

TITLE: EFFECTS OF EPIDURAL ANESTHESIA DURING LABOR ON MATERNAL PLASMA  $\beta$ -ENDORPHIN LEVELS

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**Introduction.** Endorphin is a generic name for a group of endogenous peptides which bind specifically to the opiate receptors in the brain and trigger opiate-like bioresponses (Endorphin = Endogenous Morphine). Recently a variety of evidence indicates that endorphins are probably new neurotransmitters of specific neural systems in the brain that mediate integration of sensory information pertaining to pain and emotional behavior (1). It was shown that mechanically and chemically induced stresses increase the release of endorphins in rodents and subprimates. The purpose of the present study is to evaluate the effects of labor pain and epidural analgesia on plasma  $\beta$ -endorphin ( $\beta$ -EP) in the human parturient.

**Methods.** The study was approved by the Human Research Committee and informed consents were obtained. Samples of plasma were collected from 13 patients prior to and after complete onset of epidural anesthesia, and from 10 patients prior to and after injection of saline into the epidural space as part of the loss of resistance technique, but before injection of the local anesthetic; the latter group served as a control group. Blood samples were also obtained from 10 healthy non-pregnant female volunteers for comparison. Plasma  $\beta$ -EP was measured using radioimmunoassay after silicic acid extraction and gel chromatography.

**Results.** Table 1 shows the  $\beta$ -EP levels found in our samples. The plasma of non-pregnant women had  $\beta$ -EP levels of  $11.3 \pm 1.5$  (mean  $\pm$  SE) femtomoles/ml as compared to  $54.5 \pm 9.0$  for pregnant women in labor ( $p < 0.001$ ). After epidural anesthesia, plasma

$\beta$ -EP levels dropped significantly from  $54.5 \pm 9.0$  to  $28.2 \pm 3.5$  ( $p < 0.005$ ). There were no changes in the  $\beta$ -EP levels in the control group before and after injection of saline into the epidural space.

**Discussion.** Results of our study confirm previous finding that pregnant women in labor have higher  $\beta$ -EP levels than non-pregnant women. Our results also indicate that epidural anesthesia is followed by a significant reduction in plasma  $\beta$ -EP levels. These data allow us to conclude that the apparent pain induced rise in  $\beta$ -EP which occurs as labor progresses is reversed by pain relief after epidural anesthesia.

#### Reference.

- Snyder SH and Bennett JP Jr.: Neurotransmitter Receptors in the Brain: Biochemical Identification. *Ann Rev Physiol* 38:153, 1976

TABLE 1.  $\beta$ -EP ENDORPHIN LEVELS (FEMTOMOL/ML), MEANS  $\pm$  SE

NON-PREGNANT GROUP (n = 10)	LABOR EPIDURAL GROUP (n = 13)		LABOR CONTROL GROUP (n = 10)	
	Anesthesia		Saline	
	Before	After	Before	After
$11.3 \pm 1.5^*$	$54.5 \pm 9.0^*$	$28.2 \pm 3.5^\dagger$	$64 \pm 20.5$	$55.8 \pm 13$

\*  $p < 0.001$        $^\dagger p < 0.005$