THE EFFICACY OF INTRANASAL ADMINISTRATION OF DEXMEDETOMIDINE, KETAMINE AND MORPHINE COMBINATION TO RABBIT

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ABSTRACT

The sedative effects of intranasal dexmedetomidine, ketamine and morphine combination were evaluated in rabbits. A combination of 0.1 mg/kg dexmedetomidine, ketamine 20 mg/kg and 0.4 mg/kg morphine was administered by inserting a lubricated catheter in intranasal. The sedation score was classified as ‘deep’ from 2 to 20 minutes, ‘moderate’ from 20 to 30 minutes, the sedation level was insufficient from 30 to 45 minutes. The rabbits were all awake at 60 minutes. The analgesic score stayed highest (absence of Pedal withdrawal reflex) from 2 to 20 minutes. Heart rate and rectal temperature did not change significantly from baseline at any time. Respiratory frequency decreased significantly (P<0.05) from baseline. Also SpO2 progressively dropped 10–15 minutes when O2 supplementation was started, increasing significantly. PaCO2 enhanced significantly (P<0.05) at 15, mins and PaO2 lessening significantly (P<0.05) at 15, mins compared with baseline value. The intranasal dexmedetomidine-ketamine-morphine combinations has been successfully used for deep sedation for 20 minutes in rabbits.

INTRODUCTION

The studies have shown that transnasal route is an effective way to administer sedation and premedication to human (Henderson et al., 1998; Rey et al., 1991; Kendall et al., 2001). It is a easy non-invasive route and rapid onset of action comparable to that of IV administration because of the rich blood supply of the airway mucosa and bypassing the first pass hepatic metabolism. Also, this route is not painful and does not require trained personnel (Hadley et al., 2004). Intranasal administration may be an acceptable route of administration for bird (Vesal and Eskandari, 2006; Vesal and Zare, 2006; Moghadam et al.,2009; Mans et al., 2012), tortoise (Schnellbacher et al.,2012), dog(Eagleson, 2012),cat(Marjani, 2015) and rabbits (Robertson and Eberhart 1994).Limited information is available on rabbits (Raekallio et al., 2002; Santangelo et al., 2015; Santangelo et al., 2016).In rabbits, intranasal administration of 25 mg/kg ketamine has an onset time of 1.2 minutes and duration of approximately 25 minutes.1.0 mg/kg midazolam and 25 mg/kg ketamine combinations has an onset time of 2 minutes and duration of approximately 52.5 minutes (Robertson and Eberhart, 1994). Dexmedetomidine is specific α2 adrenoreceptor agonist that has both sedative and analgesic effects and reduction of anesthetic requirements together with increased hemodynamic. The respiratory depressant effects of dexmedetomidine have been studied in rabbits by Nishida et al., (2002). Dexmedetomidine can be effectively administered via the intranasal route in humans and animals (Yuen et al., 2008; Schnellbacher et al., 2012). Ketamine hydrochloride produces dissociative anaesthesia that is characterized by catatonic, amnesia and analgesia with or without actual loss of consciousness. In rabbits, intranasal ketamine or ketamine / midazolam combinations have been used for preinduction of anesthesia (Robertson and Eberhart 1994). Morphine, produce their pharmacological actions, including potent analgesia, as shown by its intranasal administration in humans (Kendall et al., 2001). But clinical trials that investigate the sedative effect of a mixture of intranasal dexmedetomidine, ketamine and morphine are absent. The aim of this study was to investigate the analgesic and sedative effect of intranasal dexmedetomidine, ketamine and morphine combinations in rabbits.

MATERIALS AND METHODS

Experiment was conducted in the Animal Hospital of Veterinary Faculty of the Firat University of Turkey and the protocol for the use of animals was approved by the National...
RESULTS

Baseline.

Respiratory frequency decreased significantly (P<0.05) from 2 to 20 minutes. Heart rate and rectal temperature did not change significantly from baseline at any time. Analgesic score stayed highest (absence of pedal withdrawal reflex) from 2 to 20 minutes. Heart rate and rectal temperature were presented as the mean ± SD. Normally distributed data are expressed as the mean ± SD, n = 8; *Values decreased significantly (P<0.05) from baseline.

The data for parametric or nonparametric observations were analyzed using I


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