



Brief Report

Does midazolam enhance pain control in prehospital management of traumatic severe pain? ☆☆☆☆☆



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ABSTRACT

Purpose: Midazolam comedication with morphine is a routine practice in pre and postoperative patients but has not been evaluated in prehospital setting. We aimed to evaluate the comedication effect of midazolam in the prehospital traumatic adults.

Methods: A prehospital prospective randomized double-blind placebo-controlled trial of intravenous morphine 0.10 mg/kg and midazolam 0.04 mg/kg vs morphine 0.10 mg/kg and placebo. Pain assessment was done using a validated numeric rating scale (NRS). The primary end point was to achieve an efficient analgesic effect (NRS ≤ 3) 20 minutes after the baseline. The secondary end points were treatment safety, total morphine dose required until obtaining NRS ≤ 3 , and efficient analgesic effect 30 minutes after the baseline.

Findings: Ninety-one patients were randomized into midazolam (n = 41) and placebo (n = 50) groups. No significant difference in proportion of patients with a pain score ≤ 3 was observed between midazolam (43.6%) and placebo (45.7%) after 20 minutes (P = .849).

Secondary end points were similar in regard with proportion of patients with a pain score ≤ 3 at T30, the side effects and adverse events except for drowsiness in midazolam vs placebo, 43.6% vs 6.5% (P < .001). No significant difference in total morphine dose was observed, that is, midazolam (14.09 mg \pm 6.64) vs placebo (15.53 mg \pm 6.27) (P = .315).

Conclusions: According to our study, midazolam does not enhance pain control as an adjunctive to morphine regimen in the management of trauma-induced pain in prehospital setting. However, such midazolam use seems to be associated with an increase in drowsiness.

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1. Introduction

Today, acute pain management through morphine titration is a common practice in pre and postoperative and emergency settings [1–6]. However, most treated patients continue to complain of pain or are relieved of pain only after a long analgesia administration

time [7]. Pain has a very complex neurophysiologic and neuropsychologic mechanism. Morphine-midazolam concomitant treatment has been reported to allow a better sedation (use of a lower dose of morphine) and faster pain relief through an analgesic pathway comprising both components of pain mechanism [8,9]. This combination of treatment has been advised by many authors [10–12] and used widely for pain control in traumatic patients [13,14]. In France, expert guidelines suggest that midazolam is the most appropriate benzodiazepine for sedation [15,16]. Midazolam pharmacologic properties seem interesting: sedative, hypnotic inductor, anxiolytic, muscle relaxant, and amnesic [17–19]. As a sedative agent, midazolam has been reported to allow a conscious sedation and a better analgesia [9,20,21]. Furthermore, as a comedication in pre and postoperative settings, midazolam has allowed the use of a lower dose of morphine [21]. Its pharmacologic activity is characterized by its fast action (3 minutes) and by its very short plasma half-life. The presence of an antidote is an additional advantage for its safety of administration [17,20–22]. (See Fig.)

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★ Author contributions: YA conceived the study, designed the trial, and obtained research funding. YA, MR, JJ, and FS supervised the conduct of the trial and data collection. YA, MR, JJ, and FS undertook recruitment of participating centers and patients and managed the data. MG and GRJ provided statistical advice on study design and analyzed the data. ZA drafted the manuscript and interpreted the outcomes, and all authors contributed substantially to its revision. YA takes responsibility for the manuscript as a whole.

★★ Conflict of interest: The authors declare no conflicts of interest.

