Air Medical Retrieval of Acute Psychiatric Patients

Lee Soomaroo, MBChB, MCEM, Jodie A. Mills, CCRN, RM, MSc, and Mark A. Ross, MBBS, FACEM

Abstract

Background: The aim of this study is to review the characteristics of acute psychiatric patients requiring air medical retrieval across the Northern Territory (NT) of Australia, to assess the sedation requirements and incidence of in-flight complications when retrieving such patients, and to review the optimal flight crew composition required for safe retrieval.

Methods: Retrospective data were collected for all psychiatric patients retrieved by an air medical retrieval service of the NT of Australia over a 12-month period between February 1, 2012, and January 31, 2013.

Results: Two hundred sixty-two patients were retrieved using fixed wing transport; 90% were indigenous. Eighty-one percent of retrievals occurred during the day, averaging approximately 4.5 hours. A flight doctor was tasked with a nurse to retrieve 79% of patients. Eighty-nine percent of patients received sedation in the health care center before flight, whereas 39% of total patients required further in-flight sedation. Only 8 patients required intubation before transport. The only in-flight complication was hypotension occurring in 6% of patients; these cases predominantly involved the use of propofol, and the hypotension was rapidly corrected without further incident.

Conclusions: This review highlights the characteristics of psychiatric patients retrieved by an air medical retrieval service in the NT of Australia. The majority of patients retrieved had a background psychiatric history and also a history of violence. Given the nature of the retrieval and the risk to crew and aircraft, a flight doctor was tasked on a high number of cases. The complication rate was negligible. Further analysis of patient history and characteristics of violence could lead to a risk assessment tool for the retrieval of such patients.

Introduction

In 2011 to 2012, there were 3.0 million Australians (13.6%) who reported having a mental health condition, an increase from 11.2% in 2007 to 2008 and 9.6% in 2001.[1] Indigenous mental health is particularly poor, with hospitalization for mental and psychotic disorders being twice as high as the nonindigenous population. Suicide rates for 12- to 24-year olds were more than 4 times as high among Aboriginal and Torres Strait Islanders compared with nonindigenous young people.[2] The high use of psychoactive substances coupled with poor general practitioner and mental health clinic attendance makes treatment of mental disorders within this population particularly difficult.

Most medical care for the region is provided by smaller remote community clinics staffed by remote area nurses and general practitioners. Facilities to deal with patients presenting with mental health disturbances, which may require 1-to-1 supervision and potential sedation and restraint, are limited and can place a great burden on staff and community resources; hence, the assistance of air medical retrieval (AMR) services are often required.

There is 1 air medical service solely responsible for the transfer of high-acuity patients throughout the Top End of the Northern Territory (NT), providing flight medical and nursing expertise for high-acuity cases covering a vast area from Elliot in the south extending from the border of Western Australia to the Queensland border in the east (Fig. 1). After assessment by clinic staff, patients requiring further mental health assessment are transferred to the receiving psychiatric unit in the NT.

AMR of patients with acute mental disturbance presents several challenges to the retrieval team. Transportation is particularly hazardous because of the risks the patients present to themselves, the flight crew, and the aircraft. The aim of this study is to review the characteristics of psychiatric patients requiring AMR in the NT of Australia, to assess the sedation requirements and in-flight complications of retrieving these patients, and to review the optimal flight crew composition required to retrieve such patients.

Methods

Data were retrospectively collected from the air medical service's electronic database for all patients presenting with mental health problems requiring retrieval over a 12-month period between February 1, 2012, and January 31, 2013, inclusive. All cases were included in which the primary reason for retrieval was for psychiatric illness (ie, psychosis, thought disorder, depression, suicidal ideation, self-harm,

Careflight, Northern Territory, Australia

Address for correspondence:
Jodie A. Mills, CCRN, RM, MSc, PO Box 2219, Parap, Darwin, Northern Territory, Australia 0804, jodie.mills@careflight.org

1067-991X/$36.00

http://dx.doi.org/:10.1016/j.amj.2014.04.010

or violence to others). Exclusion criteria included acute delirium caused by a clear medical cause, instances of self-harm that involved significant traumatic injury such as airway compromise from hanging, or other medical emergencies that automatically necessitated the use of a flight doctor for medical reasons. Further information was acquired by a review of patient notes and ambulance records. Clinically relevant complications included adverse events of death, cardiac respiratory arrest, pneumothorax, or episodes of acute agitation. Physiologic complications included desaturation ($SaO_2 < 90\%$), hypotension (systolic blood pressure < 90 mm Hg), apneic episodes, or any arrhythmia. We also searched for documented flight crew resuscitative interventions suggestive of a complication such as fluid boluses, positive pressure ventilation, or initiation of inotropes. Documentation of sedation types and doses along with specific side effects of chemical sedation such as vomiting and laryngospasm were also investigated.

