Low-molecular-weight heparin at home was as effective as unfractionated heparin in the hospital in proximal DVT

Koopman MM, Prandoni P, Piovella F, et al. ***Treatment of venous thrombosis with intravenous unfractionated heparin administered in the hospital as compared with subcutaneous low-molecular-weight heparin administered at home.*** *N Engl J Med. 1996 Mar 14;334:682-7.*

Objective
To compare the effectiveness of subcutaneous low-molecular-weight heparin (LMWH) administered at home with intravenous unfractionated (standard) heparin administered in the hospital in patients with deep venous thrombosis (DVT).

Design
Randomized controlled trial with 24-week follow-up.

Setting
Hospitals in Europe, Australia, and New Zealand.

Patients
400 consecutive outpatients (mean age 61 y, 51% men) with acute symptomatic proximal DVT (thrombosis in the popliteal vein or a more proximal vein) confirmed by venography or ultrasonography. Exclusion criteria were DVT in the previous 2 years, pulmonary embolism, previous treatment with heparin for > 24 hours, geographic inaccessibility, a life expectancy of < 6 months, overt post-thrombotic syndrome, age < 18 years, or pregnancy. Follow-up was complete.

Intervention
202 patients were allocated to receive LMWH, twice-daily injections of nadroparin-Ca (Fraxiparine, Sanofi Winthrop, Paris) in doses adjusted for the patient's weight, administered at home. No laboratory monitoring was done in this group. 198 patients were allocated to intravenous standard heparin, a bolus dose of 5000 IU followed by a continuous infusion of 1250 IU per hour, in the hospital. Infusion was adjusted to maintain activated partial-thromboplastin time at 1.5 to 2.0 times the normal value. All patients received oral anticoagulant treatment initiated on the first day and continued for a total of 3 months.

Main outcome measures
Symptomatic recurrent venous thromboembolism, major bleeding, quality of life, and days in the hospital.

Main results
The mean duration of study treatment was 6 days in both groups. 14 patients (6.9%) receiving LMWH had symptomatic recurrent thromboembolism compared with 17 patients (8.6%) assigned to standard heparin (absolute difference 1.7%, 95% CI −3.6% to 6.9% {$P = 0.54$}*). 1 patient (0.5%) assigned to LMWH had major hemorrhagic complications compared with 4 patients (2%) assigned to standard heparin {$P = 0.17$}*. Quality of life improved in both groups. Physical activity and social functioning were better in patients assigned to LMWH. 75% of the patients assigned to LMWH were not hospitalized or were discharged early. The mean number of days in the hospital was reduced by 67% in patients assigned to LMWH.

Conclusion
Low-molecular-weight heparin administered at home was as effective and safe as unfractionated heparin administered in the hospital in patients with proximal deep venous thrombosis.

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For article reprint: Dr. M. M. Koopman, Academic Medical Center, University of Amsterdam, Center for Hemostasis, Thrombosis, Atherosclerosis, and Inflammation Research, Room F4-133, Meibergdreef 9, 1105 AZ Amsterdam, the Netherlands.

*Numbers calculated from data in article.

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Commentary

Anticoagulant therapy is the treatment of choice for most patients with DVT. Patients are usually treated in the hospital with intravenous unfractionated heparin followed by oral anticoagulants for at least 3 months.

LMWH preparations compared with standard heparin have a longer plasma half-life, a less variable anticoagulant response, and a more favorable antithrombotic-to-hemorrhage ratio (1). LMWH compounds have been found to be safe and effective in the prophylaxis of venous thromboembolism (2) and in the treatment of acute proximal DVT (3, 4).

These 2 recent studies by Levine and Koopman and their colleagues provide further evidence that LMWH given at home is safe and effective for initial treatment of acute proximal DVT in selected patients. These 2 multinational, randomized studies, although unblinded, were carefully done to minimize bias. Although 2 different LMWH compounds were used, the results were similar. Because each LMWH compound is distinct in its activity (1), multiple, large clinical trials are needed.

Clearly, reducing hospitalization is an increasingly important part of patient management. Both of these studies have shown that LMWH given at home without laboratory monitoring is a cost-effective initial treatment for acute proximal DVT. The incidence of severe hemorrhagic events or life-threatening pulmonary embolism during the initial treatment was exceedingly low in both studies. The need for hospitalization to monitor patients, therefore, does not seem warranted.

In the study by Levine and colleagues, approximately two-thirds of the patients with acute proximal DVT were excluded;

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