Foetal Alcohol Spectrum Disorder

What Are FAS And FASD?
It appears that the first medical investigation of alcohol consumption in pregnancy took place in 1899. It found an increased rate of still birth and infant death amongst the children of alcoholic women (Sullivan, 1899). Much research has since been undertaken, particularly in the USA and Canada, with the research now using the latest brain scanning techniques.

FASD is Foetal Alcohol Spectrum Disorder. It is an umbrella term which describes the wide range of effects that might be present in an individual who has been exposed to alcohol prenatally. The key word here is Spectrum meaning range. There are various effects which can be behavioural, cognitive, emotional and physical. At the most severe end of this “spectrum of defects” is Foetal Alcohol Syndrome (FAS) (Niccols, 2007, p. 136). FAS is the leading cause of intellectual disability, affecting between 1 and 7 per 1000 live births (Niccols, 2007). The broader category of FASD is estimated to affect between 1% - 5% of the population i.e. 10 to 50 per 1000 (Valenzuela, Morton, Diaz & Topper, 2012).

Foetal Alcohol Syndrome was first described in 1973 when Jones and Smith identified the particular set of facial features which appeared in children whose mothers drank very heavily in pregnancy: short eyelid fissures, flat midface, thin upper lip and a flat or smooth philtrum (groove under the nose). These children also had growth deficiency and behavioural and cognitive impairments (Jones & Smith, 1973).

So whilst an individual with FASD might not have any of the obvious facial features, they may still exhibit the intellectual and or behavioural/emotional problems that are common to the condition. FASD is not always evident at birth - the intellectual or behavioural deficits might only become apparent later on, perhaps when the child starts school (Ministry of Health, 2010).

Can alcohol do harm to the developing brain?

The intellectual or behavioural disabilities mentioned above are broad and imprecise terms. No two people with FASD will have the exact same disabilities and issues and this can make diagnosis difficult. Children with diagnoses of FASD can have:

- brain damage
- birth defects
- poor growth
- developmental delay
- difficulty hearing
- difficulty sleeping
- problems with vision
- difficulty remembering
- a short attention span
- language and speech deficits
- low IQ
- problems with abstract thinking
- poor judgment
- social and behavioural problems
- difficulty forming and maintaining relationships
- characteristic facial features

(Ministry of Health 2010)

How many people in New Zealand have FASD?
The exact number of adults and children with FASD in New Zealand is not known. Many people with FASD will go undiagnosed (Streissguth et al, 1993, cited by Astley et al, 2009). It is often hard to diagnose FASD as the problems associated with it may also be associated with other conditions such as Attention Hyperactivity Disorder and Autism. In New Zealand there is no systematic approach from health and social service professionals in screening for FASD, identification or follow up (Alcohol Healthwatch, 2010).
The incidence of FASD in the USA has previously been estimated to be 1% of all births. However, given that drinking during pregnancy appears to be more common and occurring at higher levels in New Zealand compared with the US, the prevalence of FASD in New Zealand is likely to be even higher (Ho & Jacquierard, 2009). Another report supports this research suggesting that FASD births in New Zealand are between 2 – 5% of all births based on international research (Sellman & Connor, 2009).

There are approximately 60,000 births in New Zealand every year (Statistics New Zealand, 2012). That means that between 1200 and 3000 babies are born with FASD each year in New Zealand, assuming prevalence rates of 2% to 5%.

For accounts of some very brave New Zealand women telling their stories about their children with FASD visit www.youtube.com/watch?v=ZwrwNlaEiI4

How many NZ women drink while pregnant?
The per capita consumption of alcohol in New Zealand has increased 9% over the past 10 years (Statistics NZ, 2008, cited by Sellman & Connor, 2009). Although there has been an increase in consumption by women of all ages, young women are drinking more than ever (Ho & Jacquierard, 2009; Law Commission, 2009).

The recent longitudinal study, Growing Up in New Zealand found that while 65% of women avoided alcohol at some time during their pregnancy, 52% reported avoiding alcohol throughout. This indicates that almost half of NZ women are consuming some alcohol while pregnant (Morton et al, 2010).

This study also found that only 60% of pregnancies were "actively planned" meaning 40% were not. Of course, not all women with unplanned pregnancies drink. However, this is a worrying figure as many women may be exposing their unborn child to alcohol for several weeks without even realising it.

What does alcohol do to the developing brain?
Ethanol is the active ingredient in alcoholic drinks and it can have severe effects on the brain of the developing foetus. Although heavy drinking poses the greatest risk, there is no known safe level below which no damage will occur (Ministry of Health, 2010).