Results

During a 12-month period from February 1, 2012, to January 31, 2013, 262 patients meeting the inclusion criteria were retrieved.

Patient Characteristics

Of the 262 patients, 155 (59%) were male with a male:female ratio of 1.45:1. The age range was 13 to 63 years old with a mean age of 31 years. Five percent of patients retrieved were under the age of 18 years. Ninety percent of patients were indigenous.

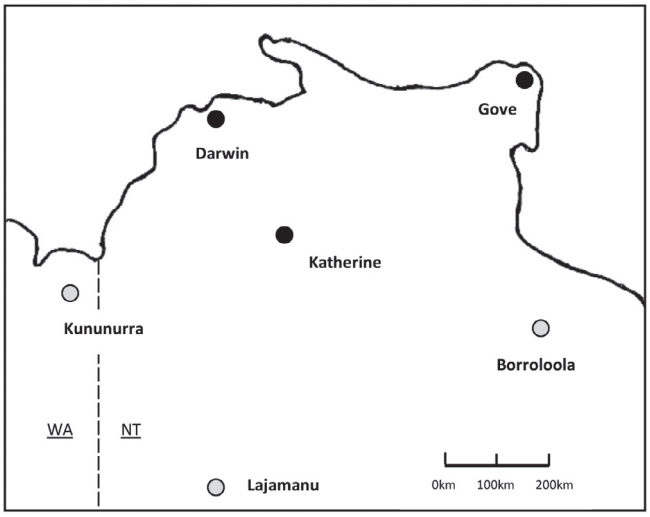
One hundred three patients (39%) had prior illicit substance use within 24 hours of retrieval. One hundred seventy-five patients (67%) retrieved had a previous history of mental illness, with 161 (61%) patients displaying acute psychotic behavior at the time of retrieval. Ninety-one patients (35%) were found to have a background of community violence, with 77 patients (29%) requiring the presence of local law enforcement at the community clinic on arrival of the retrieval team.

Retrieval Characteristics

All patients were retrieved using fixed wing transport with a mean retrieval time from departure from base to mission completion of 4 hours 40 minutes. Two hundred twenty-three patients (85%) were retrieved from remote area clinics, whereas 39 (15%) were retrieved from smaller hospitals. Eighty-one percent of retrievals occurred during the daylight hours of 7 am to 7 pm. Seventy-nine percent of retrievals required the presence of both a flight doctor and a flight nurse.

Fifty-five patients (21%) were retrieved by a flight nurse only. All of these patients displayed no evidence of aggression or previous psychiatric history on initial risk assessment. Therefore, the patients were assessed as being of low risk for retrieval. However, 4 of these patients did not respond to pre-arrival sedation and were so agitated on initial nurse assessment that it was believed necessary to give further sedation to ensure flight safety. All 4 patients were male, and all were retrieved at night.

Figure 1. Geographic Location of Major Hospitals (Black Circles) and Main Health Care Centers (Gray Circles) in the Top End of the NT of Australia (WA = Western Australia)



Sedation Requirements

Two hundred thirty-three patients (89%) were given a form of chemical sedation by the health care center or hospital before arrival of the retrieval team under the direction of the medical retrieval consultant. One hundred fifteen patients (44%) were given a combination of oral olanzapine 5 to 10 mg and diazepam 5 to 10 mg, whereas 40 patients (15%) required oral diazepam only and 15 (6%) patients required oral olanzapine only. Twenty-nine patients (11%) were given a combination of oral olanzapine 5 to 10 mg and intravenous (IV) midazolam 2 to 5 mg. Seventeen patients (6%) refused oral medication and required IV midazolam (Fig. 2). Seventy-four percent of the 233 patients requiring sedation before flight crew arrival achieved satisfactory sedation levels and did not require in-flight sedation.

Eight patients (3%) were found on medical retrieval team assessment to be extremely agitated and aggressive despite several oral and intravenous doses of benzodiazepine, and the decision was made to intubate for safe transfer. Seven patients underwent rapid sequence intubation using propofol and suxamethonium, whereas 1 patient was intubated using ketamine and suxamethonium. No reported complications of intubation occurred, and patients were then mechanically ventilated. Maintenance of anesthesia was continued using a propofol infusion in all patients.

One hundred seventy-three patients (66%) required no additional in-flight chemical sedation for safe flight transfer. Forty-seven patients (18%) required a single dose of midazolam to maintain sedation. In addition to midazolam, 9 (4%)