

Foeto placental circulation and the meaning of variable decelerations

by

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A series of observations ⁽¹⁾ in 34 selected ⁽²⁾ normal cases showed that the volume of blood flowing from the placental end of the cord cut immediately after delivery of the baby was remarkably constant (mean: 107 ml; range: 90-125 ml). This volume of placental blood is the one available for fetal transfusion when the cord is clamped late ⁽³⁾. These findings support the hypothesis that an optimal ratio between the placental and the fetal blood volume is necessary for normal placental function.

Like a patient connected to a heart-lung machine, the fetus may suffer from severe asphyxia if the placenta is not primed with a suitable volume of blood, or the fetus may bleed into his extra-corporeal placental compartment if fetal output is in excess of input, or finally the fetus may suffer from circulatory overloading if the volume of blood contained in the placenta is trasfered to the baby before delivery, as in many cases of fetal distress ⁽⁴⁾, or after birth, as in cases of late clamping of the cord.

In cases of compression of the cord in utero (cord around the neck, true knot of the cord, etc.), low pressure within the lumen of the umbilical vein and the thinness of its walls expose the vein to partial or total occlusion, while the umbilical arteries are still open. As a consequence, unless there be some protective mechanism, impairment of venous return from the placenta to the fetus without a balanced reduction of umbilical arterial blood flow would quickly lead to trapping of fetal blood in the placenta and to acute anemia of the fetus; this, in turn, might cause fetal death much more rapidly than the asphyxia induced by the altered perfusion of the fetal side of the placenta.

Impaired venous return to the fetus from the placenta has some similarities with the supine hypotensive syndrome of the adult with an abdominal mass. In both cases there is a reduction of venous return to the right heart through the inferior vena cava. In the adult this leads to the activation of the Bainbridge reflex which, in turn, produces bradycardia, reduction of cardiac output and a drop of arterial pressure. In the fetus something very similar to the Bainbridge reflex is probably the origin of the so called «variable decelerations» of fetal heart rate, described as typical of conditions with cord obstruction; furthermore, like in the adult, bradycardia triggered by reduced venous return to the right heart induces a further reduction of fetal cardiac output and of fetal arterial pressure, so that the amount of blood pumped into the placenta is also reduced and a great loss of blood volume from the fetal compartment is prevented.

If this hypothesis is true, then the above mentioned circulatory adjustments

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of the fetus may be interpreted as an emergency life-saving mechanism preventing fetal exsanguination into the placenta; this is obviously obtained at the costs of altered placental perfusion, but the chances are that fetal movements induced by asphyxia will soon relieve the mechanical compression of the umbilical vein.

The mechanism described may not be the only one preventing fetal blood to be trapped in the placenta; however all existing mechanisms must be very active, as intrauterine fetal death secondary to cord obstruction is very rare as compared to the high number of babies born with the cord around the neck.

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Diagnosis of pelvic congestion in the female

by

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The difficulties encountered in the diagnosis of the pelvic congestion-fibrosis syndrome are well known. It is a female disorder with greatest number of subjectives and the least number of objective symptoms (¹). Among the examinations made in these cases phlebography is most widely used although it does not always provide reliable data. Moreover it is sometimes an unsafe intervention, disproportionate to the disease it is supposed to demonstrate.

We have spught to work out new diagnostic techniques which we describe here:
a) study of the acid-base balance of the capillary blood of the uterine cervix;
b) cervico-uterine clearance of ¹³³Xenon; *c)* ultrasonic visualization of the pelvic vessels; *d)* thermographic study of the hypogastric-perineal area.

MATERIALS AND METHOD

The multifarious nature of the investigation did not always allow us to submit each patient to all four diagnostic thecniques.

The study of the acid-base balance of the capillary blood of the uterine cervix was carried out in 56 patients with gynaecological lesions of varied nature. In 37 of these cases the diagnostic was checked on the operating table. Fourteen cases

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