

Title: REDUCED EFFECTIVENESS OF BUPIVACAINE 0.5% TO RELIEVE LABOR PAIN AFTER PRIOR INJECTION OF CHLOROPROCAINE 2%

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Introduction. A clinical impression that bupivacaine did not relieve labor pain effectively when preceded by chloroprocaine led to this formal trial in which bupivacaine 0.5% was used after the prior administration of chloroprocaine 2% or bupivacaine 0.25%.

Method. With the approval of the Institutional Review Board informed consent was obtained from 68 parturients to participate in the trial. All were in the first stage of labor at a cervical dilation of between 4 and 6 cm and having painful contractions at 3 min intervals or less. They were allocated randomly in a double blind manner to 2 groups. The chloroprocaine - bupivacaine (CB) group received an initial injection through the epidural needle of 10 ml (2 ml test dose followed by 8 ml) of chloroprocaine 2%. The bupivacaine - bupivacaine (BB) group received 10 ml of bupivacaine 0.25% in a similar manner. When pain recurred 8 ml of bupivacaine 0.5% was administered. The degree of pain relief was graded on a 4 point scale and the time to the first relatively painless contraction and the next painful contraction was recorded. Patients receiving no pain relief after either the first or second injection were given an augmentation dose of 6 ml which demonstrated whether or not they had a functional epidural.

Results. There was no substantial difference between the groups in respect to maternal age, height and weight. The weight of the infants and the number of primigravida in each group was similar. All parturients received substantial pain relief after the first injection in both groups and after the second injection in the BB group but 4 had to be given an augmentation dose following the second injection in the CB group. A comparison of the effectiveness of pain relief after the second injection (bupivacaine 0.5%) was made between pairs of patients, one from the CB group and one from the BB group. The result was plotted on the statistical sequential diagram (Figure 1) which was drawn so that the risk of a type 1 error was $<.01$, the risk of a type 2 error was $<.05$ and the difference to be detected was such that 80% of preferences were for 1 of the 2 treatments. A line was plotted one space in a "North-East" direction for each preference for the BB group and one space in a "SouthEast" direction for each preference in the CB group. After the 23rd paired comparison in which there was a preference for 1 treatment the plotted line crossed the upper boundary of the diagram indicating that BB gave more effective pain relief ($p<.01$). The time to the first relatively painless contraction after the second injection was 8.2 ± 0.9 min in the BB group compared with 11.0 ± 0.75 min in the CB group. The duration of pain relief after the second injection was 121 ± 9.3 min in the BB group compared with 93 ± 5.8 min in the CB group ($p<.01$).

Conclusions. The relatively large amount (8 ml) of a high concentration of bupivacaine (0.5%) was chosen for the second injection because it should have given a high percentage of successful blocks. It did not in the CB group. Compared with the BB group the block in the CB group took longer to set up, reduced pain by a substantially smaller amount, had a shorter duration of action and more frequently had to be augmented. It is concluded that chloroprocaine probably interferes with the action of subsequently administer bupivacaine.

References.
McPherson CK and Armitage P: Repeated significant tests on accumulating data when the Null hypothesis is not true. J.R. Statis Soc 134:15-25, 1971.

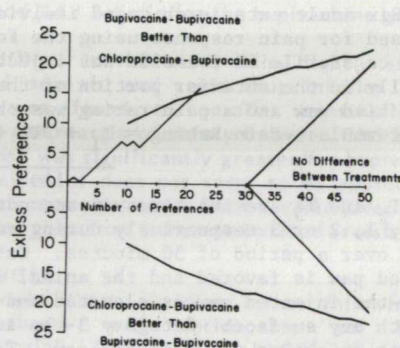


Fig 1. Sequential Analysis of Effectiveness of Pain Relief in Labor with Bupivacaine 0.5% after Prior Injection of Chloroprocaine 2% or Bupivacaine 0.25% ($\theta = 0.8$, $2\alpha = 0.01$, $1-\beta = 0.95$, $N = 51$)