Evaluation of Ductus Venosus Flow

Patient Information Series – What you should know, what you should ask.

What is the ductus venosus?

The **ductus venosus (DV)** is a blood vessel that is only present before birth. It has the shape of a funnel and is situated between the umbilical vein, at the level of the liver, and the baby's heart. It brings blood rich in oxygen from the placenta to the heart and this is further directed to the baby's brain, where oxygen is needed for normal development.

When there is a problem with the baby (there is a chromosomal or heart anomaly or, later in the pregnancy the baby does not grow well) the shape of the ductus venosus (DV) waveform at Doppler examination changes and its measurement becomes abnormal.

An abnormal DV flow in the first trimester of pregnancy is regarded as a marker for possible chromosomal anomalies or heart defects in the baby. Sometimes the DV flow appears abnormal, but there is nothing wrong with the baby. This can also be a temporary finding without significance.

In combination with a first trimester screening test for Down Syndrome (often called a "Combined Test'), the finding of an abnormal DV flow measurement increases the chance that your baby has a problem with the chromosomes greater than the initial risk calculated by the combined test. The doctor will help you interpret the test result. For instance, a risk of 1:100 or greater is usually considered as "high". This means that if 100 women have been given the same risk, only one of them will have a baby with a problem and 99 will not.

Ultimately, the interpretation of risk is highly individual, and only you can decide which risk is acceptable for you and whether you wish to follow up a high risk at a screening test with a confirmatory, diagnostic test such as taking a small sample from the placenta or some amniotic fluid from around the baby (chorion villous sampling/amniocentesis) and analyse the chromosomes.

Should I have the non-invasive test (NIPT) done?

Your doctor will advise you if you qualify for the NIPT or rather should consider having an invasive test such as amniocentesis.

How are chromosomes relevant to an abnormal ductus venosus flow?

Chromosomes are where most of our genetic information is kept. We usually have 46 of them matched in pairs: 23 come from one parent and the other 23 come from the other parent. For example, people with Down syndrome have an extra chromosome number 21. Babies with a chromosomal anomaly, usually an extra chromosome 21 or 18, or 13, often show a thickened NT and/or sometimes show an abnormal DV flow. This can also happen when the baby has a heart anomaly, even if the chromosomes are normal.

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Should I have more tests done?

If the result of the diagnostic test is normal, the doctor will probably suggest an **advanced fetal scan** to analyse all the fetal structures, with special attention to the heart, to check if this is normal.

What are the things to watch for during the pregnancy?

If the tests are all negative (chromosomes and scan of the heart of the baby) it means that no problems have been found with your baby and your pregnancy can be considered normal, so you do not need any further special care in pregnancy. The ductus venosus flow will also become normal at a later stage in pregnancy and the explanation for the fact that it was abnormal early in pregnancy is not clear.

Will it happen again?

Usually, an abnormal DV flow will not be seen again in the next pregnancy, but if the baby had a chromosomal anomaly or a heart anomaly the risk may be slightly increased in your next pregnancy.

What other questions should I ask?

- What is the chance of my baby having a chromosomal anomaly if there was an abnormal DV flow?
- Can I have a combined test done and get my baby's risk of having a chromosomal anomaly?
- Do I qualify for a non-invasive blood test?
- If the risk is high, which invasive test should I choose (chorion villous sampling or amniocentesis)?
- Which risks are associated with these tests?
- Which genetic investigations will be performed?
- Will these tests diagnose small genetic problems?
- Will the doctor organise extra specialised scans in the pregnancy to check if the DV flow was associated with a heart problem or other problems?
- If both heart and chromosomes are normal, will the DV flow be checked later in the pregnancy to see if it has normalised?

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