Clinical Evaluation Of Penthrox® (Methoxyflurane) And Tramadol For The Singapore Emergency Ambulance Service

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Abstract

Purposes

Ideal characteristics of pre-hospital analgesia include effective, fast onset pain relief and ease of use. We aim to compare the effectiveness of Inhalational Penthrox® (Methoxyflurane) and intramuscular (IM) Tramadol in the treatment of acute pain in patients transported by the national emergency ambulance service.

Methods

An prospective, cluster-randomized, cross-over evaluation study was conducted over 1 year. Randomization was at fire-station level. Patients (>16 years old) with acute pain who utilized EAS were either given Penthrox® or Tramadol for pre-hospital analgesia. Data analyzed include verbal numerical rating scores (VNRS), time variables, adverse effects, Ramsay sedation scores (RSS) and satisfaction scores based on patient and paramedic surveys.

Results

135 and 176 patients were enrolled and given Penthrox® and Tramadol respectively. Patient VNRS dropped with median of 3.0(IQR-1.3,4.8) and 2.0(IQR-1.0,3.0) from baseline to 5 and 10 minutes respectively for Penthrox®, with 1.0(IQR-0.0,2.0) and 1.0(IQR-0.0,2.0) for Tramadol. The median time taken for effective analgesia was 3.0(IQR-1.0,5.0) and 5.0(IQR-3.0,5.0) minutes for Penthrox® and Tramadol respectively. Paramedics took a median time of 9.0(IQR-6.0,14.0) and 11.0(IQR-8.0,15.0) minutes to administer the first dose of Penthrox® and Tramadol respectively upon arrival of scene. Mild adverse events occurred in 63 (46.6%) and 13 (7.4%) patients with 12 (9.2%) and 4 (2.3%) patients achieving RSS of ≥3 for Penthrox® and Tramadol respectively. Penthrox® had higher median satisfaction scores than Tramadol in "speed of onset" and "effectiveness of relief".

Conclusion
Inhalational Penthrox® is more effective in pain relief, speed of onset and administration, with more minor and sedative side effects than IM Tramadol.

Word Count: 250