Every drink the mother has during pregnancy is also a drink for her baby. Alcohol passes through the placenta and reaches the same levels in the foetus as in the mother (Ministry of Health, 2010), however with an undeveloped liver a foetus is unable to metabolise it as effectively.

So the alcohol remains in the unborn baby’s system for longer, during which time it has the ability to start doing damage to the vulnerable developing brain (Ministry of Health, 2010). Although the teratogenic physical effects happen in early pregnancy (Riley 2005), other more subtle effects can continue to occur with exposure right up to delivery, as the brain continues to grow and form connections throughout the nine months of pregnancy.

The latest scanning techniques allow researchers to look at the structure and size of the brains of people prenatally exposed to alcohol. A recent US study using Magnetic Resonance Imaging (MRI) confirmed that there was significant difference in the size of many regions in the brain when compared to a control group of healthy individuals. These abnormalities were prevalent across the full spectrum of FASD (Astley et al, 2009).

Alcohol can reduce the size of the developing brain, disrupt its shape, and alter tissue density and symmetry. Such abnormalities have been noted in the cerebellum (motor control, language and cognition), the corpus callosum (the tract that links the two hemispheres of the brain) and the basal ganglia (associated with learning and cognition). Individuals with FASD will often have deficits in learning, language ability and general executive function (Riley & McGee, 2005).

Animal studies (in rodents and primates) also clearly indicate that even moderate pre-natal alcohol exposure can significantly affect brain development (Valenzuela, Morton, Diaz, & Topper, 2012). One mechanism is through lasting adverse effects on the hypothalamic-pituitary-adrenal (HPA) axis, which plays an important role in the stress response system (Fast & Conry, 2009).

Is there a safe limit for alcohol consumption during pregnancy?
The science shows us that safest path to follow must surely be no alcohol in pregnancy or when contemplating pregnancy. Why take the risk? The risk of having an infant affected with FAS or FASD will vary according to the individual. In some cases one or two drinks might potentially damage the baby whereas in others, heavier drinking might have no apparent effect. The problem is that we have no way of knowing our individual risk. This is why the recommendation in most developed countries is that there is no known safe amount of alcohol to drink during pregnancy.

However, damage is more likely to occur if high amounts of alcohol are consumed. The relationship between alcohol consumption and risk is one of dose response, not one where there is a threshold of consumption over which damage to the foetus occurs. Any sort of alcoholic drinks can be damaging during pregnancy and the risk is proportional to the amount consumed. Frequent heavy drinking poses the highest risk. Not all children exposed to prenatal alcohol will be affected or even affected in the same way. A wide range of effects is possible. The level of harm is related to the amount, timing and frequency of alcohol consumed.

Recent UK research showed that even low exposure to alcohol throughout pregnancy was associated with disruption to the HPA (stress hormonal control) and cortisol (stress hormone) secretion in a population based sample of 19 month old toddlers (Oullett-Morin, 2011).
The HPA axis is the mechanism that helps the body remain stable or balanced under physiological or psychological stress.

What about drinking alcohol whilst breastfeeding?
A baby’s brain is still very vulnerable to the effects of alcohol even after birth. The NZ Ministry of Health recommends completely avoiding alcohol whilst breastfeeding, as alcohol is passed to the baby through breast milk. If a mother does drink alcohol, it takes on average almost two hours for her body to get rid of one standard drink (Ministry of Health, 2010).

**FASD in our court system**

People with FASD struggle with social relationships, may be aggressive, hyperactive, impulsive and make poor decisions. So is it more likely that they will end up on the wrong side of the law? Research shows that unfortunately the answer to this question is yes.

Many people with FASD will end up in trouble if they do not have the appropriate support throughout life. In a sample of 253 FASD affected individuals, 60% reported having ever been charged, convicted or in trouble with the authorities, and 42% of adults have been incarcerated for a crime (Streissguth, Barr, Kogan, & Bookstein, 1996). People with FASD are also more likely to be victims of crime (Fast & Conry, 2009).

**Conclusion**

Protection against this leading cause of intellectual disability can only be fully ensured with no alcohol consumption in pregnancy (MOH 2010).

If pregnant women do not consume alcohol there will be no cases of FASD. FASD can be prevented but it cannot be cured. What we can do is ensure that our families and communities understand the risks of alcohol consumption to the unborn and breastfed child. We all have a role in supporting women not to drink whilst they are pregnant.

**Where to go for further information, help or advice?**

- GP or midwife.
- Alcohol & Drug Helpline  - 0800 787 797
- Foetal Alcohol Network NZ - www.fan.org.nz
- ALAC - www.alcohol.org.nz
- Ministry of Health - www.health.org.nz or www.healthed.govt.nz
- www.kidshealth.org.nz

**References**

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