

**IN-FLIGHT MEDICAL EMERGENCY: AN EXPERIENCE WITH SINGAPORE AIRLINES**

Dear Sir,

As a fellow doctor, I would like to draw your attention to a critical issue regarding a medical emergency encountered during an air flight, with reference to my personal experience in treating a passenger while I was flying with Singapore Airlines on January 12, 2008. The purpose of this letter is to highlight the strength of the in-flight medical emergency system and some points for discussion.

In-flight medical emergencies are becoming a concern for airlines and their passengers in light of the increasing number of air passengers. It has been reported that close to two billion people travel on commercial airlines each year.<sup>(1)</sup> The incidences of significant in-flight emergencies are approximately one per 10,000 passengers to one per 40,000 passengers, with one death occurring per three to five million passengers.<sup>(2)</sup>

The SQ flight was from Sydney, Australia to Singapore. The whole journey took about eight hours. Three hours into the flight, a 58-year-old woman began complaining of central chest pain radiating to her left arm, shortness of breath and a dull aching pain in her right lower limb. She described the chest pain as having started like a heavy stone sitting on her chest. After giving the passenger an oxygen supplement, the flight attendant immediately summoned help from other crew members and the captain, who paged for medical assistance on board. A registered nurse and I went to see the patient.

Her chest pain and right lower limb pain were persistent while she was receiving the oxygen supplement. Her medical conditions included hypertension, obesity and a left mastectomy due to breast cancer many years ago. She denied diabetes mellitus, heart disease, smoking and lung diseases. On examination, she was afebrile, tachycardic (111 beats per minute), hypertensive (140/70 mmHg), and hypoxic (her oxygen saturation obtained from a pulse oximeter was 88% on air and 99% on 15 L/min oxygen supplement via a non-rebreather mask). She complained that the mask made it difficult for her to breathe and attempted to remove it. A few minutes after removing the mask, her oxygen level dropped to 88%–90%. We persuaded her to keep the oxygen supplement through the mask. When her oxygen saturation level maintained at about 100%, the oxygen flow-rate was reduced to 5 L/min and her oxygen saturation was maintained at about 96%–99%. Her lungs were clear to auscultation, the abdomen was soft and non-tender and her heart sound was dual without a murmur. However, she had moderate pitting oedema on her right ankle and mild right calf tenderness on palpation. The provisional diagnoses included angina, myocardial infarction and pulmonary embolism.

The patient was transferred from the economy class to a business class seat so that more space would be available for cardiac pulmonary resuscitation in case of cardiac arrest. Telecommunication with the medical team at the Singapore Changi Airport was established. The patient was given a tablet (600 mcg) of glyceryl trinitrate (GTN) sublingually and 300 mg of aspirin orally. She was stabilised clinically, i.e. her chest pain and shortness of breath eased. Her vital signs were stable (heart rate was regular at 90–95 beats per minute, blood pressure was 130/60 mmHg, her oxygen saturation was 96%–99% on 5 L/min of oxygen supplement). The medical team was on standby for the patient once the airplane landed. The patient was handed over to the medical team to carry out further investigations in order to rule out myocardial infarction and pulmonary embolism.

The strengths of the Singapore Airlines in-flight medical emergency system include:

- The ability of the flight attendant to recognise a sick passenger and call for help immediately.
- The facility for telecommunication between the medical team at the Singapore Changi Airport and the “treating team” on board.
- Availability of a well-equipped first-aid kit on board.
- A medical-emergency-call-log system to keep track of the medical event.
- A prompt response from the medical team once the airplane landed.
- The excellent teamwork of the cabin crew.

The following are some points for discussion:

- Electrocardiography (ECG) equipment should be made available. In case of a situation where there is no medical doctor or trained personnel to interpret an ECG on board, the ECG should be able to be transmitted

to ground-based doctors, who are either in Singapore or a host country to which the plane will be diverted, for interpretation and advice on the necessary action. The doctors should be capable of interpreting the ECG and advising management, bearing in mind the availability of facilities and medications on board which may vary between airlines. The capability of the air crew to follow the management advice will be enhanced with well-labelled equipment and medications, as well as clear instructions on how to use them. Nonetheless, it is a challenge for many airlines to install an advanced telemetry system that transmits video images, vital signs, 12-lead ECG and oxygen-saturation data to ground-based doctors.<sup>(3)</sup> According to Gendreau and DeJohn, only one airline (i.e. Virgin Atlantic) has installed such systems on board its aircraft.<sup>(1)</sup>

- There may be controversies in managing a patient who has chronic airway disease with a high-flow oxygen supplement, as the patient may have a high risk of retaining carbon dioxide. On the other hand, hypoxaemia is immediately life-threatening and is very often seen in ischaemic conditions due to a probable myocardial event. It would be prudent to ensure a good flow of oxygen to ensure the adequacy of cellular oxygen for metabolism. At the present time, commercial aircraft cabins are required to be pressurised to the equivalent of 8,000 feet (2,438 m) or less. Some patients with pulmonary disease may experience significant physiological stress, exacerbation of their underlying illness and severe hypoxaemia during air travel.<sup>(4)</sup>
- A review of the medical-emergency-call-log database will be useful to consolidate the findings of the frequency of emergency situations occurring during air flights so that adequate facilities and protocols can be upgraded accordingly.<sup>(5)</sup> A recent review by Urwin et al suggests collaboration between aviation providers to develop a common database of in-flight emergencies so that the contents of medical kits can be standardised in order to improve the quality of care in the air.<sup>(6)</sup>
- Medical personnel who offer help on board should be aware of the limited “good Samaritan” protection. He must render medical care similar to the care that others with similar training would provide under such circumstances. A recent review by Tonks states that industry experts say the risk of litigation is close to zero as long as the assisting passenger is working with the crew member as part of a team with shared responsibility for what happens.<sup>(7)</sup>

In short, Singapore Airlines has demonstrated an efficient system in managing a medical emergency during this air flight.

Yours sincerely,

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