

Alcohol Use and Abuse in Pregnancy: An Evaluation of the Merits of Screening

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Introduction

The current recommendation from Health Canada is that women abstain completely from alcohol if they are pregnant or are attempting to conceive, as a safe level of alcohol consumption during pregnancy has not been determined (Health Canada, 1996). Maternal alcohol use in the prenatal period is of concern as it may result in Fetal Alcohol Spectrum Disorder (FASD), which represents the most common form of mental retardation and birth defect in Canada (Health Canada, 1996 & 2000). If alcohol is avoided during pregnancy then FASD can be prevented (Health Canada, 2000b). Approximately 16.6% of women who were surveyed in the 1996-1997 National Longitudinal Survey of Children and Youth reported some drinking during pregnancy with regional variation of 24.9% in Quebec and 7.7% in the Atlantic provinces (Health Canada, 2000a). These prevalence values are believed to be underestimates given the stigma associated with prenatal alcohol use (Health Canada, 2000a).

Research into the relationships between alcohol type and frequency of use, gestational age, nutritional status, maternal and fetal genetic susceptibility, and the occurrence of FASD is ongoing with the hope that this will help target prevention activities. Meanwhile, screening for the main explanatory variable in FASD, prenatal alcohol consumption, continues to be inadequate. A recent Canadian survey of health care providers showed that fewer than 50% of providers frequently discussed risks of alcohol use during pregnancy among all women of childbearing age or obtained a detailed history of addictions (Health Canada, 2003). Additionally, fewer than 15% of providers frequently obtain a detailed history of sexual abuse among women of childbearing age, a known risk factor in alcohol use in pregnancy (Astley et al, 2000).

There are suggestions for routine screening programs that can assist physicians both to detect and deter alcohol consumption by pregnant women and to intervene with affected children at an early age (Health Canada, 2000b). Alcohol screening program development is particularly important to psychiatrists because improved diagnosis or clinical suspicion of FASD by referring physicians post-screening may dramatically increase those identified with the diagnosis in psychiatry practices. Psychiatric assessment of patients may benefit from records of alcohol exposure in utero and improve clinical diagnosis and management.

At this time there are no universal programs for screening

for in utero alcohol exposure in Canada, however there are several screening approaches that can be initiated by healthcare professionals including clinical interview, standardized questionnaires, and biochemical tests. An alcohol-screening program could incorporate screening and treatment elements currently available and be applied universally to mothers and babies. It is important to identify all those with disease, therefore, the program or combination of tests should be highly sensitive (i.e., those with disease screen positive) while specificity (i.e., those without disease screen negative) is less important.

Evaluation of the criteria for screening

While screening for alcohol use in pregnancy may have some benefits, it should be carefully evaluated for scientific, medical, economic and ethical merit. This review will use the World Health Organization's (WHO) criteria for health screening programs to briefly evaluate if a screening program for alcohol exposure in pregnancy is warranted (Wilson & Jungner, 1968).

1. Suitable tests should exist.

No single appropriate test has been developed, but the combination of several existing tools could be used in a screening program.

Clinician interview/Self-report - The accuracy of self-reporting of alcohol use during pregnancy in clinician interviews can be highly variable (Chang et al, 1998; Chasnoff, 1989). Self-report depends on both a women responding truthfully and on a clinician asking the question. Women who drink heavily during pregnancy may not admit to alcohol consumption due to guilt, shame, or fear of consequences. Chasnoff (1989) notes that an informal interview of women inquiring about alcohol and drug exposure results in under-reporting, whereas a more formal and organized interview increases reporting five-fold.

Standardized Questionnaires - Standardized questionnaires that are easy to use and quickly administered have been developed including the AUDIT, CAGE, TWEAK, and T-ACE (Bradley et al, 1998; Chang et al, 1998). The TWEAK and T-ACE were found to be sensitive in the prenatal population. However, these tools alone do not accurately identify all mothers and infants at risk. The Alberta Medical Association has published guidelines, 'Recommendations on Prevention', related to FASD, which include the use of standardized questionnaires during pregnancy (see the reprint in this issue).

