

## DOES SPINAL ANESTHESIA RESULT IN A MORE COMPLETE SYMPATHECTOMY THAN EPIDURAL ANESTHESIA?

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**INTRODUCTION:** Epidural anesthesia using lidocaine has been shown to incompletely attenuate the sympathetic response to cold pressor test (1). To see if spinal anesthesia using lidocaine results in a more profound attenuation of the sympathetic response, we performed this study.

**METHODS:** After institutional review board approval and written informed consent, 10 volunteers underwent both epidural and spinal anesthesia in randomized order, using 600 mg plain lidocaine (epidural) and 100 mg hyperbaric lidocaine (spinal). Blood pressure (BP), heart rate (HR), non-invasive cardiac index (CI), plasma norepinephrine (NE), and plasma epinephrine (E) were measured at the following four stages: 1. 20 minutes after arterial line placement (baseline resting), 2. during first cold pressor test (no conduction anesthesia), 3. 30 minutes after injection of lidocaine for conduction anesthesia, and 4. during second cold pressor test (during conduction anesthesia). Epinephrine and norepinephrine were measured using the radioenzymatic method. Motor block (Bromage scale 0-3) of the lower extremities was recorded at stages 3 and 4. Repeated measures or Wilcoxon signed rank test were used to test for significance, set at  $P < 0.05$ .

**RESULTS:** During the first cold pressor test BP, HR, CI, NE, and E all increased. There were no differences in these variables between stages 1 and stage 3, except for a slight decrease in HR during spinal anesthesia. Epidural and spinal anesthesia produced a median (range) motor block score of 2 (1-2) and 3(3-3), respectively ( $P < 0.004$ ). There were no differences in the median level of analgesia between epidural (T-4) and spinal (T-3) anesthesia, nor any differences in measured variables between epidural and spinal anesthesia at any stage. Both epidural and spinal anesthesia attenuated increase in BP to a cold pressor test. Increases in HR, NE, and E were not attenuated by either technique.

**DISCUSSION:** Neither epidural nor spinal anesthesia using lidocaine completely attenuate the sympathetic response a stress applied to an unblocked dermatome, despite extensive sensory and motor block. Presence of motor and sensory block does not guarantee complete sympathectomy. The mechanism of reported attenuation of catecholamine response to surgical stress (2) may well result from afferent sensory block and not blockade of efferent sympathetic innervation to the adrenal medulla.

**REFERENCES:** 1. Anesthesiology 79:1219-1226, 1993.

2. Acta Anesthesiol Scand 24:17-21, 1980.