CASE REPORT

Economy Class Syndrome or Immobile Traveler’s Syndrome?

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Economy class syndrome describes the situation of patients who suffer pulmonary embolism following prolonged immobility in a long distance flight. The objective of the present study was to analyze whether there is a risk of pulmonary thromboembolism after a long overland journey. The study consecutively enrolled 100 patients diagnosed with pulmonary thromboembolism. Nine of them had previously undertaken a long journey (>5 h), 6 of which had been over land. Consequently, we think that the preventative measures recommended for airline passengers should be extended to users of other means of transport.

Key words: Deep vein thrombosis. Pulmonary thromboembolism. Traveler’s syndrome. Economy class syndrome.

¿Síndrome de la clase turista o síndrome del viajero inmovilizado?

El síndrome de la clase turista es el que se asocia a personas que presentan una embolia pulmonar a consecuencia de una inmovilización prolongada tras un viaje por vía aérea de larga duración. El objetivo del presente trabajo ha sido analizar si existe riesgo de tromboembolia pulmonar tras un viaje de larga duración por vía terrestre.

Se ha estudiado a 100 pacientes consecutivos diagnosticados de tromboembolia pulmonar. De ellos, 9 presentaban el antecedente de haber realizado un viaje prolongado (> 5 h) y en 6 de estos casos el transporte fue terrestre. Por este motivo pensamos que las medidas preventivas propuestas para los viajeros por vía aérea deben extenderse a quienes utilizan otro medio de transporte.

Palabras clave: Trombosis venosa profunda. Tromboembolia pulmonar. Síndrome del viajero. Síndrome de la clase turista.

Introduction

The first reference to the association between immobility and the risk of deep vein thrombosis (DVT) dates from 1940 when cases of pulmonary embolism were reported in persons who had spent long periods of almost total immobility in subterranean air raid shelters during the bombing raids on London during the Second World War.1 The association between travel and DVT was first reported in 1954 with a description of 5 cases,2 and soon the phrase “economy-class syndrome”3,4 appeared to describe the problems of venous return that occur in passengers on long distance flights in seats with evident restrictions of space and few opportunities to move their lower limbs. Since then, there have been several published case series involving patients who have taken long-distance flights and later developed DVT and/or pulmonary thromboembolism,5-7 but few authors have associated those 2 conditions with overland travel by car, coach, lorry, or train.8,9 We present 9 cases of pulmonary embolism secondary to venous stasis caused by prolonged sitting with little movement during a long journey on one of several means of transport.

Description of Cases

We performed a prospective study of patients with pulmonary embolism secondary to venous stasis during a long journey. Over a period of 2 years, 100 consecutive patients who had been admitted to the pneumology department of the hospital for pulmonary embolism were interviewed in detail about risk factors and journeys undertaken in the days prior to diagnosis. Of the 100 patients, 9 reported having undertaken a prolonged journey with scarce mobility within the previous month. Such a journey was defined as lasting longer than 5 hours in conditions in which the patients’ legs were immobile or had little movement. A patient’s clinical history was examined as well as results of the physical examination, chest x-ray, electrocardiogram, ventilation/perfusion scintigraphy and/or computed tomography angiography, lower limb Doppler ultrasound and contrast venography in cases of doubt or risk of recurrence. Coagulation (prothrombin time and partial thromboplastin time) factors and concentrations of S and C proteins, antithrombin III, lupus anticoagulant, and D-dimer were...
Results

Seven patients suffered from complications related to long journeys. In 100 patients who had undertaken a long journey prior to presenting pulmonary embolism, 37 (75%) fulfilling the criteria were included in the present study. The mean age was 67.8 years (range, 26-89). Pulmonary embolism was suspected on first diagnosis in 9 patients. Five patients presented thrombophilia. In all cases, the D-dimer dosage administered in the emergency department was greater than 552 ng/mL. Ventilation/perfusion scintigraphy was performed on all patients 1, 3, and 6 months after admission until results were normal or anticoagulant treatment had terminated.

Statistical Analysis

Descriptive statistics (percentages, means, and ranges) were compiled for the episodes.

Discussion

The results of these studies have led to the debate over the association between travel and the condition and epidemiological studies do not manage to find a clear indication that long journeys are a major risk factor. Nevertheless, in March 2001 the World Health Organization accepted that there was a probable risk of presenting pulmonary embolism after prolonged flights despite the low incidence and the presence of other risk factors in most of the passengers affected.

Several studies have tried to use theoretical explanations to defend the hypothesis that long-distance journeys increase the risk. However, the real risk has been poorly quantified, given the diverse diagnoses and particularly the absence of a demonstrated cause-effect relationship. The case-control studies available report contradictory results. Ferran et al. found that traveling was a risk factor for DVT and pulmonary embolism, Kraaijkenhagen et al. found that traveling was associated with multiple risk factors, and Ten Wolde et al. found no association.

Neither has it been established whether risk is associated with air travel alone or, as seen in our study, with several means of transport. For example, some authors find no differences between the risk associated

<table>
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<tr>
<th>Patient</th>
<th>Sex</th>
<th>Age, and</th>
<th>Length of Journey, h</th>
<th>Latency Time, h</th>
<th>Means of Transport</th>
<th>Risk Factors</th>
<th>PE Extension</th>
<th>D-Dimer, ng/mL</th>
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<tr>
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<td>14</td>
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<td>24</td>
<td>Coach</td>
<td>Age, DVT</td>
<td>Extensive, bilateral</td>
<td>&gt;1000 200</td>
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PE indicates pulmonary embolism; M, man; W, woman; DVT, deep vein thrombosis.
with different types of vehicles—airplane, coach, train, or car—while others only identify the risk associated with air transport. We do not have, then, any conclusive study on this syndrome and there is epidemiological uncertainty over its existence. Prolonged sitting during travel probably induces venous stasis, evidence of which would be the presence of lower extremity edema.

Should primary prevention be recommended to overland travelers as well as airline passengers? Given the uncertainty it seems reasonable to recommend some safe, simple measures based on common-sense and aimed at preventing venous stasis in travelers on journeys more than 5 hours long. These recommendations should include avoiding sitting with crossed legs, standing up and walking for 2 minutes every 2 hours, and performing flexion and extension exercises with the feet while seated. Appropriate hydration, avoidance of excessive alcohol intake, and wearing loose clothes that do not constrict the waist or legs are also recommended. Passengers with known risk, such as a history of DVT or pulmonary embolism, chronic venous insufficiency, recent surgery, chronic heart or respiratory disease, cancer, and thrombophilia, as well as persons who are elderly, pregnant, overweight, or taking oral contraceptive drugs should take particular care on journeys of more than 5 hours. The use of elastic support tights and prophylaxis with low-molecular-weight heparin have also been recommended.

We would like to emphasize that elderly people in Spain frequently undertake long journeys by coach or car where mobility is restricted so the risk of DVT and pulmonary embolism probably increases some hours or days after the journey. The preventative measures given to passengers of intercontinental flights, then, should be extended to these travelers using overland transport.

REFERENCES