

Title : DOES ATROPINE CONCEAL THE HEART RATE RESPONSE TO AN EPIDURAL TEST DOSE ?

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**INTRODUCTION:** A test dose of 15 µg of epinephrine diluted in 3 ml of 2 % lidocaine is said to induce an increase in heart rate (HR) when injected intravenously (1). The effect of atropine on the response to this test dose has never been studied. By increasing basal HR, atropine may conceal the tachycardia observed after a test dose. The aim of this study was to evaluate the effects of atropine on the changes in HR following iv injection of a test dose.

**METHODS:** After institutional approval, informed consent was obtained from 90 ASA PS I-II patients of both sexes. Patients receiving beta-blockers, verapamil and/or antiarrhythmic drugs were excluded from the study. Patients were scheduled for general surgery (n = 52) or other minor procedures (n = 38). Thirty four patients received no premedication, 44 received hydroxyzine, 100 mg P.O. and 12 received a combination of hydroxyzine and phenoperidine 0.5 mg. After entering the operating room, an iv infusion was started and patients were randomly assigned to two groups: group I received 1 ml of saline iv; group II received 0.5 mg of atropine iv. Five min later both groups received an iv injection of the test dose (3 ml of 2% lidocaine with 15 µg epinephrine) at a rate of 1 ml/s. Heart rate was continuously monitored with lead II of the ECG and the rate recorded, before (T0) and 0.5, 1, 2, 3, and 5 min after injection of saline or atropine and 0.5, 1, 2, 3 min after injection of the test dose. Two ways repeated measures ANOVA was used for within and between groups comparisons of the changes in HR, followed by t test or Neuman-Keuls test as appropriate. HR immediately before each treatment (atropine or saline, or test dose) was used as the reference value for statistical comparisons. The value of the maximum increase in HR (maximum ΔHR) after the test dose also was noted. A Woolf G test was used to compare the number of patients in both groups in whom HR did not increase after the test dose. Results are reported as the mean ± SD. p < 0.05 was considered statistically significant.

**RESULTS:** Group I (n=46) and group II (n=44) were similar in age (47±18 vs 46±17 years) and sex (21 M, 25 F vs 21 M, 23 F). HR increased significantly at all times after atropine injection, whereas there were no changes in HR after saline injection (fig 1). After injection of the test dose, HR increased significantly in both groups at each time interval. Maximum ΔHR after the test dose was significantly higher (p < 0.001) in patients administered atropine (31.5 ± 14 bpm) than in patients treated with saline (26 ± 15 bpm) (fig 2). Three patients in group I exhibited no increase or had a decrease in HR after the test dose injection, whereas all patients in group II had an increase in HR (p < 0.05).

**DISCUSSION:** Patients who received atropine had a greater increase in HR following the test dose injection than those who received saline. Moore reported a mean maximum increase in HR of 32 bpm following

injection of 15 µg of epinephrine in adult patients given diazepam and fentanyl premedication (1). We found a similar mean maximum increase in HR. However, if a positive response to the test dose is defined as an increase in HR of at least 25 bpm (1, 2), then 54 % of patients in group I (saline) and 36 % in group II (atropine) would have had false negative responses since their HR changes following test dose were less than or equal to 25 bpm. Moreover, 3 patients out of 46 in group I exhibited no increase or even had a decrease in HR after the test dose. We conclude that a test dose using 15 µg of epinephrine is less reliable than has been reported for the detection of intravascular injection of local anesthetics. Atropine (0.5 mg), injected iv prior to the test dose does not conceal the effects of the test dose and may actually improve its sensitivity.

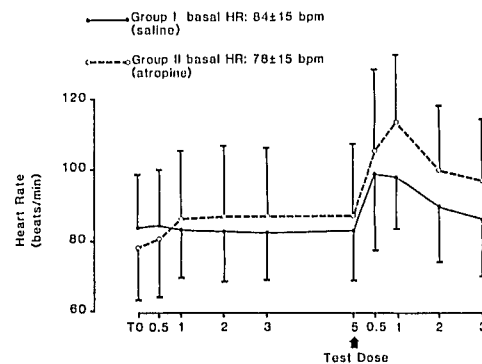


Figure 1. Increase in HR following atropine and test dose injection.

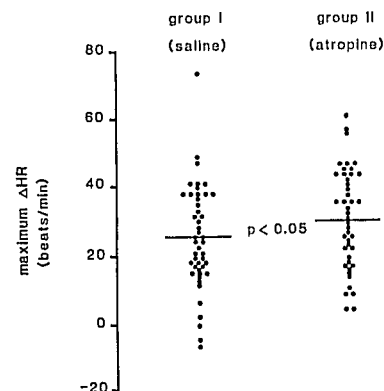


Figure 2. Maximum ΔHR observed after test dose injection.

**REFERENCES:** 1. Moore DG, Batra MS. ANESTHESIOLOGY 55 : 693-696, 1981.  
2. Dain SL, Rolbin SH. Can Anaesth Soc J 34: 601-605, 1987.