

THE ESTIMATION OF BLOOD FLOW IN THE UMBILICAL VEIN MEASURED BY
THE IMPULSE DOPPLER METHOD

Z. Czajkowski

Department of Pathological Pregnancy and Labour AM Szczecin,
Head: prof. A. Cretti, and the Centre of Ultrasounds, University of
Zagreb, Head: prof. A. Kurjak

The examination was carried out on the group of 149 pregnant women, during their uncomplicated pregnancies between 29th and 42nd week of pregnancy. The fetal weight was estimated by measuring biparietal diameter and an abdominal circumference. Fetal blood flow through the umbilical vein was measured using Doppler Echo Graph SSD - 910 E, produced by Aloka, Japan,

There was highly significant increase of mean value of blood flow in the umbilical vein, from 104,5 ml/min in 29th week of pregnancy to 357,9 ml/min in 41st week of pregnancy. The values of fetal blood flow in umbilical vein correlated with the duration of pregnancy $r = 0,213$, $p < 0,01$. The increase of mean values were particularly strong expressed and statistically significant between 29th and 30th, 30th and 31st, 31st and 32nd and between 34th and 35th week of pregnancy. It was suggested, that the above changes might be explained by haemodynamic changes in these particular periods of pregnancy. Even more expressed and highly significant relations were found between fetal weights and mean values of volume velocity of the blood flow in umbilical vein. There was found an increase from 96,1 ml/min for fetal weight ranging 1000-1500 grams, to 391,4 ml/min for fetal weight exceeding 3500 grams. The correlation coefficient was $0,99$ $p < 0,001$. The performed regression analysis is expressed by following equation: volume velocity = $0,111$ fetal weight - $24,7$ the result is expressed: ml/kg/min/.

It was also found, that mean values of the fetal blood flow, counted for fetal weight, increase during advancing pregnancy, achieving maximal value of 110 ml/kg/min at 37th and 38th week of pregnancy and for fetal weight ranging 2500-3000 grams.

In the cases of pregnancy longer than 38 weeks and fetal weight exceeding 3000 grams, the 10% decrease of fetal blood flow velocity was observed. It was probably caused by decrease of fetal weight gain and regressive changes in the placenta during last weeks of gestation.