 6 weeks of treatment with warfarin, commencing with 8mg on the evening before surgery. Subsequent doses of 3mg are given on the first and second nights post-operatively with further doses adjusted to a target International Normalised Ratio (INR) of 2.0 to 3.0.

Some controversy exists around the performance of regional anaesthetic techniques and catheter removal in the presence of oral anticoagulants, although a number of authors have produced recommendations [2,3]. The aims of this study were therefore to assess the effect of a loading dose of warfarin on the INR at the time of anaesthesia and to monitor the subsequent degree of anticoagulation with particular emphasis on timing of epidural catheter removal.

Methods: With Local Ethics Committee approval and patient consent we studied 73 patients undergoing elective hip or knee arthroplasty. At the commencement of anaesthesia, a blood sample was taken for the determination of the INR. Details of the surgical and anaesthetic techniques were also recorded, with particular attention to regional anaesthesia. Routine INR measurements were also recorded, where available, for the first 3 days post-operatively.

Results: The mean age in our study was 69.8 years, with a range of 42 to 87 years. Forty-three patients were women and 30 were men. Nineteen were American Society of Anesthesiologists (ASA) grade 1, 43 were ASA 2, 11 were ASA 3 and 1 was ASA grade 4. Forty-one patients received general anaesthesia either as a single technique or in combination with a regional technique. Sixty-one received a spinal anaesthetic, 8 of which were in combination with an epidural catheter.Nine patients were on antiplatelet therapy pre-operatively. Details of the INRs recorded are shown in the table. Values shown are the median plus interquartile range.

Discussion: This study clearly demonstrates that the INR within 24 hours of starting anticoagulant therapy with warfarin is sub-therapeutic and it appears that regional anaesthetic techniques can be safely performed during this time. The average length of time between the first dose of warfarin and start of anaesthesia was 18.1 hours, with a maximum of 22 hours, and the median INR at this time was 1.1. These findings are in keeping with the known pharmacology of warfarin.

In this study there was a clear preference for spinal over epidural anaesthesia, although the ideal anaesthetic for joint replacement surgery is debatable. We have shown that with the dosage schedule used in our hospital, the median INR on the 2nd post-operative morning, around the time that an epidural catheter would be removed, was 1.7 (interquartile range 1.4 to 1.9). Previous studies of post-operative epidural anaesthesia in patients receiving oral anticoagulants have suggested that epidural catheter insertion and removal is safe, but the level of anticoagulation at time of catheter removal in these studies was slightly less than in ours [4,5]. These studies, as with ours, have shown a wide variability in the response to warfarin – 7 out of 56 patients (12.5%) in this study had an INR above 2.5 on the 2nd post-operative morning. Thus it has been recommended that all patients should be closely monitored following catheter removal for neurological deterioration suggestive of spinal haematoma [4,5]. Similar recommendations have since been produced by the American Society of Regional Anesthesia [6].

We have also shown that a significant number of patients will have sub-therapeutic INRs for several days following surgery and would therefore seem to be at risk for thromboembolism. Debate continues as to the efficacy of warfarin for thromboprophylaxis.

In conclusion, it appears that regional anaesthesia can be performed safely within 24 hours of a loading dose of 8mg of warfarin. Whilst removal of epidural catheters appears safe, a significant number of patients would probably be at increased risk of spinal haematoma were epidural analgesia more popular in our unit. This study has led us to review our thromboprophylaxis protocols in collaboration with our orthopaedic surgical colleagues.

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5. Wu CL, Perkins FM. Oral anticoagulant prophylaxis and epidural catheter removal. Reg Anesth 1996; 21: 517-24.

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Time	INR Value
Pre-op	1.0 (1.0-1.1) n=21
In OR	1.1 (1.0-1.1) n=68
1st post-op morning	1.5 (1.4-1.8) n=33
2nd post-op morning	1.7 (1.4-1.9) n=56
3rd post-op morning	1.7 (1.4-2.1) n=56