LETTER TO THE EDITOR

Doppler flowmetry in preeclampsia,

Bratisl Lek Listy 2009; 110 (7): 432–435

J. Zahumensky in his paper "Doppler flowmetry in preeclampsia", BMJ 2009, 110 (7) reviews the sumarized results of clinical research on Doppler flowmetry in the screening and diagnosis of preeclampsia (1).

Pre-eclampsia and intrauterine growth restriction, which affect 4–10 % of all pregnancies, are the leading cause of premature iatrogenic deliveries and maternal morbidity in developed countries (2). For this reason, significant expenditures are made into supporting basic molecular research of the disease. Until recently most work has focused on abnormal placentation, genetic and epidemiologic factors, as well as treatments aimed at slowing the progresion of disease. In the last few years, however, new discoveries suggest that preeclampsia is in fact related to an imbalance of circulating angiogenic factors resulting in endothelial dysfunction. The implication of this theory is that preeclampsia is primarily a disease of the vascular endothelium. Notable risk factors for preeclampsia include maternal obesity, insulin resistance, hyperlipidemia, hypertension, kidney disease and trombophilias and all may be markers for underlying vascular disease (3).

The vasoconstriction phenomena of the tertiary stem villi is considered responsible for the up river modifications in the normal wave flow velocity of the umbilical artery (UA), with a decrease in the diastolic velocities reflected by an increase in the resistance and impedecance indices. UA Doppler indices correlate with fetal levels of glucose, amino acids and blood gases, and therefore, could be considered a surrogate measurement of the placental functionality (4). The fetus with abnormal UA Doppler is markedly small for gestational age. Thus, Doppler of the UA could be considered a risk-discriminator tool in the management of small for gestational age fetuses. A meta-analysis, including nearly 7000 high risk pregnancies with IUGR has demonstrated a significant improvement in the number of perinatal outcomes, with an overall reduction of 30 % in perinatal mortality (5). The use of doppler in umbilical artery screening in unselected populations does not result in improvements in perinatal outcomes. Broad ranging ultrasound equipment with the ability to measure pulse wave doppler leads to a wide abuse of this method in primary care. The determination of borderline or pathological pressure in fetuses with adequate symetrical growth leads to needless hospitalizations, to wasted and useless treatment (oxyphilin, magnesium, low molecular weight heparin.) to not indicated inductions of labor and a needless increase in percentages of caesarian sections. The increase number of caesarean section should not be accepted because of its many complications not only during the operation, but also in subsequent pregnancies (6).

With a 10 % false-positive rate, uterine Doppler Mean Pulsatility index (mPI) identified 70.6 % of pregnancies that subsequently developed early-onset preeclampsia. The test had a lower detection rate for the late-onset forms of the disease (23.5 %). Maternal history has a low sensitivity in detection of early-onset cases, although it is better at detecting late-onset preeclampsia (2). Combinations of biochemical and ultrasonographic markers improved the performance of predicting early preeclampsia in low-risk populations. The combination of placental protein 13, pregnancy-associated plasma protein A, a disintergin and metalloprotease-12, activin A or inhibin A measured in the first or early second trimester and uterine artery Doppler in second trimester appear promising (sensitivity 60–80 %, specificity >80 %) (7).

The question remains as to the importance of Doppler uterine artery screening in helping to dectect preeclampsia. Meta-analytical studies showing administration of small dosages of acetylsalycit acid in women with abnormal uterine Doppler measurements displayed a reduced risk in the incidence of preeklampsia (RR 0.48), this approach is generally not accepted or recommended (8). There are no simple recommendations as to what approach to take in women with positive screening results.

The main goal of obstetrics in the last century was to decrease maternal and neonatal mortality and eliminate morbity. In accordance with prenatal recommendations, ultrasound screening, obstetrical monitoring, and the fight against infection decreased perinatal mortality in western regions to a minimum and significantly showed the differences between developed and developing regions. At the present time the attention of obstetricians in western regions is turned to minor issues in pregnancy and delivery, such a sexual dysfunction, urinary and anal incontinence, and consequences of unplanned pregnancies (9–12), because a further decrease in perinatal mortality at the present time in some regions (Czech Republic, Skandinavia, and Austria) is not likely possible (13). Figure 1 shows the difference in the incidence of perinatal mortality between the Czech and Slovak Republics.

The differences in data are dependent on two main factors. On the one hand the population and social factors and on the other, the medical factors. In the slovak population there is a relative higher number of gypsies, characterized by a large number of deliveries and a lower use of medical services. The lower use of health services in this population leads to higher perinatal mortality and morbidity. With regards to medical factors, it is important to recognize the excellent centralized care in Czech

Perinatal mortality in Slovak and Czech republic
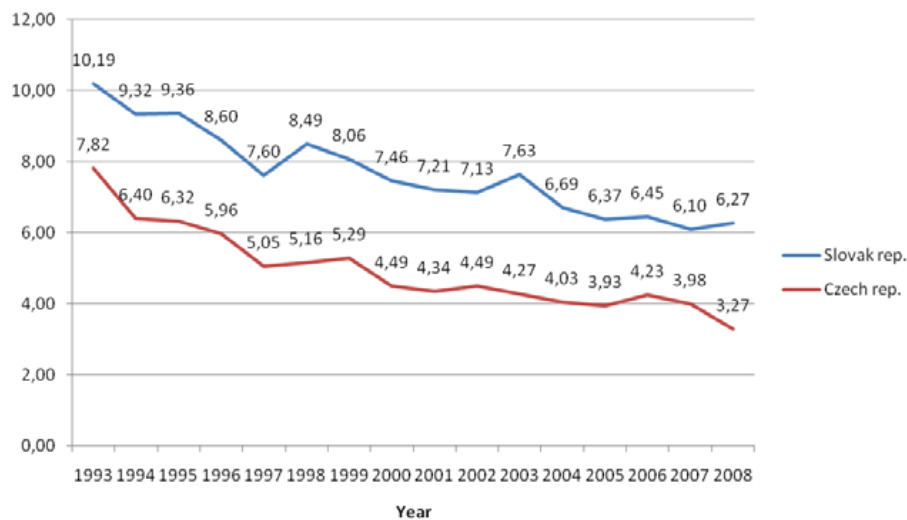
Republic, with more than 90 % of deliveries of children of extremely low birth weight occur in specialized perinatal centers (13). Another factor is to organize better screening of congenital birth defects and better detection, which diminishes the number of newborns with birth defects in perinatal morbidity. In the last place is to gradually deminish the number of small obstetrical departments with less than 400 deliveries per year (approx. 1 per day), where there exists a higher risk based on less experience, training of personel, and also less well equipted. For this reason, it is important to direct our attention and strength toward the good organization of prenatal genetic screening (activity in the first semester) and to increase the percentage of intrauterine transfers of preterm labor. Routine Uterine Artery Doppler screening of preeclampsia at the present day is not on the agenda in the Slovak Republic.

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