

# The end of the economy class syndrome

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**TITLE 1** Air travel and venous thromboembolism: a systematic review.

**TITLE 2** The absolute risk of venous thrombosis after air travel: a cohort study of 8,755 employees of international organisations.

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**LIST OF ABBREVIATIONS** Deep venous thrombosis (DVT), low molecular weight heparin (LMWH), person-years (PY), randomised controlled trials (RCTs), venous thromboembolism (VTE)

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## PAPER ONE

### SUMMARY

The objective was to carry out a systematic review of clinical studies principally identified from Medline, from January 1966 through to December 2005, which either reported primary data concerning travel as a risk factor for VTE or tested preventive measures for travel-related VTE. Twenty-five studies met the inclusion criteria, six case-control studies, ten cohort studies, and nine RCTs. In RCTs and cohort studies evaluating air travel, the risk of asymptomatic VTE ranged from 0% to 12%, but risk of symptomatic VTE was only 27 per one million travellers. Multivariate logistic regression analysis showed increased risk of air travel-related VTE to be associated with flights with a mean duration >8 hours, and also those who had had more than one previous DVT and those with a prothrombotic blood disorder, body weight >90 kg, limited mobility, cancer, or large varicose veins. In nine studies (126 patients with VTE), additional risk factors were age >40 years and the use of female hormones. In six RCTs (n=2482) evaluating air travel, use of compression stockings conferred a lower incidence of DVT than did no intervention (0.2% v 3.7%, p <0.001) and aspirin did not. Low molecular weight heparin showed a trend toward efficacy in one study.

## PAPER TWO

### SUMMARY

A cohort study was conducted on 9,000 employees of large international companies and organisations, who were followed between 1 January 2000 and 31 December 2005. The details of flights taken by each employee were obtained from company records. The occurrence of symptomatic venous thrombosis was linked to exposure to air travel, as assessed by travel records provided by the companies and organisations and a web-based questionnaire completed by the employees about whether they had developed VTE and what risk factors they had for the condition. In the follow-up period, 4.4 years, 53 thromboses occurred, 22 of which were within 8 weeks of a long-haul flight, yielding an incidence rate of 3.2/1,000 PY, as compared to 1.0/1,000 PY in individuals not exposed to air travel (incidence rate ratio 3.2, 95% confidence interval 1.8–5.6). This rate was equivalent to a risk of one event per 4,656 long-haul flights. The risk increased with exposure to more flights within a short time frame and with increasing duration of flights. The incidence was highest in the first two weeks after travel and gradually decreased to baseline after eight weeks. The risk was particularly high in employees under age 30 years, women who used oral contraceptives, and individuals who were particularly short, tall, or overweight.

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## OPINION

I wonder if you have noticed that talk of the prevention of travel-related VTE has disappeared from the popular press? Although I doubt a causal relationship, two new papers suggest that the risk of VTE in flights of less than eight hours' duration is very small and, indeed, the authors of both papers suggest that for all but a few there is no need to take antithrombotic measures or wear graduated compression stockings.

However, age, obesity, female hormones, co-morbid conditions including cancer and varicose veins and interval between flights are still concerns. Indeed, in a new paper<sup>2</sup> evaluating the risk of VTE in the absence of flying, obesity, oral contraceptives and prothrombotic mutations in a large population-based case-control study

of 3,834 patients, 2,152 partner controls and 2,531 random controls were important. The increased risk to obese women taking oral contraceptives is twenty-four-fold. In summary, the overall risk of a VTE to jet-setters participating in the international conference circuit is at worst only three times greater than that in the general population and small enough to make it inappropriate to take anticoagulant drugs even for long haul flights. However, several studies have shown graduated compression stockings to be worthwhile. The higher risk to young travellers (new consultants or lab chiefs under 30) may be due to 'attrition of susceptibles', i.e. susceptible individuals are more likely to develop a disease shortly after their exposure to risk. Unfortunately the studies do not examine the protection or otherwise of flying business class.

## REFERENCES

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- 2 Pomp ER, le Cessie S, Rosendaal FR *et al.* Risk of venous thrombosis: obesity and its joint effect with oral contraceptive use and prothrombotic mutations. *Br J Haematol* 2007; **139**:289–96.