

The Semi-Automatic Defibrillator In Airliners: Interest and Contribution

Fahd Bennani Smires*, Zakaria Iloughman¹, Mouna Elghazi¹, Houda Echchachoui¹, Meryem zerrick¹, and Mohamed Chems¹

¹Aeromedical expertise center of the Military Hospital Mohamed 5, Rabat, Morocco

*Corresponding author:

Fahd Bennani Smires

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Abstracts: Each year many lives are lost due to cardiac arrest in the special environment of an airplane cabin. Early defibrillation is the most important point in survival after cardiac arrest secondary to ventricular fibrillation. In addition to the emergency medical kit, the semi-automatic defibrillator is becoming necessary equipment on commercial long-haul aircraft. Proper use of this equipment requires good crew training and the integration of defibrillation into the survival chain and it is part of aeromedical assistance.

Keywords: Semi-automatic defibrillator (SAD), Ventricular fibrillation, Airliners, Survival chain.

INTRODUCTION:

In addition to the emergency medical kit, semi-automatic defibrillation is becoming standard equipment on commercial aircraft for first aid in the event of sudden death. Proper use of this equipment requires good crew training and the integration of defibrillation into the survival chain and is part of aeromedical assistance (Page, R. L. et al 2000).

HISTORY:

The integration of a semi-automatic defibrillator (SAD) into the emergency rescue equipment of commercial airliners was a decision taken by the international medical and aeronautical community to give a chance to survive after a sudden death in flight. After old aeronautical initiatives (British Caledonian Airways in 1987, Virgin Atlantic Airways in 1990 and Qantas in 1991), it was necessary to await the technological evolutions of the SAD and the implantation of semi-automatic defibrillation "on the ground" in the chain of care of different health systems. Following a resolution from the United States Senate, the Federal Aviation Authority (FAA) established rules to establish a SAD by April 2004 for all domestic and

intercontinental US flights. In Britain, the House of Lords has issued similar recommendations for long-haul flights. The majority of airlines have followed this globalization of DSA in air transport (Lyznicki, J. M. *et al.*, 2000). The SAD thus complements the first aid kit, oxygen and the medical kit already available on board.

Causes Of Sad Necessity In Air Transport:

Although sudden death is exceptional in airplanes, estimated between 0.3 to 1 per million passengers, several data justify now having a SAD in air transport:

- We are witnessing, worldwide, a considerable increase the number of air travelers (+ 5% per year) and an increase in the age of the population transported. These facts, in addition to the development of very high capacity aircraft and the extension of non-stop flight times, have resulted in an increase in in-flight medical incidents and accidents. Cardiac and coronary pathology is the first cause in serious accidents; it is true that, for some passengers, the journey to the airport, waiting times, prolonged standing, boarding, then altitude

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travel and jet lag represent a "stress test" (Jagoda, A., & Pietrzak, M. 1997).

- The effectiveness of SAD is based on evidence widely documented in the international literature: recommendations for the management of non-traumatic cardiac arrest give the first gestures of cardiopulmonary resuscitation (CPR) and early defibrillation a prognostic role determinant (Baskett, P. et al., 2000). In the absence of defibrillation, the chances of survival from cardiac arrest by ventricular fibrillation (VF) decrease by 10% every minute (JOST, D. et al., 2003).
- In the event of a sudden passenger death on an airplane in flight, the diversion and emergency landing are illusory since they require 20 to 30 minutes at best. It is therefore on board that the material resources necessary for the rescue operations implemented by the crew must be found (Kacet, S. et al., 2002).

Solicitations Of Sad On Board An Airplane :

The SAD in an airplane is not enough by itself:

- The initial training of flight personnel in both basic cardiopulmonary resuscitation and the use of DSA is fundamental. In France, to be eligible for the employment of the DSA, cabin crew must hold a training certificate in first aid activities and must then have validated theoretical and practical training specific to DSA (Décret 98-239 du 27.03.1998; & Arrêté du 4.02.1999).
- The DSA is the third link in the survival chain and cannot be dissociated from the other links (1 = Alert, 2 = Basic cardiopulmonary resuscitation, 3 = DSA, 4 = Specialized cardiopulmonary resuscitation). If defibrillation is essential to treat ventricular fibrillation, it does not treat the cause and the risk of recurrence is high (White, R. D., & Russell, J. K. 2002).

CONCLUSION:

The very low probability of real use of the SAD in flight raises two real problems: on the one hand: the continuous training of personnel in CPR and SAD which must be just as essential as initial training, and on the other hand: medico-economically, it seems difficult to seek the profitability of the installation of a SAD in an airplane: should it be done, as it is true that

nobody would think of questioning the presence aboard equally exceptional fire extinguishers?

Competing Interests:

The authors declare that they have no competing interests.

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