Helicopter

Helicopter emergency medical services (HEMS) have provided benefit for severely injured patients. However, HEMS are likely overused for the transportation of both adult and pediatric trauma patients.

In a study, Elswick ET AL., aim to evaluate the degree of overuse of helicopter as a mode of transport for head-injured children. In addition, they proposed criteria that can be used to determine if a particular patient is suitable for air versus ground transport.

They identified patients who were transported to the facility for head injury. They included only those patients who were transported from another facility and who were seen by the neurosurgical service. They recorded a number of data points including age, gender, race, Glasgow Coma Score (GCS), and intubation status. They also collected data on a number of imaging findings such as mass effect, edema, intracranial hemorrhage, and skull fractures. Patients undergoing emergent nonneurosurgical intervention were excluded.

Of the 373 patients meeting inclusion criteria, 116 (31.1%) underwent a neurosurgical procedure or died and were deemed appropriate for helicopter transport. The remaining 68.9% of patients survived their injuries without neurosurgical intervention and were deemed nonappropriate for helicopter transport. Multivariable logistic regression identified GCS 3-8 and/or presence of mass effect, edema, epidural hematoma (EDH), and open-depressed skull fracture as appropriate indications for helicopter transport.

The majority of patients transported to the facility by helicopter survived their head injury without need for neurosurgical intervention. Only those patients meeting clinical (GCS 3-8) or radiographic (mass effect, edema, EDH, open-depressed skull fracture) criteria should be transported by air [1].

Elliot et al. analyzed mannitol dosing errors at peripheral hospitals prior to or during transport to tertiary care facilities for intracranial emergencies. They also investigated the appropriateness of mannitol use based on the 2007 Brain Trauma Foundation guidelines for severe traumatic brain injury.

They conducted a retrospective review of the Shock Trauma Air Rescue Society (STARS) electronic patient database of helicopter medical evacuations in Alberta, Canada, between 2004 and 2012, limited to patients receiving mannitol before transfer. They extracted data on mannitol administration and patient characteristics, including diagnosis, mechanism, Glasgow Coma Scale score, weight, age, and pupil status.

A total of 120 patients with an intracranial emergency received a mannitol infusion initiated at a peripheral hospital (median Glasgow Coma Scale score 6; range 3-13). Overall, there was a 22% dosing error rate, which comprised an underdosing rate (< 0.25 g/kg) of 8.3% (10 of 120 patients), an overdosing rate (> 1.5 g/kg) of 7.5% (9 of 120), and a nonbolus administration rate (> 1 hour) of 6.7% (8 of 120). Overall, 72% of patients had a clear indication to receive mannitol as defined by meeting at least one of the following criteria based on Brain Trauma Foundation guidelines: neurological deterioration (11%), severe traumatic brain injury (69%), or pupillary abnormality (25%).

Mannitol administration at peripheral hospitals is prone to dosing error. Strategies such as a pretransport checklist may mitigate this risk [2].

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Elswick CM, Wyrick D, Gurien LA, Rettiganti M, Gowen M, Pownall A, Bahgat D, Maxson RT, Öcal E, Albert GW. Resource utilization and indications for helicopter transport of head-injured children. J Pediatr Surg. 2018 May 1. pii: S0022-3468(18)30306-3. doi: 10.1016/j.jpedsurg.2018.04.032. [Epub ahead of print] PubMed PMID: 29792280.
2)
Elliott CA, MacKenzie M, O'Kelly CJ. Mannitol dosing error during interfacility transfer for intracranial emergencies. J Neurosurg. 2015 Jun 16:1-4. [Epub ahead of print] PubMed PMID: 26077141.