Airborne collapse: an in-flight emergency

Michael Moore, Peter White and Pamela Royle

Introduction

THE following events occurred midway across the Atlantic Ocean while two of the authors were returning from a north American conference. We responded to a call for medical assistance. The final diagnosis is not known, as the airline declined to provide details on the grounds of confidentiality, a difficulty which is recognised to inhibit research into airborne emergencies.[1]

Case history

The passenger, a 65-year-old woman who had previously been well, had called for help because she had indigestion and nausea. She had then became unrousable and had been sweating profusely for 5 minutes. By the time of our assessment she was semi-conscious and clammy. She denied any chest pain, but felt unwell and light-headed. Her pulse was regular and barely palpable, with a rate of 68 beats per minute, and her respiration was unlaboured. After a brief consultation a small medical pack was obtained and a physical examination undertaken in the half-light in the narrow gap between the seats. Her systolic blood pressure was 60 mmHg by palpation, pulses in both arms were palpable, there was no abdominal mass or tenderness, and there were no other gross physical signs, bearing in mind the conditions and background noise.

We conferred, and a cardiac event seemed possible; there were no signs to suggest aortic dissection or leaking aneurysm, but a pulmonary embolism could not be ruled out. The profound hypotension without reflex tachycardia meant that volume depletion was unlikely and the symptoms seemed too profound and prolonged for a simple vasovagal episode. We gave her aspirin 300 mg and considered the possibilities.

If this was indeed a coronary event she was at risk of a potentially fatal dysrhythmia and would benefit from thrombolytics. We asked ourselves how urgently should this be administered. Forty minutes after the first collapse, and 25 minutes after our initial evaluation, her pulse was stronger and the systolic blood pressure 90 mmHg. She felt a little better and did not want any fuss made.

M Moore, MRCP, FRCGP, general practitioner, Three Swans Surgery, Salisbury, Wiltshire. P White, FRCGP, general practitioner, Nightingale Surgery, Romsey. P Royle, PhD; MSc; Grad Dip Info Serv, senior research fellow, Department of Public Health, University of Aberdeen.

Address for correspondence

Dr Michael Moore, Three Swans Surgery, Rollestone Street, Salisbury, Wiltshire SP1 1DX. E-mail: research.3swans@virgin.net.

Submitted: 20 February 2003; Editor's response: 30 May 2003: final acceptance: 26 November 2003.

We were ushered to the flight deck for a conference with the captain. By then we were 2 hours from Heathrow Airport. Dublin was nearer but would only cut 20 to 30 minutes off the journey. The airline had no ground staff at Dublin, posing problems for landing, and there was some uncertainty about how rapidly a transfer to hospital could be made. A link with the airline physician was established and the history and risks outlined. The decision was made to continue to Heathrow, where an ambulance was waiting to enable immediate transfer to hospital.

Discussion

It is well recognised that myocardial infarction can occur in the absence of chest pain. Between 8% and 30% of patients with subsequent proven myocardial infarction may present without chest pain. Painless presentation is more likely with increasing age, female sex, and a prior history of diabetes or heart failure, and it is less likely with a history of prior angina.[2,3] It is therefore feasible that our patient had indeed suffered acute myocardial ischaemia. Early treatment with thrombolytic agents is beneficial if administered within 12 hours of onset of pain. For each hour of delay the absolute risk reduction (ARR) for death is reduced by 0.16% (ARR for death if given within 6 hours = 3%: if given 7 to 12 hours from onset = 2%).[4] If continuing to Heathrow contributed an extra 30-minute delay, then the loss of ARR of 0.08% would apply, giving a number needed to divert of 125 jumbo jets to prevent one death. Clearly, the economic consequences of such a decision are considerable, and it should also be considered that diversion may have adverse health consequences for other passengers. If the time savings were greater, or the diagnosis more certain, then a different conclusion might have been appropriate.

Another alternative to be considered is the use of in-flight thrombolysis. The safety and effectiveness of thombolytics administered in the community is established.[5] For diagnostic precision an ECG would be helpful. Acute myocardial infarction is unlikely in the absence of ECG changes: only 6% of patients presenting in a large hospital series, with typical features but negative ECG, subsequently had an infarction confirmed,[6] while omission of the ECG is likely to result in more than half the treatments being unnecessary.[7] However, new developments mean that an in-flight ECG with interpretation by physicians based on the ground may soon be available and this may increase the feasibility of in-flight thrombolysis.[8] Automated defibrillators have been successfully used by a United States airline.[9]

Airborne emergencies are not uncommon, but estimates of their true frequency vary widely, and medical incidents occur as frequently as 1 in 11 000 passengers.[8] Cardiac problems are both the commonest complaint (10% to 20%) and the most frequent cause of medical diversion (28% to 46%).[1,8,10] As travellers get older and planes larger, frequent travellers might like to reflect that they may be asked to attend an emergency at least once every 30 flights.[10]

References

1. Goodwin T. In-flight medical emergencies: an overview. *BMJ* 2000; **321:** 1338-1341.
2. Madias JE, Chintalapaly G, Choudry M, *et al*. Correlates and in-hospital outcome of painless presentation of acute myocardial infarction: a prospective study of a consecutive series of patients admitted to the coronary care unit. *J Investig Med* 1995; **43:** 567-574.
3. Canto JG, Shlipak MG, Rogers WJ, *et al*. Prevalence, clinical characteristics, and mortality among patients with myocardial infarction presenting without chest pain. *JAMA* 2000; **283:** 3223-3229.
4. Mehta S. Acute myocardial infarction. *Clin Evid* 2001; **5:** 9.
5. GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis by general practitioners: Grampian region early anistreplase trial. *BMJ* 1992; **305:** 548-553.
6. Karlson BW, Herlitz J, Pettersson P, *et al*. Patients admitted to the emergency room with symptoms indicative of acute myocardial infarction. *J Intern Med* 1991; **230:** 251-258.
7. Bouten MJ, Simoons ML. Strategies for pre-hospital thrombolysis: an overview. *Eur Heart J* 1991; **12 Suppl:** G39-G42.
8. Dowdall N. 'Is there a doctor on the aircraft?' Top 10 in-flight medical emergencies. *BMJ* 2000; **321:** 1336-1337.
9. Page RL, Joglar JA, Kowal RC, *et al*. Use of automated external defibrillators by a US airline. *N Engl J Med* 2000; **343:** 1210-1216.
10. Gendrau MA, de John C. Responding to medical events during commercial airline flights. *N Engl J Med* 2002; **346:** 1067-1073.

Consent

Owing to the circumstances of this case we have been unable to obtain consent from the patient prior to publication. In order to protect their confidentiality some personal details have been altered.