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Guilding the Profession Protecting the Public

TRAVEL MEDICINE Dislodging the travel clot

Galaxie Knight fell out of her aisle seat onto the floor. The 72 year old lady was on a flight from London to Cape Town when she suffered a cardiac arrest, later found to have been caused by a pulmonary embolus (PE). She was lucky; if she was sitting next to the window the chances are that no one would have noticed her slumped against the window until it was too late. She was also lucky from another point of view; there were two cardiologists on board who managed to revive her.

The bare facts and figures don't lie and make for interesting reading. Deep vein thrombosis or clotting in the veins, more commonly known as DVT, is mostly found in the deep veins of the lower limbs. The great fear is always that it can dislodge from its often unsuspected hiding place there and shoot off to the lungs, causing a PE which can be fatal, as was the case with the popular Morning Live presenter Vuyo Mbuli. The collective term for these clotting problems is venothromboembolism, VTE. Headlines often scream of 'economy class syndrome!' and I have heard shrieks of 'cattle class clusters' when reference is made to air travel and VTE. The reality is that VTE IS associated with travelling by plane. It IS also associated with aging and certain diseases. Yes, it definitely IS also associated with long distance travel by train, bus and car.

So back to the figures for VTE, and let's look at how it affects us in everyday life as the the non-travelling population. In the USA there are probably up to 900 000 cases a year with 100 000 deaths. In the United Kingdom, if we add up all deaths due to breast cancer, prostate

Long distance air travel increases the risk of VTE by a factor of two to four times compared to the non-travelling population

cancer, motor vehicle accidents and HIV, and double that total, the figure would still be less than the deaths attributable to VTE. In South African hospitals in the normal medical wards, the prevalence of VTE is between 10%-20%. This rises to 80% in polytrauma, critical care and spinal injury units. VTE is indeed an event most medical personnel would encounter sooner or later.

The incidence of VTE after long distance air travel is difficult to evaluate as very few specific studies have been done. Most experts consider a VTE to be travel related if it occurs during or within four weeks of a long haul flight of more than 4-8 hours. Some even use a cut off figure of eight weeks. Others also include passengers who undertook multiple short flights of less than three hours duration each in a three week period. The only certainty, after pooling all investigations and doing meta-analyses, is that long distance air travel increases the risk of VTE by a factor of two to four times compared to the non-travelling population. One study quantified this risk per traveller as one in 4656 flights of more than 4 hour duration each. This seems like an extremely slim chance.

But numbers can be presented in different ways. Most authorities state that 1% of long distance travellers have asymptomatic DVT's. These DVT's most likely spontaneously resolve with no remnants and

with the passenger never even being aware of it. Not much is known about the fate of these potential missiles

> lurking deep down in our extremities as passengers scatter all over the globe upon disembarking and are lost to medical follow up. But the numbers potentially affected



Exit row seats have much more legroom



Compression of the veins behind the knee against the edge of the seat is cosidered to impair blood flow



Flying business class does not significantly reduce VTE risk

are staggering. An airport such as OR Tambo in Johannesburg had 7.9 million international passengers passing through it in 2010. Even if 1% of them had an asymptomatic DVT, that would translate into 70 000 cases annually or 216 daily!

Intuitively long distance air travel should increase the risk of DVT's.

Firstly, cramped conditions lead to compression of the veins at the back of the knee against the edge of the seat, altering blood flow. Secondly, the very low humidity inside the aircraft is supposed to lead to a state of relative dehydration and concentration of the constituents of blood. Finally, some passengers may have damage to their blood vessels for a myriad of medical reasons. These three components of Virchow's triad are supposed to favour clotting, thrombus formation and potentially a fatal PE. Yet the studies that have been done have not been conclusive. The only salient point is that the duration of the flight increases the risk of a VTE, but this risk is exceedingly difficult to quantify and probably does not warrant more than common sense preventative measures in the otherwise healthy traveller.

The worry is of course the occurrence of a severe DVT or fatal PE. The incidence of this is exceedingly rare in travellers, with recent studies reporting figures of up to five per million travellers, though one early study had an incidence of 44 per

million travellers. Certain risk factors have been clearly identified in passengers, and this has led to their stratification into three groups. The high risk group includes those who had a previous VTE, have some form of malignancy, have severe underlying medical conditions, have a

Taller than 180cm increases the risk

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known hereditary clotting tendency, had major surgery in the past few weeks, or are immobilised due to factors as paralysis or having a limb in a plaster cast. Age is also an important factor, as the incidence of VTE rises from about 8/million passengers in passengers below 40 years old to 140/million in those older than 75. Those at high risk should be evaluated for the appropriate administration of an injection of low molecular weight heparin (LMWH).

The medium risk group include those with a family history of VTE, ladies on combined oral contraception, those with large varicose veins, obese passengers, the very tall (over 180cm) and the very short (less than 160cm). Pregnancy on its own is considered a hypercoaguable state; how much more flying adds to the risk of developing a VTE is presently unknown. Passengers in the medium risk group should consider wearing graduated compression stockings. These should be properly fitted by an experienced nurse so that the correct pressure at the ankles is maintained. Some passengers with a number of medium risk factors may also be considered for prophylactic LMWH.

> Aisle seats are recommended for the high and medium risk groups with frequent mobilisation at periods ranging from every thirty minutes to every two hours if practical. Certain seats, such as those immediately behind business class and those in the emergency exit rows, have more legroom and are easier to mobilise from. It is known that the risk for VTE is doubled in window seated passengers, probably due to reduced mobility. Flying business class however does not reduce the risk. It would be interesting to study the effect of flying in the super luxurious and spacious first class cabins of the newer aircrafts. I am sure there will be no shortage of volunteers!

> The low risk group constitutes the otherwise healthy passenger for whom flying poses a slightly increased but indeterminate risk of getting a VTE. This group is advised, as is the other two risk groups, not to wear constrictive clothing around the waist or lower extremities, maintain good hydration, and exercise the calf muscles regularly. Most airlines have suggested exercises as part of their passenger

advisory services. The use of aspirin is not advised as its adverse affects are significantly more than its benefits. Its use is mainly on the arterial side of the circulation, where it prevents heart attacks and strokes, and not as much on the venous side.



Window seats doubles the risk of developing a VTE. Sleeping slightly increases it as well



A VTE after multiple short flight in a three week period is also considere travel related