ALCOHOL AND THE DEVELOPING BRAIN

Everybody agrees that each and every single baby in Ireland deserves a good start in life.

One way of providing this is to do everything in our control to ensure a healthy conception and healthy pregnancy for that child. For some children though, their first experience of alcohol will happen in the womb before they even enter this world.

Alcohol really doesn't fit into the equation of a healthy conception or pregnancy –the use of alcohol at key points in reproduction can be very damaging to an unborn baby's development – especially to their little brain.

Reproduction and conception

Even before a baby is conceived, the quality of a father's sperm can be reduced through binge or excessive alcohol use. Drinking large amount of alcohol can reduce a man's fertility; causing impotence reducing libido or affecting sperm quality.

In one study, it was shown that sperm levels and sperm quality were both reduced in men consuming above the recommended alcohol-intake guidelines[i].

Another study has shown that excessive alcohol consumption can change the genetic quality of sperm[ii] and that in animals, these sperm changes can impact on the development of fetus (developing baby)[iii].

Other studies have not shown these effects so we need much further research before definite conclusions can be drawn. The level of consumption associated with risk remains unclear.

As a precaution, men wishing to conceive with their partners may need to be particularly mindful of their alcohol use. It is advised that:

Men trying to conceive with their partner should follow the low-risk drinking guidelines

Pregnancy

Research has also shown that drinking alcohol during pregnancy has a harmful effect on the developing baby. This happens because when an expectant mum drinks alcohol, so too does her unborn child.

Alcohol doesn't just enter into the mother's blood stream; it also crosses the placenta into the developing baby.

What's the harm in this?

Scientists have discovered that while the pregnant mum is able to eliminate alcohol from her own system (because the organs for clearing alcohol from her body are fully matured), the baby's organs are not yet fully developed and cannot break down or clear alcohol from its system. This means that the unborn baby remains exposed to alcohol long after the mother has stopped drinking.

As we have seen, alcohol is a neurotoxin. It can harm the developing baby at-all points during pregnancy - from the moment of conception right through to birth.

The development, 'coding' and 'fine-tuning' of the brain occurs across the full nine months of pregnancy.

Scientists have discovered that:

Alcohol during pregnancy can:

- Disrupt the way the baby's brain develops
- Cause the placenta not to work properly which can slow the baby's growth
- Increases the risk of miscarriage
- Increases the risk of stillbirth
- Increases the chances of the expectant mother going into premature labour
- Makes the baby more prone to developing illness as they grow up

This is why it is so important that alcohol is avoided completely throughout all stages of pregnancy.

If alcohol disrupts the development of the brain, a child may be born with Fetal Alcohol-Spectrum Disorder (FASD), Partial Fetal Alcohol Syndrome, (pFAS), or Alcohol Related Neurodevelopmental Disorder.

These disorders can really impact the child as they pass through life. They may not meet their developmental milestones or they may struggle in school without special assistance. They may also have difficulties socializing and making friends. In some cases, challenging or antisocial behaviors become a difficulty for the child. They may be more likely to misuse alcohol and other drugs leading to increased future risk of their own children developing FASD[iv].

All of these difficulties arise because alcohol prevents or disrupts the development of important mechanics within the brain during pregnancy.

KEY ADVICE

- There is no safe level of alcohol use during pregnancy
- There is no safe time for alcohol use during pregnancy.
- For pregnant women and women planning a pregnancy, the safest approach is to drink no alcohol at-all.
- If an expectant woman has been drinking alcohol during pregnancy, her baby will benefit if she stops drinking alcohol at any point during her pregnancy.

[i] Jensen, T. K., Gottschau, M., Madsen, J. O. B., Andersson, A. M., Lassen, T. H., Skakkebæk, N. E., ... & Jørgensen, N. (2014). Habitual alcohol consumption associated with reduced semen quality and changes in reproductive hormones; a cross-sectional study among 1221 young Danish men. *BMJ open*, *4*(9), e005462.

[ii] Ouko, L. A., Shantikumar, K., Knezovich, J., Haycock, P., Schnugh, D. J., & Ramsay, M. (2009). Effect of Alcohol Consumption on CpG Methylation in the Differentially Methylated Regions of H19 and IG-DMR in Male Gametes—Implications for Fetal Alcohol Spectrum Disorders. *Alcoholism: Clinical and Experimental Research*, *33*(9), 1615-1627.

[iii] Bielawski, D. M., Zaher, F. M., Svinarich, D. M., & Abel, E. L. (2002). Paternal alcohol exposure affects sperm cytosine methyltransferase messenger RNA levels. *Alcoholism: Clinical and Experimental Research*, *26*(3), 347-351.

[iv] O Malley, K.'The Knotted Cord'. Transgenerational Alcohol Related Neurodevelopmental Disorder (ARND)