

Nonurgent Commercial Air Travel After Acute Coronary Syndrome: A Review of 288 Patient Events

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Abstract

Objectives: We studied a population of individuals who experienced an acute coronary syndrome (ACS) event while traveling abroad and required nonurgent commercial air travel to the home region.

Methods: This retrospective study gathered data from 288 patients enrolled in a travel-based medical assistance program. Interventions, complications, and travel home were assessed for trends. Descriptive and comparison statistical analyses were performed.

Results: Two hundred eighty-eight patients were identified and entered into the review. Of the patients in this study, 77.1% were male with an average age of 67.7 years. One hundred sixteen (40.3%) patients were diagnosed with unstable angina pectoris (USAP), whereas the remaining 172 (59.7%) patients experienced acute myocardial infarction (AMI). Regarding inpatient complications during the initial admission, 121 (42.0%) patients experienced 1 or more adverse event. The average number of days after an ACS event that a patient began to travel home was 10.5 days for the entire patient population (USAP patients = 8.8 days, AMI patients = 11.8 days). Two hundred twenty (76.4%) patients traveled with a medical escort, and 48 (16.7%) patients received supplemental oxygen during air travel. Four (1.4%) in-flight adverse

events occurred in the following ACS diagnostic groups: 2 in the complicated AMI group, 1 in the uncomplicated USAP group, and 1 in the uncomplicated AMI group. No in-flight deaths occurred. Nine (3.1%) deaths were noted within 2 weeks after returning to the home region. The deaths after returning to the home region occurred in the following ACS diagnostic groups: 2 in the complicated USAP group, 1 in the uncomplicated USAP group, and 6 in the complicated AMI group. None of the patients who experienced in-flight events died after returning to their home region.

Conclusions: Upon discharge, the vast majority of ACS patients who travel to their home region via commercial air do not experience adverse events in-flight; when such adverse events occur in-flight, these events do not result in a poor outcome. No in-flight deaths occurred; death occurred in a minority of patients after returning to their home region, particularly in the complicated USAP and AMI groups, who were planned readmissions to the hospital.

Introduction

There exist a variety of guidelines addressing nonurgent, commercial air travel for patients who have experienced an acute coronary syndrome (ACS) event while traveling. These guidelines, which include recommendations for the time interval after the ACS event to initiate travel home, have been proposed by a number of different agencies with interest and experience in cardiovascular ailments and air travel, including the American College of Cardiology, American Heart Association, Aerospace Medical Association, Aviation Health Unit, British Cardiovascular Society, and Canadian Cardiovascular Society.¹⁻⁶ These recommendations vary greatly with respect to time interval to travel after an ACS event; furthermore, guidelines for medical escort and various in-flight therapies (ie, supplemental oxygen) also differ from 1 recommending agency to another. In both instances (ie, time to travel and in-flight medical management), recommendations are not evidence based. In fact, previous literature reviews have noted the guidelines are ambiguous and based on extremely limited data, using prudent medical thought as the evidence.^{6,7} A summary⁶ of the existing evidence has recently been published, highlighting both the diversity of opinion-based recommendation and the lack of objective science supporting the guidelines (Table 1).

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Table 1. Summary of Current Guidelines

Descriptor	ACC/AHA (2004/2007)	AsMA (2003)	CCS (2003)	Aviation Health Unit, UK Civil Aviation Authority (2007)	BCS (2010)
Following AMI, uncomplicated	< 2 wk after UA/NSTEMI > 2 wk after STEMI	2-3 weeks	6-8 weeks or Normal stress test & Bruce protocol > 6 metabolic units	7-10 days	3 days
After AMI, complicated	2 weeks & stable	6 weeks	Address & stabilize complications (escorted if requires readmission)	4-6 weeks	10 days; defined as medium risk with no symptoms of heart failure, EF > 40%, no evidence of inducible ischemia or arrhythmia
After AMI, CABG revascularization	N/A	2 weeks	NA	10-14 days	Without complications, 10 days
After MI, PCI revascularization	< 2 weeks in low risk category	NA	NA	5 days after angioplasty with stent placement	Within 3 days without complications
Other contraindications	Angina Dyspnea Hypoxemia at rest Fear of flying Flying alone No nitroglycerin No use of airport assistance	UA Severe heart failure Uncontrolled hypertension Uncontrolled arrhythmia Eisenmenger syndrome	Bruce protocol < 6 metabolic units	UA Decompensated heart failure Uncontrolled cardiac arrhythmia Severe symptomatic valvular heart disease	Acute heart failure, fly after 6 weeks if stabilized

ACC = American College of Cardiology; AHA = American Heart Association; AsMA = Aerospace Medical Association; AHU = Aviation Health Unit; BCS = British Cardiovascular Society; CABG = coronary artery bypass graft; CCS = Canadian Cardiovascular Society; EF = ejection fraction; MI = myocardial infarction; NA = not applicable; NSTEMI = non-ST elevation myocardial infarction; PCI = percutaneous coronary intervention; STEMI = ST elevation myocardial infarction; UA = unstable angina.
Adapted with permission.⁶

A variety of concerns exist for ACS patients traveling nonurgently via commercial aircraft, including altitude-related hypoxia, travel-related anxiety, and extremely limited access to medical care while in-flight. Concerns for the potentially hypoxic and stressful aircraft environment have been voiced for a number of years. With the partial pressure of atmospheric oxygen decreasing from 150 mm Hg to 107 mm Hg at 8,000 feet (standard cabin pressure in pressurized commercial aircraft) regardless of the actual altitude reached for travel, arterial blood oxygen saturation decreases.⁸ Healthy individuals are able to compensate for this decrease through increased cardiac output; however, individuals who have experienced a recent ACS event with related compromised physiologic reserve may not be able to compensate effectively.

In addition to the potentially hypoxic environment, the anxiety of flight may also contribute to complications in patients. The medical literature suggests that patients in rotary and

fixed-wing aircraft experience increased anxiety states, in addition to elevated serum catecholamine levels compared with nonair travel scenarios;^{9,10} similar data do not exist for commercial aircraft with pressurized cabins, although prudent opinion suggests that heightened anxiety is also found in this traveling patient group. A recent literature review on nonurgent commercial air travel after acute myocardial infarction (AMI) notes that additional stresses may include heightened airport security, flight delays, and preflight activities that lead to overexertion including carrying heavy baggage or walking long distances to gates;⁶ however, it is unknown if these physiologic, physical, and psychological stressors equate with increased cardiovascular risk. Conversely, a current expert states that the pressurized aircraft cabin environment does not pose a significant threat to noncritically ill patients with cardiovascular disease;⁷ noncritically ill translates into no current nor recent physiologic stressor or condition, such as recent acute coronary syndrome.

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