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**Emergency Intubation with the Combitube: Comparison with the Endotracheal Airway**

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**Objective:** To evaluate the safety and effectiveness of the Combitube in the hands of intensive care unit nurses under medical supervision compared to the endotracheal airway in the hands of intensive care unit physicians during cardiopulmonary resuscitation.

**Methods:** A prospective study of intensive care patients was performed over a seven-month period. Thirty-seven patients suffering from cardiac arrest were studied in a medical intensive care unit. Patients underwent emergency intubation with either the Combitube inserted by nurses or with the endotracheal airway introduced by physicians, and subsequent mechanical ventilation. Intubation time and blood gases were analyzed.

**Results:** Intubation time was shorter with the Combitube (18.5  $\pm$  6.2 vs 27.2  $\pm$  7.3 seconds,  $p < .001$ ). Evaluation of blood gases after 20 minutes of mechanical ventilation showed comparable results between both devices. The mean PaO<sub>2</sub> values were slightly higher during ventilation with the Combitube (123.5  $\pm$  19.6 vs 106.5  $\pm$  20.3 mmHg,  $p < .001$ ).

**Conclusion:** The Combitube in the hands of intensive care nurses was as effective as the endotracheal airway in the hands of intensivists during cardiopulmonary resuscitation. The Combitube may be used whenever endotracheal intubation cannot be performed immediately.

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**The Use of Ketamine in Prehospital Trauma Care**

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**Introduction:** The current analgesics used in prehospital trauma care all have their drawbacks, such as low analgesic potency, hypotension, potency to hinder ventilation, etc. The use of Ketamine hydrochloride may overcome most of these drawbacks.

**Methods:** A feasibility study was conducted with ketamine hydrochloride in prehospital trauma care used by the paramedic crew. In a prospective study, treatment with ketamine hydrochloride in low doses intravenously was given to 138 trauma patients based on a protocol. For practical reasons, a verbal descriptive scale was used.

**Results:** In 87% of this group, ketamine hydrochloride was able to reduce the pain significantly during transport. The majority of the side effects seen were of psychic origin. They never lasted longer than several minutes and never hindered further aid of investigation. Serious side-effects were not seen.

**Conclusions:** These data suggest that intravenous, low-dose ketamine in prehospital trauma care, used by the paramedic crew, is a feasible analgesic. Further research comparing ketamine hydrochloride with other analgesics used in prehospital trauma care seems to be desirable.

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**Maintenance of Ventilation during Anaesthesia with the Azeotropic Mixture of Halothane-Diethyl-Ether in Contrast to Isoflurane**

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**Objective:** It has been claimed, but not shown, that the regulation of breathing is maintained during halothane-diethyl-ether azeotrope (HE) anaesthesia.<sup>1</sup> This could make the HE attractive as a volatile anaesthetic during difficult or primitive circumstances. The purpose was to evaluate the influence of HE and Isoflurane (ISO) anaesthesia on the regulation of ventilation.

**Methods:** Twelve healthy patients undergoing minor orthopaedic surgery were included in the study. Dosages of either HE (n = 6) or ISO (n = 6) were allocated randomly. Evaluation of resting ventilation and ventilation stimulated by hypercarbia and hypoxaemia,<sup>2</sup> was done on three occasions: before anaesthesia; after inhalational induction of anaesthesia when the level of anaesthesia was 1.3 MAC; and 30 minutes after the end of the operation.

**Results:** No difference was found in resting minute ventilation before anaesthesia as compared to during anaesthesia in the HE group. In the ISO group, resting ventilation decreased significantly, 6.7  $\pm$  1.4 l/min<sup>-1</sup> before compared to 4.6  $\pm$  1.9 l/min<sup>-1</sup> during anaesthesia ( $p < .05$ ). The increase in carbon dioxide tension during anaesthesia (resting ventilation) was significantly higher in the ISO group compared with HE group ( $p < .001$ ) 8.3  $\pm$  0.9 to 6.4  $\pm$  0.2 kPa. Furthermore, there was a maintained ventilatory response to hypercarbia in the HE group, but not in the ISO group ( $p < .01$ ). The response to hypoxaemia decreased in both groups. Postoperatively, both groups responded normally to hypoxaemia and carbon dioxide loading. It is an interesting finding that the 33 vol% of ether in the azeotropic mixture counteracts the ventilatory depression of halothane, and that the response to CO<sub>2</sub> loading is preserved postoperatively in both groups.

**Conclusion:** Ventilation is well-maintained during HE anaesthesia.

**References**

1. Dery, R, Pelletier J, Jaques A: Comparison of cardiovascular, respiratory, and metabolic effects of halothane-ether azeotropic mixture with those of methoxyflurane anaesthesia in man. *Can Anaes Soc J* 1964;11:394-409.
2. Johnson A, Lofstrom J B: A new method for studying the ventilatory response in patients. *Acta Anaes Scand* 1990;34:440-446.