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Title : MATERNAL ENDOGENOUS CATECHOLAMINES DECREASE DURING LABOR AFTER LUMBAR EPIDURAL ANESTHESIA

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Introduction. In the experimental animal, maternal pain and stress are associated with increased sympathetic nervous system activity, elevated plasma catecholamine concentrations, decreased uterine blood flow, fetal bradycardia, hypoxia, and acidosis.[1-3] A positive correlation exists between elevated plasma norepinephrine and decreased uterine blood flow in the pregnant ewe.[3] In humans, elevated plasma catecholamine levels during labor resulting from maternal anxiety are associated with decreased uterine activity.[4] We report changes in plasma norepinephrine and epinephrine levels after administration of continuous lumbar epidural anesthesia during active labor.

Methods. Approval was obtained from our institutional committee on human research. In 15 patients, before administration of epidural anesthesia and after informed consent was obtained, four samples of blood were drawn from an indwelling plastic intravenous catheter; one each at the height of two consecutive painful contractions, and one each midway between two consecutive contractions. Lumbar epidural anesthesia was administered in the usual manner using local anesthetic without epinephrine. After onset of analgesia, four samples of blood were again drawn in the manner described above. These samples were analyzed for epinephrine and norepinephrine concentrations using a radioenzymatic assay.[5] The results before and after epidural anesthesia, respectively, were calculated.

Results. Before epidural anesthesia, the mean epinephrine blood level was 294 $\pm$ 47 pcg/ml, and the mean norepinephrine level was 866 $\pm$ 134 pcg/ml. After epidural anesthesia, epinephrine levels decreased 55 per cent to 133 $\pm$ 22 pcg/ml ($P < 0.01$). Norepinephrine levels decreased approximately 25 per cent, but this reduction was not statistically significant. For any given patient, during either the pre- or post-epidural period, catecholamine levels were not significantly different at the height of a contraction compared with those occurring between contractions.

Discussion. Lumbar epidural anesthesia during labor reduces maternal epinephrine levels, probably by eliminating the psychological and physical stress[6] associated with painful uterine contractions, or by denervating the adrenal medulla. Whatever the mechanisms, reducing sympathetic nervous system activity should produce beneficial effects on uterine blood flow and the progress of labor.

References

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