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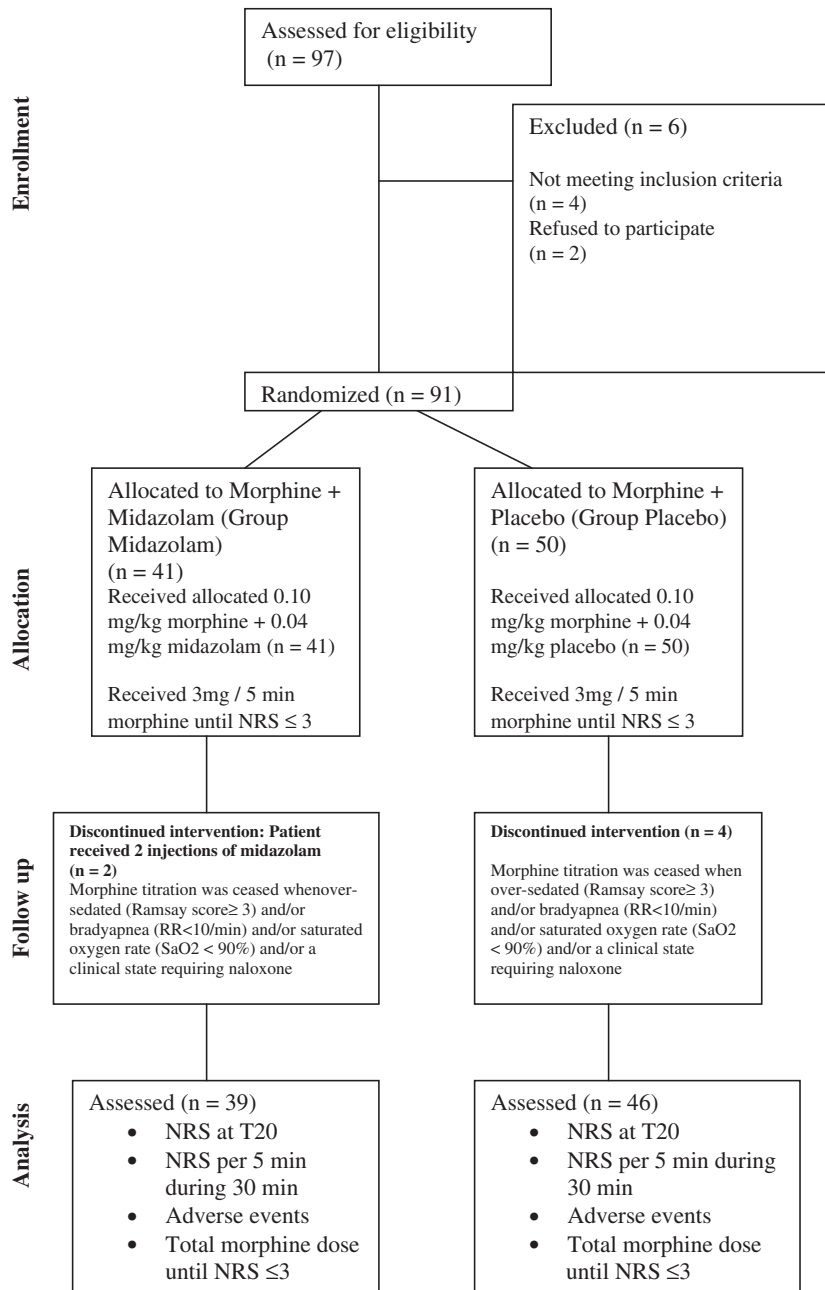


Fig. Flowchart showing the flow of participants through each stage of our randomized trial.

1.1. Importance

Using midazolam as a comedication is common in pre and postoperative patients but nonevaluated in traumatic patients with acute severe pain in prehospital settings. To our knowledge, this is the first study evaluating the adjunctive role of midazolam to morphine for pain control in prehospital management of traumatic severe pain.

1.2. Goals of this investigation

We aimed to test the comedication effect (ie, analgesia and sedation) of midazolam in prehospital setting. Our goals were as follow: pain control and assessment of side effects and adverse events in the trauma-induced pain management in prehospital setting.

2. Methods

2.1. Study design

A prospective, multicenteric, randomized double-blind placebo-controlled trial of morphine sulfate at 0.10 mg/kg–midazolam 0.04mg/kg vs morphine–placebo was performed in traumatic patients with acute severe pain (numeric rating scale [NRS] ≥ 6) [23].

2.2. Setting

The study was conducted in prehospital emergency services of Brest, Carhaix, Quimper, Concarneau, Douarnenez, and Nantes, between November 5, 2006, and September 30, 2009. Data collection was done by each center's service mobile d'urgence et de réanimation

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