

Opportunities in air retrieval of the critically ill in the background of economics and geopolitics of Sri Lanka

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To the Editor

We write to inform our medical colleagues of the opportunities for air retrieval of critically ill patients, including ECMO patients, in our country. More awareness of the potential for improved patient outcomes and the economic benefits of air retrieval in the background of the geopolitics of Sri Lanka, will lead to better outcomes in both air retrieval and critical care.

Air retrieval is defined as the organized process of transferring a patient from one location to another, most commonly to a hospital, under medical supervision by air, using a fixed wing aircraft or a rotor wing helicopter. There are three types of medical retrieval:

Casevac – Evacuation of a casualty from the point of injury (POI) to the closest appropriate medical treatment facility utilizing the most effective means of transportation. It is an unregulated movement of casualties.

Medevac – The evacuation of patients to a higher-level medical facility from the POI. It is temporarily equipped and staffed with medical attendants for en-route care. There are three main types of Medevacs: land, sea and air Medevacs.

Aeromedical Evacuation (AE) – A fixed-wing aircraft or a helicopter is used as an air ambulance that can supply en-route medical care. The movement of patients is strictly done under

medical supervision between medical treatment facilities by air transportation.

In an AE, the medical crew and the aircraft is equipped with a ventilator, in-flight vital sign monitors and an automated external defibrillators (AED), infusion, syringes and suction pumps with drug libraries and air worthy oxygen cylinders. More advanced AE capable aircrafts can incorporate incubators, inflight ultrasonography, ECMO, and blood gas analyzers.

In Sri Lanka, Bell 412 (rotor wing) (fig 1) and Y-12 (fixed wing) are used as AE aircrafts.



Fig 1 : Casevac using the Bell 412 during the war in Sri Lanka

During the long-standing war in Sri Lanka, the Sri Lankan Air force (SLAF) performed many Casevac flights, scooping injured soldiers from the war zone to medical care facilities (fig 1). Medevacs were

common during these times and were performed by both fixed wing and rotor wing aircrafts. However, AEs were less common during this period due to the scarcity of the relevant facilities and equipment.

The SLAF is responsible for the medical treatment and general care of all patients carried in SLAF aircrafts. It commences from the time of their being received for AE by the authorities and ends when they leave to the nearest medical unit or civil medical authority. Patients may be carried in transport aircrafts accompanied by medical personnel depending on the condition of the patient. There are special aircrafts equipped and manned for carriage of patients. Currently, SLAF has the Spectrum Aeromed (2800 Series) Medevac Kit (fig. 2). It has been used for AE of critically ill patients from the periphery of the country to the National Hospital of Sri Lanka, Colombo.



Fig 2 : Spectrum Aeromed 2800 Series Medevac Kit at SLAF Base Ratmalana

The Indian Ocean Region (IOR) is an area stretching from the Strait of Malacca (between the Indonesian island of Sumatra and Malaysia) and the western coast of Australia in the East to the Mozambique Channel in the West. It roughly covers an area of 68.6 million sq.km and is the third largest ocean area in the world, spanning over nearly 17.5% of the earth's surface, with 35% of the world's population, residing in 28 sovereign states, in three continents (fig. 3). Note the geo-strategic position of Sri Lanka in contiguity to the colossal mainland Asia along the global sea line of communication situated strategically at the midpoint between the East and West.



Fig 3: The Indian Ocean Region (IOR)

Covering the area from resource-rich Africa, through the energy-dense Middle East, to South and East Asia's labor markets and manufacturing industries, the stability of the IOR is crucial to the global economy. The IOR lies at the crossroads for 75% of global maritime trade and around 50% of the air traffic. Furthermore, it houses 40% of offshore oil production worldwide and 50% of global oil transport. The region facilitates three major sea lines of communication (fig. 4) and accounts for 15% of the global fishery.



Fig 4 : Global sea routes

It is an area of a large refugee outflux and there are cartels, those who engaged in human trafficking in large scales, where observations, tracking and rescue operations needs to be coordinated and executed with the support of airborne assets. Furthermore, as a maritime nation located in extreme close proximity to global sea lines, we are on-call for maritime disasters with the Sri Lanka Navy, Coast guard.

