

Alcohol Use and Pregnancy

Effects of Prenatal Exposure to Alcohol

Alcohol is the most widely used teratogen among women of childbearing years, and the consequences of prenatal exposure to alcohol can be life-altering (Best Start, 2002). Alcohol is a neurobehavioural teratogen that causes damage to the brain and can subsequently change behaviour. Additionally, neurobehavioural teratogens can cause central nervous system damage at a lower dose than is necessary to cause any physical malformation for the fetus. As a result, the central nervous system may be damaged, yet the child will not exhibit any physical characteristics of prenatal alcohol exposure.

The five identified outcomes that can occur when a fetus is exposed to a teratogen such as alcohol are:

- miscarriage;
- stillbirth;
- malformations;
- growth deficiency; and
- central nervous system dysfunction.

When a pregnant woman ingests alcohol, her blood alcohol level and the blood level of the fetus are the same within minutes of the alcohol consumption. Alcohol passes directly to the fetus through the placenta. The damage that alcohol causes to the fetus is determined by several factors, such as the amount of alcohol consumed, the timing of alcohol consumption during pregnancy, the pattern of alcohol consumption, and the genetic makeup of the mother and the fetus.

Amount of Alcohol Consumed

- Larger doses of alcohol will have a more detrimental effect on the fetus.
- Drinking smaller amounts of alcohol on a regular basis can also cause damage to the fetus.

Timing of Alcohol Consumption During Pregnancy

- Alcohol can damage the fetus throughout the fetus' entire gestation.
- During the first trimester of pregnancy, exposure to alcohol can cause abnormalities in the physical structure of the fetus.
- During the third trimester, the fetus increases dramatically in length and weight, and exposure to alcohol can impair the growth.
- The brain develops and is vulnerable to damage throughout the entire pregnancy.
- Such damage to the brain can result in behaviour problems and cognitive deficits, the most debilitating of all the effects of prenatal alcohol exposure.
- Damage to the fetus may be linked to heavy alcohol consumption during a particular period of the pregnancy. Whenever a pregnant woman stops drinking alcohol, she improves her health and her child's health.

Pattern of Alcohol Consumption (Regular Consumption; Binge Drinking)

- Babies born to chronic alcoholic women are at greater risk of having Fetal Alcohol Syndrome (FAS); however, babies born to women who regularly binge drink (four or more drinks at a time) may experience Alcohol-Related Neurodevelopmental Disorder (ARND).

Genetic Makeup of Mother and Fetus

- The damage done by alcohol varies for individual mothers and fetuses. For example, if two pregnant women consumed the same amount of alcohol when their fetuses were at the same gestational age, the damage to the two fetuses would not necessarily be the same. This is because individuals (mother and fetus) have different genetic structures and different tolerance levels to alcohol.

Sometimes a woman will be pregnant for a number of weeks **before** realizing it or before confirming the pregnancy.

- During this time, she may have already consumed large quantities of alcohol.
- It is very important for women who are sexually active and who may become pregnant to take precautions to avoid alcohol until they are sure that they are not pregnant.

The damage to the fetus caused by prenatal alcohol exposure may be compounded if the mother:

- has poor nutritional status;
- smokes;
- is in poor health;
- is not accessing medical care for general or prenatal health;
- is under high levels of stress;
- is experiencing untreated mental health problems;
- uses other drugs in addition to alcohol and tobacco;
- has a history of alcohol abuse and is continuing to drink;
- has a history of child sexual abuse; and/or
- already has a child with Fetal Alcohol Spectrum Disorder (FASD).

It is important to address overall maternal health in the prevention of FASD. The mother's health, age, exposure to environmental toxins, and stress caused by factors such as poverty and physical abuse may lead to a poor pregnancy outcome.

Paternal Influence

There is conflicting evidence about the effect of a father's alcohol use on the fetus. Animal and human studies have shown decreased birth weight in the offspring of fathers who consumed alcohol (Little & Sing, 2005; Passaro, Little, Savitz, & Noss, 1998). The viability and motility of the sperm may be affected by alcohol and other drugs. More research is needed to identify associations between paternal alcohol use and birth outcome.

Perhaps the most important influence of the father is the impact that his drinking may have on his partner. Fathers can be encouraged to support their partners in stopping alcohol and drug use before and during pregnancy.

Levels of alcohol use

There is no safe amount of alcohol to drink during pregnancy. The more alcohol a woman drinks, the greater the risk to the developing fetus. Chronic drinking (regularly or daily) and binge drinking (four or more drinks on one or more occasions) are both considered to be high risk factors. As cited by Loock et al. (2005), recent research shows that children born to mothers who consumed as little as one drink per day may have behavioural or learning difficulties (Sood et al., 2001).

