Correspondence

We welcome letters to the Editor concerning articles which have recently been published. Such letters will be subject to the usual stages of selection and editing; where appropriate the authors of the original article will be offered the opportunity to reply.

Letters should normally be under 300 words in length, *double-spaced throughout*, signed by all authors and fully referenced. The edited version will be returned for approval before publication.

Prevention of deep-vein thrombosis after total knee replacement

Sir,

The article by Blanchard et al[1] in the July 1999 issue entitled 'Prevention of deep-vein thrombosis after total knee replacement' is of particular interest and their findings raise several issues.

They state that there was no statistically significant difference in the prophylactic effect of the A-V Impulse System and low-molecular-weight heparin (LMWH, Fraxiparine), with respect to the potentially more dangerous proximal, deep-venous thrombosis (DVT), both treatments being associated with lower levels than would have been expected in the absence of effective prophylaxis. There was, however, a significantly higher incidence of total DVT in the A-V Impulse System group. This is not surprising since, by the authors' own admission, elastic stockings were not used in patients in the A-V Impulse System group. This is contrary to the manufacturer's recommendations. Other studies[2,3] have shown that when used in conjunction with graduated elastic compression, the A-V Impulse System is as effective as LMWH in the prophylaxis of both total and proximal DVT. In particular, the much larger study by Warwick et al[2] showed that there was no statistically significant difference between the two treatments in terms of the incidence of total and proximal DVT, but that there were fewer soft-tissue side-effects associated with the Impulse System.

There is some ambiguity in regard to those patients discontinued from the A-V Impulse System group. Blanchard et al state that 16 patients in this group were discontinued, and since 63 were originally allocated to it, then 47 should have been available for objective DVT analysis. In the event, however, a total of 59 patients was included for objective DVT analysis. This suggests that in accordance with the protocol described by the authors, 12 patients discontinued from the mechanical group must therefore have gone on to receive LMWH before assessment of DVT. Neither the dose of LMWH to which these patients were exposed nor the rationale for the scientific acceptability of this practice is indicated in the paper.

One patient in the LMWH group had a major haemorrhage after operation which required a transfusion of 5.5 litres of blood. It is surprising that the authors attach relatively little importance to a bleed of this magnitude and severity. They conclude that the incidence of troublesome bleeding in the LMWH group, a matter of concern for all orthopaedic surgeons, was "less important than anticipated" and yet state that the 95% confidence interval (0.04 to 8.3) does not exclude the possibility of a higher frequency of severe bleeding.

In the light of recent debate concerning the justification for thromboprophylaxis, when the incidence of pulmonary embolism is known to be much lower than previously thought, the appearance of such complications is of paramount importance. It is imperative that this balance between risk and benefit is considered when selecting the appropriate method of prophylaxis for high-risk patients.

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1. **Blanchard J, Meuwly J-Y, Leyvraz P-F, et al.** Prevention of deep-vein thrombosis after total knee replacement. *J Bone Joint Surg [Br]* 1999;81-B:654-9.
2. **Warwick DJ, et al.** *Pneumatic plantar compression versus low molecular weight heparin for the prevention of deep-vein thrombosis after total knee replacement.* 4th Congress of European Federation National Associations Orthopaedics and Trauma (EFORT), Brussels, June, 1999.
3. **Funk L, et al.** *Comparison of the prophylaxis of deep venous thrombosis in total knee arthroplasty.* Presented at the BOA, Glasgow, September, 1999.

Authors' reply:

Sir,

The issues raised by Dr Goldberg are well taken. First, the aim of our study was to compare the efficacy and safety of two antithrombotic regimens in total knee replacement (TKR) namely, a once-daily subcutaneous injection of nadroparin, a low-molecular-weight heparin (LMWH) and the use of a novel intermittent compression system of the foot, the A-V Impulse System, marketed by Dr Goldberg's company. Elastic stockings were not part of the study. It is possible that the combination of the A-V Impulse System with stockings would be more efficacious than the compression system alone but this remains to be established in an appropriate controlled, randomised study.

Secondly, the results were analysed on an intention-to-treat principle, which means that patients who discontinued one prophylactic regimen were still considered as being in the group to which they had been assigned initially in a random fashion. Of course, they had prophylactic LMWH after discontinuation of mechanical prevention, which should have had a positive rather than a negative influence on the results in the A-V Impulse System group. Finally, it is true that the only case of severe bleeding (1.5%; 95% CI 0.04 to 8.3) which occurred during the study was in the LMWH group. This adverse event should not obscure the fact that patients allocated to mechanical prophylaxis had twice as much evidence of DVT on phlebography than those given LMWH, a prevalence of 64.6% which is close to that reported with no prophylaxis. The definite superiority of LMWH compared with the foot pump system in TKR has also recently been reported in a small Swedish study.[1]

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