The Sri Lankan maritime jurisdiction is much larger than the land mass. The Exclusive Economic Zone

extends 200 Nautical miles (NM) from the coast (fig 5).

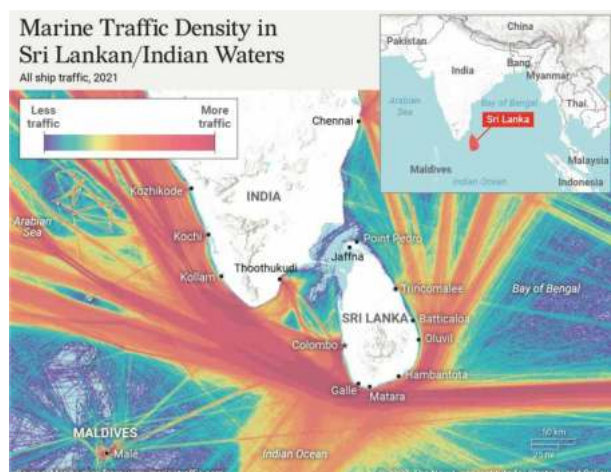


Fig 5 : Geo strategic position of Sri Lanka

With regards to security, the Air Defense Identification Zone (ADIZ) is demarcated at 12NM into sea from the coastline (fig. 6).



Fig 6 : Air Defense Identification Zone (ADIZ) of Sri Lanka

The air traffic services, the Colombo Flight Information Region (FIR) lies above the Indian Ocean along with the Search and Rescue region, which amounts to around 900,000 Sq Km, boarding Chennai, Male, Melbourne and Jakarta FIRs, giving a significant area of responsibility.

In this background, there are many opportunities for the development of AE services using the advantage of the geo-location of Sri Lanka. Potential areas for development in the field that merits discussion are:

1. Enhanced infrastructure

The requirement of fixed wing and rotor wing aircrafts compatible with medevac kits should be

fulfilled. These aircrafts must be with increased speed, efficacy, range and accessibility as they should be able to perform sea/ ship evacuations. The purchase of medevac kits and finding servicing agent companies should be initiated. Improvements of airstrips and helipads should be done for safe and smooth landing in relevant areas. A plan to uplift the healthcare facilities in Medevac targeted hospital should be implemented and it must match the international standards.

2. Technological advancements

Advanced medical equipment are needed to provide a better service. These must be for ground as well as air medical purposes. The equipment that are used for air medical evacuation should be air-worthy. The inflight care can be enhanced by adding telemedicine which can be extended with real time monitoring by on-ground medical specialists.

3. Customizations

The aircrafts must be adapted and customized to the patients' needs. More advanced settings include the transport of patients on dialysis and ECMO, and paediatric/ neonatal transfers.

4. Training of medical and aviation personnel

Continuous training of aviation medical personnel is essential and can be achieved by frequent training programs, demonstrations, simulations and hands-on skills. Similar training should be given to the on-ground medical personnel in AE to understand the differences in air transport as compared with ground transport.

5. Support from the Ministry of Health, Navy and other organizations

A steering group consisting of the military (enhancing maritime capability, integration with SLAF Air retrieval capability), Ministry of Health and other government sectors and civilian entities, including the private sector, should pave the way forward in the future of air retrieval in Sri Lanka. Developing better standard operating procedures (SOP), policies and regulation on AEs

is a must which will help to deliver a better service to the clients. Seeking support from private entities will improve the financial base and make this a potentially profitable industry. These concepts need multidisciplinary support.

Good civil-military collaboration, especially with the health sector and the SLAF will expand these services as both entities are first responders in disaster situations. The responsible entities should develop links and cooperation with regional and international bodies to obtain these requirements and to share their experiences.

Globally, AE is a vast industry which generates a huge income. In Sri Lanka, commercial AE is not developed due to lack of infrastructure. Sri Lanka, being in a strategic and critical location in the IOR, could accommodate regional air retrievals in collaboration with nearby countries and hospitals. As a popular tourist destination, the air retrieval industry can also cater for tourists. This will provide better service and generate more income. Collectively, these will enhance the quality, effectiveness and efficacy of AE, improving the standard of care for all patients, particularly the critically ill.

Further reading

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