

TITLE : EPIDURAL FENTANYL WITH AND WITHOUT EPINEPHRINE PLASMA LEVELS AND PAIN RELIEF

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INTRODUCTION

A bolus of epidural fentanyl has become widespread in C. section or management of labor under regional anesthesia to improve analgesia. Wide variations of plasma fentanyl level have been reported (2) ; as a consequence, high plasma fentanyl levels may have deleterious systemic effects. The epinephrine added to opiates was proposed to decrease the plasma opiate levels. The aim of this study was to compare epidural fentanyl with and without epinephrine (without local anesthetics) on plasma fentanyl levels and on pain relief, at the beginning of an induced labor far from birth.

METHODS

Twenty primiparas ASA I, who were induced for labor, gave informed consent and were randomized into two groups. First an epidural catheter was inserted in the third lumbar space, labor was induced ; the fetal heart rate was supervised by external monitoring. When the patients asked for pain relief, they received, in double blind, the same volume of either epidural fentanyl 1.5 mcg.-kg-1 (group I n = 10), or epidural fentanyl with epinephrine 1/200000 1.5 mcg.kg-1 (group II n = 10). Pain was measured using a 10-cm visual analogue scale, before injection and at 5-min. intervals until the patient asked again for pain relief ; then plain bupivacaine was injected. The results were noted in subjective pain relief S.P.R. (% changes of the control). Venous blood samples were collected at 1.3.5.10.15.20.30.60 min. after epidural fentanyl. Plasma concentrations of fentanyl were measured by radio immuno-assay. Data were expressed as mean \pm SD and comparisons were performed using a two-way analysis of variance and t-test, $p < 0.05$ indicated significance. Three patients received I.V. fentanyl (100.50.50 mcg), slowly injected ; we quickly stopped because the pain relief was insufficient. The same data were collected in all cases.

RESULTS

The groups were similar with respect to age, weight and fentanyl doses. The fentanyl is found in plasma from the 1st min. In group I, the plasma peak of plain fentanyl was achieved at 5 min. Fentanyl plasma levels distribute like intramuscular injections (1). In group II fentanyl plasma levels distribute like continuous intravenous infusion (1). Fentanyl plasma levels (fig. 1) were significantly higher in group I, except at 30 min. The results of S.P.R. show, an very quick onset (5-7 min.), an analgesia lasting significantly longer in group II ($p < 0.02$). The sedative and anxiolytic effects (n 19) is present during all the study. There is no relation between the fentanyl doses, the plasma levels and the S.P.R. scores. In group I, in three cases, with plasma fentanyl levels > 1 ng.ml a slightly decreased beat to beat (duration 15 min.), on the fetal heart monitoring, is observed ; and the patient is drowsy and dizzy.

In the I.V. cases, peak fentanyl levels (2.2 ng.ml) occurred at 1-2 min, at 30 min the I.V. plasma fentanyl levels is lower than levels of the groups I and II ; for the pain relief, the onset is quick (2 min.), the maximum changes (S.P.R. 80-100 %) at 10 min., it ended at 20 min., dizziness and drowsiness appear quickly, and ended at 10 min.

DISCUSSION

This study demonstrates that, when epinephrine is added to epidural fentanyl, the plasma fentanyl levels are low and that it does not improve analgesia quality but it may prolongue its duration.

Plasma fentanyl levels > 1 ng, by epidural or I.V. routes, may involve patient dizziness and drowsiness and temporary sedative effects on the fetus. The patient sedative and anxiolytic effects may be systemic effects at low plasma levels.

The pain scores, not correlated to plasma fentanyl levels, and the longer epidural analgesia suggest that epidural fentanyl acts primarily by spinal route.

REFERENCES

- 1.COUSINS M.J. Regional Anaesthesia 1884-1984:120
- 2.JUSTINS DM et al. Anaesthesia 38:937,1983

PLASMA FENTANYL mean \pm S.D. (ng.ml⁻¹)

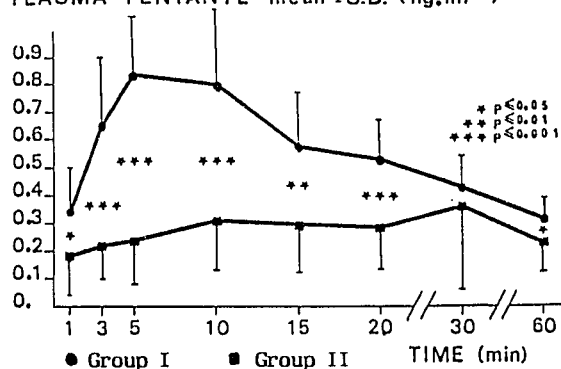


FIGURE 1

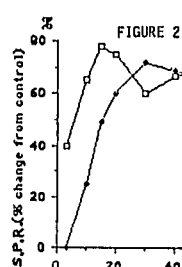


FIGURE 2

TABLE (mean \pm SD)

	GROUP I	GROUP II
n	10	10
AGE (yrs)	29.4 \pm 3.74	29.3 \pm 5.6
WEIGHT (kg)	67.6 \pm 7.1	68.7 \pm 11.1
PAIN SCORE		
- Control	3.8 \pm 2.2	4.9 \pm 1.7
ANALGESIA		
- Onset (min)	7.5 \pm 4.2	5.3 \pm 2.7
- Duration *	68 \pm 5.3	82.2 \pm 17.3
PRURITUS	5	3
SEDATION	9	10
RESP. DEPR.	0	0
V. NAUSEA	0	0