Title: EVALUATION OF 2-CHLOROPROCAINE AS AN EFFECTIVE INTRAVENOUS TEST DOSE FOR EPIDURAL ANALGESIA

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Introduction: Identification of the intravenous placement of an epidural catheter is imperative. Fifteen micrograms epinephrine produces recognizable cardiovascular changes in nonlaboring patients and is widely used as an intravenous test dose (1). However, recent evidence suggests that 15 mcg epinephrine may be both an unsafe (2) and an unreliable (3) intravenous test dose in laboring obstetrical patients. An alternative is to use a subconvulsant dose of a plain local anesthetic which, if injected intravenously, would produce clinically evident central nervous system symptoms. This study evaluates the safety and efficacy of 100 mg 2-chloroprocaine as an intravenous test dose.

Methods: Following approval by the Clinical Research Practices Committee and after obtaining informed consent, we inserted intravenous catheters in 20 healthy male volunteers and began a saline infusion. We recorded blood pressure and pulse every minute, and continually monitored the electrocardiogram. Using a double blind technique, the subjects received two 5 ml injections, each over 5 seconds: one saline injection and one containing 100 mg 2-chloroprocaine. All injections were made in a random order and separated by at least 15 minutes. The subjects were unaware of the time of injection. Two minutes after injection, we asked the subjects if they experienced unmistakable central nervous system symptoms, questionable symptoms, or no symptoms. If they reported unmistakable symptoms, the subject classified the overall strength of symptoms as mild, moderate, or marked; and the specific symptoms experienced were described.

Results: The results are summarized in table 1. All 20 volunteers reported unmistakable symptoms, lasting an average of 2 minutes, which began within 2 minutes of receiving 100 mg 2-chloroprocaine. The most common single symptom was a change in auditory perception (either tinnitus or an altered perception of voices and sounds), which was reported by 19 subjects. All 20 subjects reported either body warmth, dizziness, or mental detachment. Nine subjects classified the symptoms as marked, 8 as moderate, and 3 as mild. No symptoms followed saline injections, and questionable symptoms were not reported after either solution. Blood pressure, heart rate, and cardiac rhythm did not change following any injection.

Discussion: One hundred mg of intravenous 2-chloroprocaine reliably produced symptoms in healthy male volunteers. Two-chloroprocaine was sensitive (100%) and specific (100%). This compares favorably with the sensitivity (unknown) and specificity (76-88%) (3) of 15 mcg of epinephrine in laboring obstetrical patients. Symptoms following 100 mg of 2-chloroprocaine lasted longer (2 minutes) than those reported following epinephrine (32 seconds) (1) and may thereby increase the likelihood of being noted. We recommend further investigation of 2-chloroprocaine as an intravenous test dose.

Table 1
Incidence and Strength of Central Nervous System Symptoms (n=20)

	Saline	100 mg of 2-chloroprocaine
No Symptoms	20	0
Questionable Symptoms	0	0
Unmistakeable Symptoms	0	20
Marked	0	9
Moderate	0	8
Mild	0	3

References:
1. Moore DC, Batra MS: The components of an effective test dose prior to epidural block. Anesthesiology 55:693-696, 1981
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3. Cartwright PD, McCarroll SM, Antzaka C: Maternal heart rate changes with a plain epidural test dose. Anesthesiology 65:226-228, 1986