

## CLINICAL UPDATE

## Economy-class syndrome?

Scurr JH, Machin SJ, Bailey-King S, Mackie IJ, McDonald S, Coleridge Smith PD. Frequency and prevention of symptomless deep-vein thrombosis in long-haul flights: a randomised trial. *Lancet* 2001;357:1485-89.

**Background:** More than a century has passed since Virchow described an association between venous stasis and thrombosis,<sup>1</sup> but the precise link between prolonged travel and the risk of deep-vein thrombosis (DVT) remains uncertain.

**Question:** In patients flying long distances, what is the risk of DVT in the lower limb, with and without the use of prophylactic graduated elastic compression stockings?

**Design:** This pilot study, conducted in the United Kingdom, enrolled 231 healthy volunteers over 50 years of age who intended to take an economy-class, round-trip flight. Each flight lasted at least 8 hours, and the return flight was completed within 6 weeks. Exclusion criteria included prior episodes of venous thrombosis, use of anticoagulants, use of compression stockings, cardiorespiratory problems and other serious illnesses, including malignancy. A baseline duplex ultrasonography was performed to detect evidence of previous DVT and a blood sample collected to test for thrombophilia. Half of the volunteers were randomly assigned to wear class I below-knee elastic compression stockings during air travel; the control group received no prophylactic treatment. The primary outcome was the occurrence of DVT in the lower limb, as detected during a follow-up duplex ultrasound examination performed within 48 hours after the return flight by a technician unaware of the treatment allocation.

**Results:** There were 115 travellers assigned to wear stockings and 116 in the control group. The baseline characteristics were similar for the 2 groups except for a higher number of women (81 v. 61) and of people receiving hormone replacement therapy (16 v. 8) in the group wearing stockings. A similar number of travellers in each group — 31 in all — were lost to follow-up; in the end, 100 travellers in each group underwent a follow-up duplex ultrasound examination. None of the travellers (95% confidence interval [CI] 0%–3.2%) in the stocking group had DVT, whereas 12 travellers (10%; 95% CI 4.8%–16.0%) in the control group had asymptomatic DVT in the calf. Superficial thrombophlebitis developed in 4 (3%) of the travellers in the stocking group (95% CI 1.0%–8.7%), as compared with none in the control group (95% CI 0%–3.1%). Factor V Leiden and prothrombin G20210A gene mutations were present, respectively, in 4 and 3 travellers in the stocking group, as compared with 7 and 1 travellers in the control group. Of the 12 control subjects in whom DVT developed, 2 were positive for Factor V Leiden only. Of the 4 travellers in the stocking group in whom superficial thrombophlebitis developed, one was positive for both gene mutations.

**Commentary:** The diagnosis of DVT using duplex ultrasonography relies on a technician's subjective interpretation, particularly when examining calf veins. The 10% incidence of DVT in the control group was surprisingly high, and the use of the elastic stockings surprisingly effective.<sup>2</sup> This raises 2 questions.



Were the ultrasound technicians fully blinded to the travellers' treatment allocation, and could some conversation have taken place during the ultrasound examination?

**Practice implications:** It remains unclear whether air travel is a significant risk factor for DVT. Nevertheless, it is reasonable for physicians to recommend regular leg muscle contractions and adequate hydration during long-distance flights. The use of elastic compression stockings can be considered for patients at high risk, such as those with prior venous thromboembolism or thrombophilia, although the possible side effect of superficial thrombophlebitis should be considered. — Benjamin H. Chen

The Clinical Update section is edited by Dr. Donald Farquhar, head of the Division of Internal Medicine at Queen's University, Kingston, Ont. The updates are written by members of the division.

## References

1. Rogers JS 2nd. Hypercoagulable states. *W V Med J* 1993;89:61-3.
2. Hirsh J, O'Donnell MJ. Venous thromboembolism after long flights: Are airlines to blame? *Lancet* 2001;357:1461-2.