

Contribution of Ductus Venosus Doppler in the management of intrauterine growth retardation

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Introduction:

Intrauterine growth retardation (IUGR) is a situation with high fetal and neonatal risk. Together with prematurity it is the most common cause of perinatal morbidity and mortality. Fetal venous Doppler, particularly that of the ductus venosus (DV), has emerged as a useful method to determine the best time for delivery; neither too early to avoid extreme prematurity nor too late, thereby avoiding long term neuropsychological sequelae.

Objective:

To assess the value of the study of Doppler velocimetry spectrum at the ductus venosus in IUGR cases in the prediction of perinatal morbidity and mortality.

Patients and methods:

This is a retrospective study, conducted in our department between 2009 and 2013. About 72 cases of IUGR, due to vascular causes, who have benefited from a study of the Ductus Venosus Doppler.

Results:

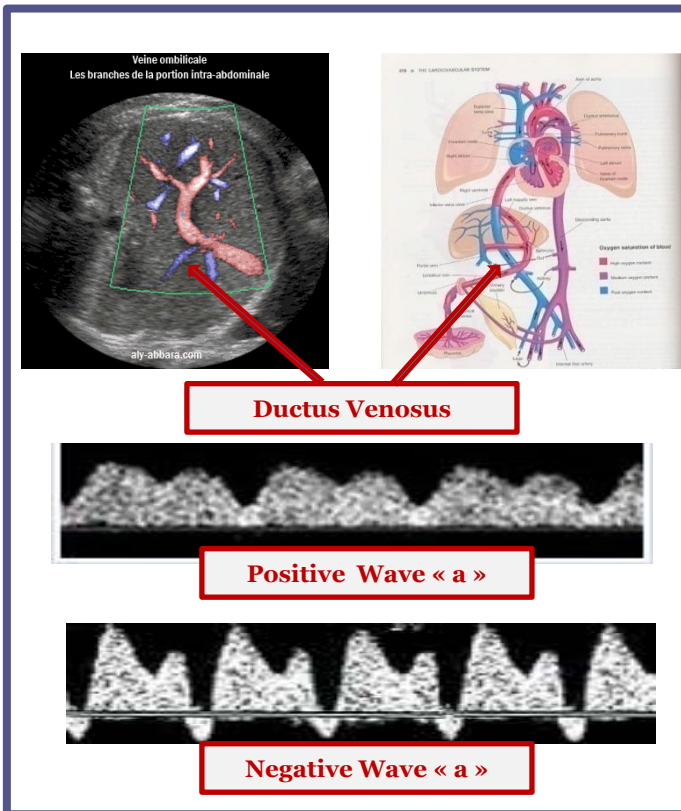
The average parity was 1.7 (57.6% of patients were primiparous). This study is based on **Atrial wave "a"** : positive, nil or negative.

Doppler spectrum of the DV



- Wave "a" : Positive
- Wave "a" : Nil
- Wave "a" : Negative

- ❖ There was no statistically significant difference between the 3 groups for the term of delivery, birth weight, and the values of resistance index of the umbilical, uterine and cerebral arteries.
- ❖ We found no correlation between the severity of IUGR and anomalies of DV Doppler.
- ❖ No statistically significant correlation with the occurrence of neonatal complications. But:
 - a negative wave "a" was statistically correlated with **perinatal asphyxia** ($p = 0.031$), **respiratory distress** ($p = 0.02$), **the recourse to newborn intubation** ($p = 0.026$), **hemodynamic disorders** ($p = 0.002$) and **neonatal mortality** ($p = 0.004$).



Discussion:

It was demonstrated that the cerebral vasodilatation persistent tray reaches approximately two weeks before the onset of late decelerations. Arterial Doppler indexes become useless in the longitudinal follow-up of fetuses with IUGR during those two weeks **hence the usefulness of the study of the ductus venosus Doppler.**

❖ According to **Hecher et al.:**

➢ In the case of moderate hypoxia, there is a redistribution of cerebral circulation while the flow at the ductus venosus remain normal

➢ In case of worsening hypoxia or acidosis, venous indexes become pathological in particular with a negative "a" wave.

❖ According to **Baschat et al:**

A Nil or Negative wave « a » has a good **specificity (94 to 98%)** and a good **negative predictive value (84 to 97%)**. It allows the prediction of acidemia, asphyxia, stillbirth, or died in the neonatal and perinatal period.

However: an abnormal single measure is not always synonymous with acidemia and there is a need to integrate it with other elements.

Hence the interest in combining the use of Doppler indexes of DV with Doppler of the inferior vena cava and the umbilical vein. This improves the prediction of acid-base status and perinatal outcome.

Conclusion:

The prediction of a pejorative neonatal outcome can be improved by combining the Doppler study of venous and arterial network. Thus, Doppler velocimetry of DV must become an integral part of the monitoring of IUGR. Therefore, the measure must be included in the learning objectives of the training specialist obstetrician.