There is ongoing debate about the effects of mild to moderate alcohol use during pregnancy; however, there is no known amount of alcohol that can be consumed during pregnancy without affecting the fetus. The safest choice is to advise patients to abstain from alcohol use during pregnancy.

Fetal Alcohol Spectrum Disorder (FASD)

The lifelong effects of alcohol use during pregnancy on the fetus are often devastating. Fetal Alcohol Spectrum Disorder (FASD) is an umbrella term that encompasses a range of physical, cognitive, and behavioural effects that can occur when alcohol is consumed during pregnancy (Public Health Agency of Canada, 2006). These lifelong disabilities can have a major impact on the individual and his or her family.

It is important to understand that even though an individual may not meet all the criteria for a diagnosis of Fetal Alcohol Syndrome (FAS) (a combination of cognitive and physical disabilities present at birth) he or she may still be living with the effects of prenatal exposure to alcohol. Individuals not diagnosed with FAS but who have Partial Fetal Alcohol Syndrome (pFAS), Alcohol-Related Neurodevelopmental Disorder (ARND), or Alcohol-Related Birth Defects (ARBD) also have special needs that may be as severe as in an individual with FAS.

Based on a category system, Health Canada's National Advisory Committee developed *Fetal alcohol spectrum disorder: Canadian guidelines for diagnosis* (Chudley, Conry, Cook, Loock, Rosales & LeBlanc, 2005). The diagnosis of FASD is determined by a multi-disciplinary medical team. It is important to adopt a sensitive and trust building approach with mothers and children affected by FASD.

Fetal Alcohol Syndrome (FAS)

FAS describes individuals with the full syndrome including all of the characteristics needed to define it:

- facial anomalies
 - *i.e., small eye openings; flat thin upper lip; and flattening of philtrum*
- growth delays in at least one of the following ways:
 - *low birth weight*
 - *weight loss not due to poor nutrition*
 - *low weight to height ratio*
- central nervous system abnormalities in at least one of the following areas
 - *small head size at birth*
 - *structural abnormalities in the brain*
 - *poor fine motor skills, poor eye-hand coordination, hearing loss unrelated to injury or illness, or poor gait when walking*

FAS can be diagnosed with or without confirmation of alcohol consumption during pregnancy provided all other characteristics necessary to diagnose FAS are present.

Partial Fetal Alcohol Syndrome (pFAS)

pFAS describes individuals who do not have all of the characteristics necessary to receive a diagnosis of FAS. The following criteria are necessary:

- physician knowledge of alcohol consumption during pregnancy
- some of the facial anomalies that are characteristic of FAS

One of the following three characteristics are necessary:

- growth delays in at least one of the following ways
 - *low birth weight*
 - *weight loss that is not due to poor nutrition*
 - *low weight to height ratio*
- central nervous system abnormalities in at least one of the following areas:
 - *small head size at birth*
 - *structural abnormalities in the brain*
 - *poor fine motor skills, poor eye-hand coordination, hearing loss unrelated to injury or illness, or poor gait when walking*
- a pattern of behaviour or cognitive abnormalities that are not age-appropriate and cannot be explained by heredity or environment alone and may include
 - *poor school performance*
 - *deficits in language (both expression and comprehension) and specific mathematical skills*
 - *poor abstract thinking ability*
 - *poor impulse control*
 - *inability to interpret and respond to social situations*
 - *problems with memory, attention, and judgment*

Alcohol-Related Birth Defects (ARBD)

ARBD describes congenital abnormalities related to the:

- heart
- skeleton
- kidneys
- eyes
- ears

To relate these abnormalities to alcohol, the physician must have knowledge of alcohol consumption during pregnancy.

Alcohol-Related Neurodevelopmental Disorder (ARND)

ARND describes the presence of one or both of the following:

- central nervous system abnormalities in at least one of the following areas:
 - *small head size at birth*
 - *structural abnormalities in the brain*
 - *poor fine motor skills, poor eye-hand coordination, hearing loss unrelated to injury or illness, or poor gait when walking*
- a pattern of behaviour or cognitive abnormalities that are not age-appropriate and cannot be explained by heredity or environment alone and may include:
 - *poor school performance*
 - *deficits in language (both expression and comprehension) and specific mathematical skills*
 - *poor abstract thinking ability*
 - *poor impulse control*
 - *inability to interpret and respond to social situations problems with memory, attention, and judgment*

To relate these abnormalities to alcohol, the physician must have knowledge of alcohol consumption during pregnancy.

More information can be found from *Fetal alcohol spectrum disorder: Canadian guidelines for diagnosis* (2005) at: <http://www.cmaj.ca>.