A review of the use of ketamine in adult burn injuries

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INTRODUCTION

Pain management during dressing changes is a particularly distressing aspect of treatment in acute burn injuries.[1] Unlike traditional drugs such as opioids, ketamine possesses unique analgesic and dissociative properties, and usually preserves airway reflexes and spontaneous respiratory function. In combination with other drugs such as midazolam and dexmedetomidine or tramadol, ketamine offers effective pseudo-analgesia whilst adjuvant drugs ameliorate adverse effects such as hallucinations and tachycardia. [2,3]

RESULTS

A comprehensive electronic search using PubMed, Embase, Science Direct, and Cochrane was performed to identify clinical trials comparing ketamine with placebo and other drugs in adults with burn injury. McGuinness SK et al. (2011) identified multiple clinical trials with data suggesting efficacy as an analgesic for burn injuries, however all studies included healthy volunteers with an applied burn injury under laboratory conditions. Under laboratory conditions, IV ketamine at 0.3mg/kg/hr showed a statistically significant reduction in hyperalgesia at the site of injury when compared to placebo or a dose of 0.15mg/kg/hr. Bolus and infusion based regimes showed statistically significant reduction in secondary punctuate and brush hyperalgesia ($P<0.04$ and $P<0.002$ respectively).[1]

Secondary hyperalgesia or 'wind up' pain is an important component of the patient experience and is exacerbated by the mechanical stimulation of dressing changes. Intramuscular administration of ketamine may be advantageous in burn patients because of a prolonged duration of effect, and in combination with opioids and anxiolytic agents ameliorate unwanted effects.[4]

SAMPLE GUIDELINE – KETAMINE SEDATION FOR ADULT BURN DRESSING CHANGES[5]

1. Ketamine 0.5mg/kg (or 50mg max) IV bolus over 3-5 minutes

2. Then, initiate Ketamine 0.05mg/kg/hr infusion, titrate by 0.05mg/kg/hr increments to max 1mg/kg/hr to SAS 3-4 or RASS -1 to 0 during the dressing change, discontinue at the end of the dressing change

3. Midazolam 1-2mg IV at induction and 0.5-2mg IV at the conclusion of the procedure just prior to discontinuation of the ketamine infusion

4. Midazolam and fentanyl may be administered as needed during the procedure in addition to ketamine

5. Emergency equipment (BVM, oxygen, and suction) should be in the room during the dressing change

CONCLUSION

The use of ketamine as a clinical tool may significantly enhance our understanding of the drug in its use for adult burn victims. After 50 years since its inception, there is a paucity of Class I evidence guiding the use of ketamine in this population, and existing studies cannot be pooled owing to heterogeneity. Given this quagmire, institution specific guidelines, admittedly based chiefly on empirical evidence, may assist clinicians in the interim. Further robust randomised clinical trials ought to be conducted in burn-specific adult populations to permit development of more compelling evidence based guidelines to support its clinical use and aid the multidisciplinary team in addressing acute burn pain in adults.

REFERENCES
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