Sedative and analgesic management practices of Critical Care Air Transport Teams (CCATTs) for ventilated, critically injured patients

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Background

Military Critical Care Air Transport Teams (CCATTs) led by critical care and emergency physicians, nurses, and respiratory technicians are used to rapidly transport severely ill and traumatically injured patients. CCATTs transport critically ill patients with acute pain on flights as long as 10 hours while simultaneously maintaining hemodynamic stability.

Sedation and analgesics are administered during transport; however, limited data have been reported on en route administration practices and no study has reported analgesic use for CCATT-transported ventilated, critically ill patients.

Objective

To describe the sedative and analgesic administration practices of CCATT for management of ventilated, critically injured patients during evacuation from a combat setting.

Methods

A retrospective chart review was conducted to identify ventilated patients evacuated out of Iraq and Afghanistan via CCATT and receiving analgesia in-flight between March 2007 and December 2012.

Demographics, injury, vital signs, lab results, analgesia and anesthetics, and predefined clinical adverse events were abstracted from CCATT records.

Records were categorized by type of analgesics and anesthetics administered.

Department of Defense Trauma Registry (DoDTR) provided post-flight clinical outcomes and disposition at 30 days including mortality, on-going hospitalization, discharge, and return to duty.

Statistics: Conducted a descriptive review of the data. Categorical data was evaluated using chi-square or Fisher's exact tests. Continuous data were analyzed using Student's t-tests or Wilcoxon tests. Data reported as either percentages, mean±SD, or median[interquartile range (IQR)]. Significance was set at $p<0.05$.

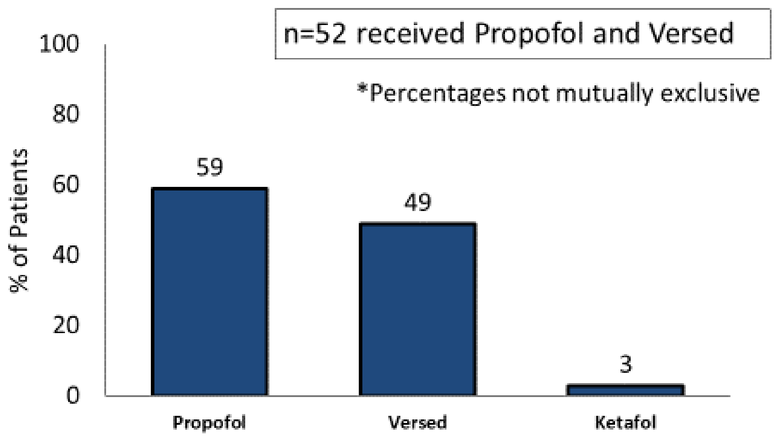
Results

We analyzed 651 ventilated patients that received analgesics in-flight.

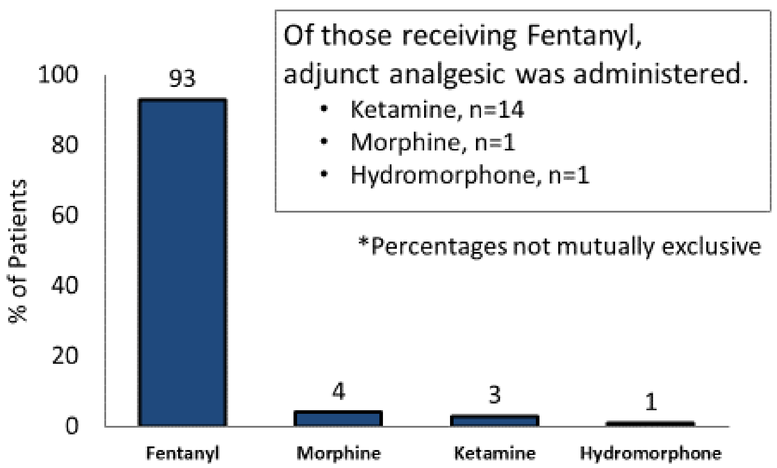
- 98% males with median age was 25 (IQR: 21-29)
- 71% blast, 18% penetrating, 8% blunt, and 3% burn
- 96% survival

98% received sedatives; 44% sedatives alone
57% received analgesics; 2% analgesics alone
56% received both sedatives and analgesics

Sedatives



Analgesics



Summary

Fentanyl
- More likely to have a dose increase (23% vs 7%; $p<0.0001$)
- Less likely to receive vasopressors (22% vs 72%;$p<0.0001$)

Morphine
- Fewer ICU days ($p=0.0117$)
- Shorter hospital stay ($p=0.0180$)

Ketamine
- Greater hear rate changes (68% vs 33%; $p=0.0073$)
- More ICU days ($p=0.0209$)

Other pain management medications
- Epidural, n=5 (all adjunct)
- Paralytic, n=25

No association between analgesics and hypoxia (spO_2 <90%, n=3)

No difference in clinical complications

Limitations

Retrospective study

Availability and accuracy of CCATT records

Missing or unavailable data

Subjectivity despite trained data abstractors

Conclusions

First study to report sedation and analgesic practices in the critical en route care of ventilated patients.

While the majority of patients received sedatives, 43% did not receive analgesics

Of the patients that received a paralytic in-flilght, 55% did not document reason for use instead of sedation or as an adjunct

More studies to better understand use of paralytics in combination

Best practice guidelines
- Optimize sedation and paralysis
- Increase analgesic use in critically injured, CCATT patients

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