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(DVT) DEEP VENOUS THROMBOSIS AND TRAVELLING

Over the last years studies have shown that there is an elevated risk of symptomatic deep venous thrombosis with risk of complications (lung emboles) during long-distance flights from 4 hours: 1/6.000 travellers undertaking a long distance flight, in accordance to the incidence in the general population of 1-3/1.000 persons per year (1/100.000 in young adults – 1/100 in old people). The risk also increases with **travelling time:** a flight of more than 4 hours doubles the risk of thrombosis from 2 to 4 as compared to a flight less than 4 hours. In flights of 12 hours or more, the risk is 10 times higher. According to a couple of studies, it is assumed that the risk might be strongly increased with **pre-existing** risk factors (see further). It is still uncertain if there is an elevated risk in case of complete absence of (known or unknown) risk factors. Some authors claim that at least 5 % of all venous thrombo-embolic problems are related to travelling. Over the coming years the current studies should provide us with more precise information.

The prolonged immobility (very likely although not certainly enhanced by a limited sitting place and/or the veins being caught during a longer time by the edge of the seat) during flights is responsible for the creation of venous stasis. This explains why tall people (> 1,90m) and small people (< 1,60m) run up to 6x more risk. Other factors such as dehydratation and hypoxemia (low oxygen content), play a part, but recent studies don't confirm these hypotheses (there might be a small contribution of the hypoxemia to the clotting tendency). The term "*economy class syndrome*" is not correct and should not be used anymore because the problems may also arise in travellers who booked "business class", or in those travelling by car, bus or train. The term **"travel related thrombosis"** is therefore preferred.

DVT and/or PE symptoms do not always occur immediately. They can appear from within a few hours to 2 weeks after arrival, the risk remaining elevated until 8 weeks after return.

Different pre-existing factors are indicated as risk factors (based on the directives of WHO 2012 and CDC 2014):

- a personal anamnesis of deep venous thrombosis or lung embolisms; an anamnesis of deep venous thrombosis or lung embolisms in a relative in the first degree
- the use of oestrogen (oral contraceptives; menopausal complaints);
- pregnancy and the first month post natal;

- recent surgery or trauma, especially in case of surgery of the abdomen or of the lower limbs; immobilisation of the lower limbs by cause of paralysis or plaster, etc.;
- cancer; taking tamoxifen, certainly in association with cytostatic;
- congenital or acquired increased blood clotting;
- severe obesity

Furthermore the following is quoted:

- recent long-lasting immobilization;
- recent frequent long-distance flights
- Severe chronic venous insufficiency (varicose veins);
- age above 40 years (the risk increases with the age and is especially elevated at elderly age);
- severe dehydration due to gastroenteritis (not from the dry air in the plane!);
- congestive heart failure

Persons with one, but certainly with a combination of more of these risk factors are recommended to gain medical advice before undertaking a long **journey** (> 3-4 hours).

A study in Lancet (May 2001) shows that **asymptomatic** deep venous thrombosis occurs not unfrequently: it was discovered in 12 % of the travellers who flew for more than 8 hours. Asymptomatic deep venous thrombosis generally disappears spontaneously without consequences.

In the same study, no deep venous thrombosis was reported in travellers wearing support stockings.
For now no scientificly based preventive recommendations can be given to the general public (lack of good studies), except for the general recommendation to stretch the legs regularly during a long-distance flight.

The following is advised (WHO, CDC):

- Wear loose, comfortable clothes;
- Ask for a chair next to the aisle instead of next to the window;
- Keep the leg/foot space underneath the seat of the passenger in front of you empty (no hand luggage) in order to facilitate leg and feet movements;
- Change position regularly and exercise the lower limbs a few times per hour (on board specific instructions are offered by many airplane companies);
- If possible, stand up and walk around regularly (problem: during turbulences);
- Although sufficient intake of (non-alcoholic) beverages during long-distance flights are recommended to avoid dehydratation, the role of it in the prevention of deep venous thrombosis is uncertain. Although the air in the plane may be very dry (saturation of 10-20%), it does not cause deshydratation. Drinking large volumes forces the passenger to stand up regularly (every 2 to 3 hours) to go to the toilet, which may induce a favorable effect.
- CDC as well as WHO formally advise against the use of aspirin as a preventive measure against “travel related thrombosis”.

Persons with **significant to strongly elevated risk of flebothrombosis** need to take **supplementary precautions** in case of long-distance flights:

- Wear specially **adapted support stocking up to the knees**;
- For persons with a very high risk of deep venous thrombosis and other high-risk persons, the only logical medicinal approach is the subcutaneous administration of one preventive dose of a **low-molecular weight heparine** before a long-distance flight (at least 2-6 hours before departure). (This should be kept at room temperature and the subcutaneous injection can be explained from the doctor to the patient). Don't forget to apply the measures during your flight back! Limited studies have shown a favorable effect. These recommendations also apply for long haul bus trips, f.ex. with a night bus.
- **Aspirin** is **not mentioned** here (CDC, WHO). Aspirin has indeed a proven risk reduction of 30% for deep venous thrombosis and possibly 50% for fatal pulmonary embolism in the postoperative period. The advice to start with aspirin a few days before departure, is controversial, because the preventive effect is probably a lot lower than 30% and furthermore there is a risk for side effects which could not be underestimated (potential serious stomach bleedings, especially – but not exclusively – with patients with previously existing erosive gastritis or ulcerations, combination with alcohol, etc.)
- The role of the newer oral anticoagulation medication 'NOACs', who are more and more used, will be clearer in the following years. The intake of 10 mg of Rivaroxaban once or 5 mg of Apixaban in 2 doses with an interval of 12 hours (when travelling more than 24 hours an extra intake will be necessary) is a good alternative for subcutaneous administration of heparins with a low level of molecules (LMWH). It is also cheaper than LMWH, but because there is no reimbursement for the indication of the prevention of 'travelers' thrombosis' it will be more expensive for the patient. Most travelers prefer oral therapy which is more practical than injections during the journey.