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Biological Markers —Biological markers may offer an objective assessment of infant exposure to alcohol in utero. There are many biomarkers for alcohol use that have been identified: blood alcohol, alcohol metabolites (e.g., fatty acid ethyl esters), enzyme levels (e.g., gammaglutamyl transferase), and altered proteins (e.g., carbohydrate deficient transferrin) (Bearer, 2001). Recently, the technical potential to assess fatty acid ethyl esters (FAEE) in meconium as a measure of alcohol exposure in utero was described (Bearer et al, 1999). Fatty acid ethyl esters are produced by an enzymatic process involving esterification of alcohol with free fatty acids. Meconium, a neonate's first stool, contains a biological record of the total quantity of prenatal alcohol exposure in the last half of pregnancy. However, it is unclear how timing and type of drinking affects the amount and type of FAEEs in meconium.

In a study of nonalcoholic women who self-reported varying amounts of alcohol use during pregnancy, Bearer et al (1998) analyzed FAEE levels and types in meconium. They found that the sensitivity of FAEE analysis of meconium was 72% and the specificity was 51% in distinguishing the consumption of at least one drink per week in the third trimester. In later studies the author found that levels of FAEE increased in a dose-dependant manner with an increase in maternal self-report of alcohol use (Bearer, 2001). This potential tool for prenatal alcohol exposure is being further evaluated.

2. The disease or condition that is being screened for should be important medically, socially, or economically.

The prevalence of Fetal Alcohol Syndrome in Canada is estimated at 1-3 per 1,000 live births while the prevalence of FASD is estimated to be approximately 10 times higher (Health Canada, 1996, 2000b). Secondary disabilities of FASD may include mental health problems, disruptive school experience, alcohol and drug addiction, criminal behavior, and inappropriate sexual behavior (Streissguth et al, 1990 and 1991). The estimated cost for additional education, disability payments, incarceration, and health care per individual with FASD is as high as \$3.0 million over their lifetime (Alberta Health, 2000). In Alberta, up to 29% of children in government care and 60% of the prison population suffer from the effects of FASD (Alberta Health, 2000).

3. The natural history of the disease should be understood and the population at risk should be identifiable.

The natural history of FASD is fairly well understood, however more work is required to identify the role of genetics, diet, and type and frequency of alcohol use.

Alcohol is a teratogen which disrupts normal development in offspring through exposure during pregnancy. The specific body system affected and the long-term outcome seems to depend on when the exposure occurs. No single type of CNS damage has been identified that characterizes FASD and the association between exposure and outcome is dependent on a host of factors including genetic and maternal characteristics, diet, patterns of alcohol use, genetic susceptibility, and maternal lifestyle. Neurobehavioral deficits associated with alcohol exposure may result from drinking at any time during pregnancy.

There are reports that indicate that women who engage in

binge drinking during pregnancy are more likely to smoke cigarettes, have a history of sexual abuse and addictions, be in a relationship with a heavy drinker, and be young and single (Gladstone et al, 1997). Other studies found that as maternal age and parity increase, the risk of FASD increases (Jacobson et al, 1996). No clear and consistent risk factors for FASD, with the exception of prenatal alcohol use, have been identified.

4. The test should be acceptable to the population.

There is insufficient evidence on the acceptability of test methods within the perinatal population and with the clinicians who would be administering them.

The tests described are non-invasive. The factors that may influence acceptability in the population are how a screening program is presented, level of education and knowledge about the program, how test results are used and repercussions for a positive screen. Resources to educate women about testing in the prenatal period and counsel women about a positive test result after birth would have to be in place.

5. The condition should be recognizable at an early stage.

Early identification is possible but challenging. This may be aided by documented alcohol use or exposure.

Currently, FASDs are believed to be under-diagnosed and many children are not diagnosed until schooled; however, FASD can be recognized early, when interventions may be most successful (Sampson et al, 1997; Clarren et al, 2001). Some children may not have the full complement of physical or developmental characteristics of FAS but may have spectrum deficits which are not easily identifiable. Early identification of affected infants is difficult because the characteristic facial dysmorphia may not be evident until school age, if at all (Astley et al, 1995; Clarren et al, 2001).

6. There must be an accepted and effective treatment for the condition.

Two interventions must be considered: interventions to reduce alcohol use during pregnancy and interventions to reduce secondary disabilities in children with FASD.

Brief interventions delivered by a care provider that incorporate elements of counseling, feedback, monitoring of drinking habits, self-efficacy and exercises on counting drinks are effective in reducing prenatal alcohol use (Grant et al, 1996). A recent multi-site pilot study showed that four sessions of motivational interviewing and a contraception counseling session decreased the risk of an alcohol exposed pregnancy in 68% of participants (Ingersoll et al, 2003). These interventions are more successful than simple advice. The more elements of intervention used, the more effective the intervention.

