Ardeparin plus graduated compression stockings prevented DVT after knee surgery


Objective
To compare the combination of ardeparin—a low-molecular-weight heparin (LMWH)—and graduated compression stockings (GCSs) with GCSs alone for prevention of deep venous thrombosis (DVT) in patients having major knee surgery.

Design
Randomized, double-blind, placebo-controlled trial with 14-day follow-up.

Setting
5 hospitals in Canada.

Patients
246 patients (mean age 68 y, 60% women) who were having total knee replacement or tibial osteotomy. Exclusion criteria included age < 30 years; increased risk for bleeding or thrombosis; allergy to iodine, radiopaque dye, heparin, pork, or fish; alcohol or drug abuse; uncontrolled hypertension; requirement for aspirin therapy; bilateral knee surgery; or inability to wear stockings. Follow-up was complete.

Intervention
Patients were allocated to subcutaneous ardeparin, 0.005 mL/kg of body weight (50 anti-Xa units/kg) twice daily (n = 122) or placebo (n = 124) for 14 days or until hospital discharge. Patients in both groups were fitted with GCSs below the knees immediately after wound closure.

Main outcome measures
Patients had bilateral venography before hospital discharge. Occurrence of DVT, proximal DVT, pulmonary embolism, and major bleeding.

Main results
199 patients had evaluable venograms. Of these, DVT was detected in 28 patients (29%) who received ardeparin compared with 60 patients (58%) who received placebo (P < 0.001). (This absolute risk reduction (ARR) of 29% means that 3 patients would need to be treated (NNT) with ardeparin in addition to GCSs compared with placebo injections plus GCSs) for 14 days to prevent 1 additional patient from having DVT (95% CI 2 to 6); the relative risk reduction (RRR) was 50%, CI 30% to 65%).* Proximal DVT was also reduced in patients who received ardeparin compared with those who received placebo (2% vs 16%, P < 0.001 (ARR 14%; NNT 7, CI 5 to 16; RRR 87%, CI 50% to 97%)). Pulmonary embolism was confirmed in 1 patient in each group. Major hemorrhage did not differ between groups (2.5% vs 2.4%, P < 0.99).

Conclusion
The combination of ardeparin and graduated compression stockings reduced total and proximal deep venous thrombosis compared with stockings alone in patients having major knee surgery.

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*Numbers calculated from data in article.


Commentary
DVT remains a substantial complication after major knee surgery despite multiple prophylactic methods. The incidence of DVT is approximately 60% if no prophylaxis is used and ranges from 11% to 79% with use of intermittent compression stockings, LMWH, low-dose heparin, warfarin, or aspirin (1). LMWHs are the newest prophylactic methods. The high rate of distal DVT occurring with all prophylactic measures (27% in this study) raises the possibility of proximal clot propagation after discharge from the hospital. DVT outcomes were measured with bilateral venograms when ardeparin or placebo therapy was stopped at 14 days or at hospital discharge. The study would have been strengthened with longer (6 months) follow-up.

This study, along with previous studies of LMWH, confirms the effectiveness and safety of LMWH as prophylaxis against DVT in patients having knee surgery.

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References