Travelers' Thrombosis

Traveler Summary

Key Points

- Travelers' thrombosis begins with blot clots in the leg veins (deep venous thrombosis; DVT) that occur in any setting where a person is immobilized for prolonged periods of time, whether in a car, train, bus, or airplane. A DVT can break loose and travel to the lungs, causing a pulmonary embolus (PE).
- Overall risk is extremely low in those without risk factors, even on long trips; however, important risk factors like underlying cancer or a hereditary clotting abnormality may not be known prior to the first DVT. Other risk factors include travel of 4 or more hours, personal or family history of DVT, obesity, pregnancy, smoking, recent surgery or significant trauma, use of oral contraceptives, and age over 50 years. Nonaisle seats may increase risk due to limitation of movement.
- Symptoms of DVT may be silent or present as a deep pain in one calf or thigh (with swelling). PE may also be silent but symptoms may include sharp chest pain, breathlessness, bloody sputum, and cardiac collapse in some cases. DVT or PE may manifest during or shortly after the flight, but often not for several weeks.
- Prevention includes choosing aisle seating, maintaining hydration, walking frequently, wearing loose clothing, exercising the lower extremities, using a foot rest, and avoiding alcohol and sleeping pills. Graded compression stockings (15-30 mm Hg) that fit properly (not binding at the ankle or knee) can also help. Aspirin has not been proven effective for DVT; persons with clotting disorders or prior history of DVT should discuss options with their health care provider.

Introduction

Deep vein thrombosis (DVT; blood clots in the leg veins) may occur in any situation where there is prolonged pooling of blood in the deep veins of the legs or pelvis, such as in bed-bound persons and those who sit for long periods of time in chairs or on long car, train, or airplane journeys. If a clot or a piece of clot becomes detached from the vein (a process known as venous thromboembolism [VTE]), it can travel to the lungs and cause a pulmonary embolus (PE). A large PE can block a major lung blood vessel and can be fatal; overall, PE occurs in about 0.4 per million airline passengers and is fatal in about 2% of cases. The incidence of VTE is related mostly to personal risk factors, but duration of flight, degree of immobility during the flight, and environmental factors in the cabin can increase risk for those already at risk.

Risk Factors

Whether a clot forms depends on the condition of the walls of the veins, blood flow, and factors that prevent or cause the clotting of blood. Blood flow in the legs may be reduced during long flights or any long trip during which the traveler is sitting for long periods of time. For air travel, the risk of thrombosis increases with the length of the flight. Passengers with cumulative flying times of more than 12 hours within the previous 4 weeks and flying more than 4 hours in 1 flight leg are 2 to 3 times more likely to experience DVT than those who do not fly. DVT, VTE, and PE are extremely uncommon in healthy young adults without personal risk factors. Even in those with risk factors, DVT is uncommon on flights of less than 6 hours.

Inactivity during a flight may be as important as distance flown and is more important than the class of travel; sitting in a window seat versus an aisle seat and sleeping during the flight increases risk.

Personal risk factors for DVTs include (the most important ones are listed first):

- Personal or family history of DVT or PE
- Personal or family history of a known blood clotting disorder predisposing one to thrombosis
- Major surgery, significant trauma, or prolonged immobilization (includes limb casts) in the 6 weeks prior to flight
- Cancer within the last 2 years or currently receiving chemotherapy
- Late pregnancy or the first 6 weeks after childbirth
- Estrogen-containing medication taken for oral contraception, female hormone replacement therapy (HRT), or anti-estrogen therapy (Tamoxifen)
- Age greater than 50 years
- Weight (overweight/obese), height (> 1.9 m [> 6.2 ft] or < 1.6 m [< 5.2 ft])
- Chronic venous insufficiency or large varicose veins
- Chronic inflammatory disease

Additionally, subtle clotting abnormalities are surprisingly frequent in the overall population, and these people may not know they are at risk until they experience a problem after a long flight.

Symptoms

Most episodes of calf thrombosis are asymptomatic. In up to half of persons with DVT, symptoms may include deep pain in the calf or thigh and/or swelling of the lower leg or whole leg, depending on the location and extent of the thrombosis; the leg may become warm or discolored.

PE is also commonly silent or may occur without features of a preceding DVT. Symptoms correlate with severity. Mild episodes present with breathlessness, sharp chest pain on breathing, and, occasionally, bloody sputum after coughing. Severe episodes (massive embolism) present with collapse, severe breathlessness, and central chest pain.

Symptoms of VTE commonly develop during or immediately after a flight, often while still in the airport. One in 3 cases of VTE triggered by flying occurs during the first week after travel, and the remainder occur within 8 weeks after travel.

Need for Medical Assistance

Travelers who develop leg pain, ache, discomfort, swelling, increased warmth, discoloration, joint pain in 1 or both legs, chest pain, shortness of breath, or difficulty breathing within 8 weeks of a flight should seek immediate medical attention.

Prevention

Travelers who are or may be at risk of DVT (e.g., previous DVT, PE, or other risk factors) should consult with their health care provider before making their travel plans. Individuals who are on warfarin-derived blood thinners (e.g., Coumadin) should have their blood-clotting test results checked prior to travel. Persons on newer oral anticoagulant agents (e.g., Pradaxa, Xarelto) should consult with their treating physician if any clotting issues have occurred in the previous months.

Prevention of venous stasis (blood pooling in the legs) is the most important measure to follow in preventing DVTs. Travelers can help decrease their risk of DVT while traveling by observing the following precautions:

- Wear comfortable, loose-fitting clothing that is not tight at the knees (e.g., socks/stockings with strong elastic tops) or waist (e.g., pantyhose).
- Get up and walk around the cabin hourly, if possible; this is easiest from an aisle seat.
- Stand up and periodically stretch arms and legs. Many airlines now provide video presentations on stretching exercises during long flights.
- While seated, exercise leg and calf muscles frequently by flexing and extending the ankles and knees.
- Avoid crossing legs, which may decrease blood circulation.
- Use a footrest when possible to reduce the pressure on the back of the thighs or calves.
- Get up and walk around at transit stops.
- Drink enough water to maintain a flow of pale lemon-yellow colored urine.
- Avoid excess alcohol because it may cause sleepiness.
- Avoid sleeping pills and sedatives.
- Wear graded compression stockings that fit well and exert 15 to 30 mmHg at the ankle level if any personal risk factors exist; ill-fitting stockings may actually increase the risk of VTE.

Moderate intake of alcohol or coffee is not a risk factor for VTE. One glass of water is enough to counter the diuretic effect of 2 units of alcohol (e.g., a double whiskey).

Graduated compression stockings (made of double layer merino wool) significantly increase blood flow in the calves and confer about 90% protection against DVTs on flights of more than 4 hours. At-risk passengers who wear below-the-knee compression stockings on flights of more than 8 hours are 6 to 20 times less likely to develop VTE than at-risk passengers who do not wear stockings.

Aspirin does not provide a protective effect and may cause undesired gastrointestinal side effects.

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