Protective factors that can minimize secondary disabilities include early diagnosis, access to resources, involvement in special education, and a stable and nurturing caregiving environment (Streissguth et al, 1996). Typical interventions include provision of funding for classroom assistants, therapy, and respite care for parents. In many cases the guardian is an adoptive or foster parent who may require access to resources and aid in caring for an affected individual. However, there is only moderate evidence supporting better outcomes and less severe and lower

frequency of secondary disabilities with early detection of FASD. One study of a large sample of children and adults with FAS indicated that those diagnosed before age six had lower rates of secondary disabilities than those diagnosed later (Streissguth et al, 1996). There is a consensus in the literature and among FAS experts that early diagnosis is a protective factor that can minimize secondary disabilities. However, further research on the effectiveness of interventions is required.

7. There should be facilities for assessment, diagnosis, and rehabilitation.

Facilities exist for the assessment, diagnosis, treatment and referral of affected individuals in Centres across Canada. However, these facilities are not able to quickly see all individuals currently identified and care provision is not standardized. Following the implementation of a screening program, the capacity of these facilities would be further strained. Screening at several levels with trained community physicians and paediatricians assessing individuals at risk and referring to clinical FASD specialists would be required. There are Canadian programs to develop capacity and introduce standardization related to assessment, diagnosis, and treatment of FASD.

8. Interventions should be acceptable to the population.

Interventions with women are non-invasive and do not usually involve increased financial costs for the individual. However, there is an increased time-cost for the clinician delivering the intervention. While it is compelling that interventions to decrease alcohol use in pregnant women can be effective, women have identified legal and ethical rights to use alcohol throughout pregnancy, which confounds the acceptance of maternal screening strategies and maternal interventions by the general public and healthcare professionals (Flagler et al, 1998).

Interventions with children may be less acceptable to the population. Guardians may have concerns related to identification and treatment of affected individuals as FASD may be an undesirable label, even leading some to prefer an alternative diagnosis of attention deficit or hyperactivity disorder. A diagnosis of FAS identifies a mother as a woman who drank during pregnancy and harmed her child, which has associated social stigma.

9. The cost of screening should not be disproportionate to cost of caring for affected individuals.

The cost of implementing a screening program cannot be adequately addressed within the scope of this review. However, some comments on the nature and magnitude of costs are possible. Many of the questions related to alcohol use are included on several provincial Prenatal Records. The opportunity exists to collect this data from all pregnant women. These standardized forms provide opportunities to counsel women regarding alcohol use and to identify infants potentially at risk for FASD. Currently, the standardized forms are not used in a standardized fashion. Therefore, an initial low cost opportunity includes improved usage of existing forms through clinician training relating to assessment and follow-up of women. However, the cost for universal biomarker screening would be substantial, and as per existing screening programs for newborn hearing deficiency there would be additional costs for follow up evaluation

of patients that screen positive.

Considering that an estimated 60% of individuals in Alberta penal institutions have FASD the potential cost benefits for screening are easily conceptualized (Alberta, 2000). If secondary disabilities related to FASD, including violent crime, were ameliorated by early detection and intervention then a decrease in the number of individuals in prison or care would be expected. This decrease and the accompanying societal savings may offset the cost of a screening program. However, there would be a substantial time lag between inception of a program and evaluation and realization of benefits.

10. Screening programs should be a continuing process.

A screening program for FASD would have to be used universally and become part of ordinary and ongoing care to be effective.

Conclusion

This article briefly reviews the evidence for screening for alcohol use and abuse in the perinatal period using WHO criteria. There is some evidence of the benefits of such a program but limited evidence of the effectiveness of screening tools, interventions, and the current capacity of the health care and mental health systems to deal with individuals identified at risk. This review highlights the importance of using standardized screening methods for alcohol use and abuse during pregnancy and with women of childbearing age. The Canadian Psychiatric Association Practice Profile survey showed that women comprise almost 60% of psychiatry practices, hence there may be a public health benefit for psychiatrists to routinely screen for alcohol use as part of the psychiatric intake process. This screening should also encompass other known risk factors associated with alcohol abuse during pregnancy. Psychiatrists have an important role in the management of high-risk pregnant women, including treatment of the addictions and the management of the often multiple and severe psychiatric conditions. Further research is needed to identify screening methods, respectful, acceptable and effective interventions with mothers, and effective intervention and support programs to help children with FASD who are at risk for secondary disabilities.

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