Placental blood flow and epidural analgesia during labour in hypertensive pregnancies

R. JOUPPILA, P. JOUPPILA, A. HOLLMÉN, H. VIEROLA, A. KOIVULA

Placental blood flow can be regarded as a good indicator of the fetal safety of an obstetric analgesic method. By using the new intravenous ^{133}Xe-method for quantitative evaluation of intervillous blood flow (IVBF) we have stated that segmental analgesia with 4 ml of 0.5 % bupivacaine did not significantly change the IVBF in normal pregnancies. Epidural analgesia has been recommended by many authors as the obstetric analgesic method of choice in toxaemic pregnancies, especially, because of the sympathetic blockade achieved by it. This has been suggested to be beneficial for the placental perfusion.

In the present study we have evaluated the effect of epidural analgesia on IVBF in labours complicated with essential hypertension of pre-eclampsia. We have also studied the effect of different volumes of the analgesic agent used and thus of the different width of the epidural and the sympathetic blockade on the flow.

Material and methods

The material consists of nine parturients with essential hypertension and 17 with pre-eclampsia. The mean age, parity and gestational weeks were comparable with each others in the different groups. All the labours were induced by amniotomy and oxytocin infusion. The placenta located on the anterior wall of the uterus.

Six mothers with essential hypertension and 11 mothers with pre-eclampsia were given segmental epidural blockade with 4 ml of 0.5 % bupivacaine. The analgesia was started by cervical dilatation of appr. 3 cm. The mothers were lying in a at least 15° left laterally tilted position during the first 30 min after the beginning of analgesia. During this time they received 500 ml of Ringer solution as an iv-infusion. The maternal blood pressure and heart rate were checked every 3 minutes. FHR and uterine contractions were monitored with cardiotocograph.

Three of the mothers with essential hypertension and six with pre-eclampsia received epidural blockade with 10 ml of 0.25 % bupivacaine. The maternal position and management as well as the controls were the same as before.

Placental blood flow was measured with the intravenous ^{133}Xe-method immediately before and 15-20 min after the injection of the analgesic agent. The injection of the isotope was started just after the cessation of an uterine contraction.

Results

The analgesia was good in all cases. The width of the analgesia after 4 ml of 0.5 % bupivacaine was between Th 10 - 12 and that after 10 ml of 0.25 % bupivacaine between Th 10 - L3.

0300-5577/81/0091-0052 $ 2.00

No maternal hypotension (> 25 % fall from the initial blood pressure) was observed in this material. The mean maternal blood pressures before and after analgesia did not differ from each others in any of the groups.

Of the six essential hypertension parturients with the smaller volume of bupivacaine the IVBF improved in three cases as a consequence of the analgesia. Of the three essential hypertension mothers with the larger volume of the analgesic agent the IVBF increased in two cases. The mean values before and after the analgesia did not differ significantly from each others in these patients. The mean percentage change of the IVBF in the hypertensive mothers with smaller volume of bupivacaine was + 6 % (± 30 %) and that in the mothers with larger volume + 41 % (± 55 %). They did not differ significantly from each others.

In the pre-eclamptic parturients the IVBF improved in nine of the 11 cases after the smaller volume of the analgesic agent. The mean IVBF values before and after the analgesia did not differ significantly from each others. The most marked improvement of the IVBF as a concequence of epidural analgesia was seen in the pre-eclamptic patients, who received the larger epidural blockade with 10 ml of 0.25 % bupivacaine. Every patient studied showed an improvement of IVBF except one, in which there was no real change, because that was in the accuracy of the method. The mean IVBF after the analgesia did not, however, significantly differ from the initial mean IVBF. The mean percentage change of the IVBF in the pre-eclamptic mothers with the larger volume of bupivacaine was + 80 % (+ 82), which value did not, however, differ statistically significantly from the corresponding percentage change of IVBF in the pre-eclamptic patients with the smaller epidural blockade (+ 30 % ± 54).

Conclusions

Our results thus support the recommendation that epidural analgesia can be safely administered to pre-eclamptic and hypertensive parturients, too, provided that maternal blood pressure does not significantly fall. The larger segmental blockade (10 ml of 0.25 % bupivacaine) was more advantageous for the placental perfusion than the smaller segmental block (4 ml of 0.5 % bupivacaine). Because of the wide spread of the data a larger study population is, however, needed to establish statistical significance.

P.Jouppila, M.D.
Dept.Obstet. & Gynec.
University of Oulu
SF-90220 Oulu 22 /Finland