

Travellers Thrombosis

“LONDON – Medical experts are calling on airlines and regulators to warn long haul passengers about ‘economy class syndrome’ – potentially fatal in-flight blood clots which may affect thousands each year’.”

The NZ Herald. January 2001? No, November 1998 in fact! Why the sudden media interest in thrombosis in travellers? This is a question I can't answer but I welcome the issue being raised – if not only because it emphasizes the point I continuously try to make with travellers, travel consultants and the medical profession advising travellers – there is far more to travel health than just vaccines! DVT's are not the only air travel related health issues that are being raised by journalists.

In the Sunday Times of January 21, Stacy Greg writes ‘...welcome to the modern world of travel. Where aircrafts serve as a flying cattle-pen for the cramped, miserable masses...topping the list of current travel-related concerns is deep vein thrombosis...however, frequent fliers should be aware of the other risks air travel entails. Specifically, experts say, the effects of cumulative exposure to cosmic radiation’ (more about these ‘experts’ later). In a side bar she goes on to list these other hazards of air travel – ‘sick air syndrome’; lack of oxygen; insecticide intolerance; jetlag related breast cancer; ‘jetsetters melanoma; and premature ageing from sleep deprivation. Do we need to worry about some of the more sensationalized press articles related to the safety of air travel? Our patients will be reading these articles – having a clear understanding of the evidence will help us advise our traveling patients appropriately.

In this issue the subject of travellers thrombosis will be discussed. Next issue, cosmic radiation, stress and airline travel and the affect of the cabin environment on some pre-existing conditions will be discussed.

In November 2000, the House of Lords Select Committee on Science & Technology tabled a report on the health risks of air travel. This report identified four main areas of medical concern – the incidence of thrombosis in travellers; the transmission of infection; the effects of the cabin environment on vulnerable individuals and the management of in-flight emergencies. In their summary they wrote ‘while we acknowledged the possibility that there might be some gaps in...knowledge, we were surprised to find that there were so many. In the absence of accessible and authoritative information, it is not surprising that rumour and speculation thrive.’ They urged that rigorous epidemiological studies be carried out as soon as possible to allow a more scientific approach to the issue.

So what do we know about thrombosis in travellers? We all remember Virchow's triad from medical school – the three factors associated with thrombosis:

1. Stasis
2. Excessive coagulability
3. Damage to the blood vessel walls

The presence of one or more of these factors in a healthy person can lead to an increased possibility of a clot forming. Most of our present knowledge on DVT is based on post-surgical patients – this data may not reflect the natural history of travel related DVT. 60 years ago the late Professor Keith Simpson published data that showed a sharp increase in the incidence of pulmonary embolism in people who had spent long periods immobile in air raid shelters. This was the first strong evidence that thrombosis was causally linked with spatial confinement, immobility and constrained seating conditions.

Certainly these conditions are the norm in aircraft these days. What of the actual cabin environment? In a recent issue of the Lancet a Norwegian study was published in which 20 men were placed for 8 hours in a pressurized room that mimicked the condition in an aircraft cabin at cruising altitude. Dr Bjorn Bendz and his colleagues wrote ‘our study suggests that a rapid exposure to an air pressure encountered in airplane cabin activates coagulation. This activation is probably clinically relevant.’ In the previous issue a retrospective study on patients with DVT showed no link between travel and the formation of thrombosis.

In contrast a 1998 study conducted in France showed that those who had recently undergone a long journey were four times more likely to have a DVT – however more of their patients had been on long car journeys than long flights. My colleague at the Travel Doctor – Alastair Borwick, looked at a prospective series of 50 patients with DVT seen by him in Liverpool – only one had a significant travel history. It is clear that some well-constructed studies are needed to back up the anecdotal evidence that is accumulating on this issue.

The incidence of DVT in travellers needs to be looked at against the background incidence the general population. Up to 20% of the population is thought to have some degree of hypercoagulability. Whilst there are no published prospective studies on the incidence of DVT, retrospective studies show that the underlying incidence of disease increases with increasing age, averaging an overall rate of around 1 in 10 000 people per

year. According to the House of Lords report, when looking at the number of people developing thrombosis after travel, 'the fundamental question yet to be answered is whether this number is greater than the number from an equivalent population who would have developed DVT if they had not recently flown'.

