Changes in pCO_2 During Air-Medical Transport of Children with Closed Head Injuries

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Introduction: Inappropriate management of pCO_2 following head-injury can adversely affect outcome. We studied whether the optimal pCO_2 level was maintained in ventilated children with closed-head injuries transported by paramedics, and whether hand-bagging or mechanical ventilation resulted in better pCO_2 levels.
Methods: Hospital charts and transport records were reviewed for all head-injured children transported by a specialized paramedic team to tertiary care over a 12-month period. All of the children were intubated and mechanically or manually ventilated. Outcome measures were final pCO_2 prior to transport and first pCO_2 on arrival in the ICU.
Results: 29 children (age 0.6 to 16 years, median 6 years) met the criteria, 14 hand bagged (HB) and 15 mechanically ventilated (MV). 11 patients started in the target pCO_2 range of 35–45 mmHg: 5 HB and 6 MV. Following transport, 1 hand-bagged patient and 9 mechanically-ventilated patients had pCO_2 values within the target range. The duration of transport (range 15–200 minutes) did not contribute to final pCO_2 level.
Conclusions: Mechanical ventilation is preferable to hand-bagging. Those managing head-injured patients in a disaster need to be aware that hand-bagging significantly increases the incidence of sub-optimal pCO_2 levels and the risk of sub-optimal cerebral blood flow, and that monitoring of CO_2 (e.g., by point-of-care testing) is desirable.
Keywords: closed head injury; CO_2, monitoring of; pCO_2; transport; ventilation
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Methods of Self-aid and Mutual-aid of the Injured in Earthquake and Points for Attention

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Self-aid and mutual-aid for the injured in an earthquake generally is carried out by the survivors and the injured before the arrival of exterior rescue teams. Such actions have great significance in lowering the mortality and alleviating the pain of the injured.

First, according to the disaster relief experiences from the 1976 Tangshang Earthquake, the procedures of self-aid and mutual-aid of the person under ruins were identified and included exposure of the head and chest first followed by the provision of food, boosting the confidence of the trapped that they will be saved and to hold on, etc.

Second, the authors introduce kinds of organization that are helpful to the provision of mutual-aid for the masses, which include mutual-aid for the family, mutual-aid for those injured located on the streets, mutual-aid among rescue units, and mutual-aid implemented by militia and the Peoples' Liberation Army (PLA).

Finally, the presentation directs attention to the course of the rescue efforts: 1) Search for the injured carefully; 2) Diagnose the condition of injury correctly; and 3) Treat the condition of injury promptly. Several examples from the activites associated with the Tangshang Earthquake are used to illustrated the views of authors. Each of these experiences should be applied in future Disaster Medicine relief.
Keywords: assistance; disaster; earthquake; initial aid; lay public; organization; plans; priorities; rescue; survivors