From studies on surgical patients various factors have generally been agreed to be predisposing factors to the development of DVT.

- Increasing age above 40 years
- Pregnancy
- Former or current malignant disease
- Hypercoagulability states (factor 5 leiden etc)
- Personal or family history of DVT/PE
- Recent major surgery or surgery, especially to the lower limb or abdomen
- Oestrogen hormone therapy
- Immobilization for > 24 hours
- Dehydration

The following factors are not universally agreed upon

- Varicose veins
- Smoking
- Obesity

Additionally there are postulated risk factors related to long distance travel of all kinds, and some that are unique to the aircraft environment. The report emphasises the point 'it must be reiterated here that there are no data currently available by which the contribution of air travel to the overall risk of DVT from any of these factors, singly or in combination, can be estimated.'

Postulated risk factors for long distance travel by all means of transport

- Increasing age above childhood
- Increasing duration of travel
- Increasing frequency of long-distance travel
- Immobility
- Seating constraints, particularly leg room
- Seated posture, including when asleep
- Wearing of tight undergarments or movement restricting clothing

Postulated factors within the aircraft cabin

- Reduced pressure leading to abdominal distension acting against venous return from the legs
- Reduced oxygen or pressure leading to increased clotting tendency
- Low humidity affecting body fluid content
- Excessive consumption of alcohol and coffee leading to dehydration
- Cabin crew activities discouraging mobility
- Increasing duration of non-stop flight sectors

Personal risk factors that could be compounded by the travel environment

- Obesity – compounding immobility and seating discomfort
- Height – compounding mobility, seating and posture constraints

Their final comments state – ‘if there is an increased risk of DVT solely from flying, it is small’ and that ‘for healthy individuals, the risk of getting a clinically significant DVT solely because they are taking a flight seems to be exceeding small. For those who are already at risk, there may be additional risk from flying, but it is not currently quantifiable.’ They then go on to say that these conclusions can only be tentative until some rigorous studies have been completed.

So what do we tell our travellers?

With all this media hype they are unlikely to accept simple dismissal of their fears – instead an assessment of their potential risk factors and advice based upon that seems a sensible option. Let us not forget that travellers come to get our advice before they travel in order to stay healthy or avoid adding any burden of illness if they are already suffering from a chronic disease.

The interim advice from the House of Lords report is:

Those with no known predisposing factors

- Move around as much as possible
- Exercise calf muscles whilst seated with half hourly flexing and rotating of ankles
- Avoid excessive alcohol and caffeine containing drinks, both before and during the flight
- Drink only water or juices when thirsty

Those at minor risk (aged over 40, very tall, obese, extensive varicose veins, recent minor leg surgery or minor body surgery, previous or current leg swelling from any cause)

- As above plus
- Take only short periods of sleep, unless you can lie down
- Avoid sleeping pills
- Consider wearing support stockings

Those at moderate risk (recent heart disease, pregnant or on any hormone medication, esp. the OCP & HRT, recent major leg injury or leg surgery, family history of DVT)

- As above plus
- Take professional advice about risk involved
- Take professional advice about the need to wear compression stockings

Those at substantial risk (previous DVT, known clotting tendency, recent major surgery, current malignant disease, paralyzed lower limbs)

- All the above plus low molecular weight heparin

Many people are taking aspirin in an attempt to prevent thrombosis. Dr McLintock, one of the haematologists at Diagnostic-Medlab shared the views of herself and her colleagues. Last year a study was published in the Lancet showed a very small decrease in the incidence of pulmonary embolism in post surgical hip replacement patients – this is a totally different group of patients, at far greater risk of DVT than the average traveller. If this group of patients showed such a small such a small decrease one would expect the effect in travellers to be minute.

Their other concerns were that taking aspirin could lead to a false sense of security – that people would think they were doing something, when in fact they were probably doing nothing to help prevent thrombosis. Additionally, as aspirin is an anti-inflammatory it may mask the symptoms of a DVT and subsequently result in a delayed diagnosis. We do not currently endorse the use of aspirin in our clinics – essentially everyone gets general advice, and those that fit into higher risk categories are advised about either compression stockings or low molecular weight heparin.