

Dispelling myths and developing a framework for reducing the risk of alcohol exposed pregnancies

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Abstract

For many years, society has explored and experienced the consequences of substance abuse, however, it may be suggested that substance abuse is related to preceding events and circumstances. Indeed, risk factors and antecedent events related to substance use have been described, and it is conceivable that effective remedies for reducing the impact of the consequences of substance abuse would focus on remediation of these. This paper will present a prevention framework with specific discussion of alcohol-exposed pregnancies. Fetal alcohol spectrum disorder (FASD) is the leading cause of preventable birth defects and mental retardation. FASD is a consequence of alcohol consumption during pregnancy. No safe level of alcohol consumption during pregnancy has been determined. Women most likely to suffer from alcohol dependence, and those least able to refrain from alcohol use during pregnancy, can be identified by numerous risk factors, including a past history of addiction, poor social support, depression, poverty, smoking, housing insecurity and domestic violence.

In considering remedies for reducing the risk of alcohol-exposed pregnancies, it is important to recognize that there will always be a need for high quality intensive interventions for women with identified alcohol problems who are at immediate risk of exposing a fetus to alcohol. Approaching the problem of substance abuse from a community health perspective, however, brings to light the opportunity for primary prevention and the early identification of risk for substance use, and intervention prior to development of substance dependence. This manuscript will use research evidence as a basis for discussing potential strategies to reduce the risk of alcohol abuse among women and to reduce the risk of FASD.

Introduction

For many years, society has explored the consequences of substance abuse and remedies for this substantial health and societal problem. One of the potential consequences of substance abuse is fetal alcohol spectrum disorders (FASD). With an incidence estimated at 9.1 per 1000 live births, FASD represents the most common cause of preventable mental retardation and birth defects in North America (Barr and Streissguth 2001; Health Canada 1996; Sampson et al. 1997; Smitherman 1994). In Canada alone, the annual cost for additional resources for individuals with FASD who are under 21 years of age is estimated at approximately \$344 million (Stade et al. 2006). Thus, FASD represents an important issue in North America, warranting attention and action to improve the probability that infants will be born at optimal health.

FASD is a consequence of exposure to alcohol in the prenatal period. Women who consume alcohol during pregnancy, particularly those with substance abuse issues, increase the probability that they will deliver an infant with FASD. However, substance abuse is often an outcome of the

interaction between preceding events, life circumstances and individual factors. If antecedent events and risk factors could be identified in childhood, adolescence, or during the childbearing years, opportunity exists to reduce the risk of substance use, substance dependence, and alcohol-exposed pregnancies. Based mainly on research around these risk factors, this paper will describe a framework for reducing the risk of alcohol-exposed pregnancies with some consideration of the broader issue of reducing the risk of alcohol dependence in general. By way of background, a brief overview of FASD will be provided before strategies to reduce the risk of alcohol-exposed pregnancies and the risk of alcohol dependence will be discussed.

Fetal Alcohol Spectrum Disorder (FASD)

Prenatal exposure to alcohol can result in abnormalities in facial features, deficiencies in growth and dysfunction in the central nervous system (including irreversible brain damage) leading to physical, mental, behavioural, and/or learning disabilities and individuals who require extensive support and services in the areas of health, social services, education and training, justice, addictions, and family counselling (Koren et al. 2003). Some of the primary disabilities associated with FASD involve neuropsychological impairments including deficits in executive functioning, memory, attention, visual-spatial abilities, cognitive flexibility, as well as language and motor delays (Mattson and Riley 1998; Olson et al. 1998; Rasmussen 2005). These children are at risk of lower IQ, poor academic achievement and learning problems as a consequence of structural and functional brain damage (Streissguth et al. 1994; Streissguth 1997). Due to the cognitive and social impairments of FASD, secondary disabilities are also likely to arise. Secondary disabilities include mental health problems, incarceration and retention in the justice system, confinement, inappropriate sexual behaviors, alcohol and drug abuse, and school incompleteness, all of which may also reduce the likelihood of meaningful employment (Streissguth 1997; Streissguth et al. 2004).

No level of alcohol consumption during pregnancy has yet been determined as safe (Fried and Watkinson 1988; Fried and Watkinson 1990; Gusella and Fried 1984; Jacobson and Jacobson 1999; Streissguth, Barr, and Sampson 1990). Current evidence suggests that heavy drinking creates the greatest risk for FASD, however, the effects of alcohol on fetal development likely depend on the interaction between a number of factors, including timing, frequency and amount of exposure to alcohol, nutritional and health status of the mother, biologic constitution of the mother and fetus, and fetal vulnerability to alcohol (Hicks 2007; Maier and West 2001).

Given that no safe level of alcohol consumption during pregnancy has been determined, the current recommendation in North America is that women abstain from alcohol if they are pregnant or attempting to conceive (Alberta Medical Association 2007; American Academy of Pediatrics--Committee on Substance Abuse and Committee on Children With Disabilities 2000; Astley et al. 2000a; Centers for Disease Control and Prevention 1997; Chudley et al. 2005; Health Canada 1996; Jacobson and Jacobson 1999; United State Department of Health and

Human Services 2000). Indeed, 99% of women in Alberta (a Canadian province) were aware that no alcohol is best during pregnancy (Tough et al. 2006a). Nevertheless, recommendations and knowledge are not sufficient to change alcohol consumption behaviour among women most at risk of an alcohol-exposed pregnancy. Strategies to change alcohol consumption behaviour among these women need to address the complex relationships existing between substance dependence, mental and physical health (including historical trauma), and environmental and social problems. The following sections will examine some underlying myths and assumptions that are important to identify when developing comprehensive strategies to address alcohol consumption during pregnancy.

Myth #1: To prevent FASD, all we need to do is make sure women do not drink when they can become pregnant.

To focus only on the drinking behaviour of women who can become pregnant or are already pregnant, we ignore the complex relationships that have contributed to this behaviour and miss opportunities to intervene earlier. It is analogous to saying that to prevent obesity, all we need to do is treat it when we see it. But the reality is, there are factors that can be modified early on in someone's life to improve their chances of not developing obesity, and the same is true for a substance abuse issue.

Intervene Using Systems that Identify Children At Risk of Later Substance Dependence

To facilitate the responsible use of alcohol and prevent FASD, it is important to determine modifiable antecedents of alcohol abuse and identify opportunities to intervene. Antecedent events to alcohol dependence in women have been well described in the academic and popular press. Women with alcohol dependence often report childhood experiences of an addicted parent, poverty, sexual abuse, child maltreatment, experience with foster care as a child, poor academic achievement, and family chaos as demonstrated in the illustrative story in Figure 1 (Badry et al. 2006; Dube et al. 2002; Grella, Hser, and Huang 2006). Evidence suggests that the more adverse events a child faces, the higher likelihood he or she will adopt health-risk behaviours, including substance dependence (Dube et al. 2002). This evidence indicates that adverse childhood experiences may be an underlying factor contributing to substance dependence, risky behaviours and adult disease. Misuse of alcohol may arise as a way of coping with challenging experiences as it provides immediate or short-term emotional and social benefits. Such benefits are often more salient than the possibility that excessive, prolonged use may be destructive. The situation is further complicated if the woman herself is a consequence of an alcohol-exposed pregnancy, which would compromise her decision-making ability. Thus, environmental, social, and personal factors that increase the risk of alcohol abuse and dependence can be identified in childhood, and if they are not remediated, increase the probability of alcohol dependence in adulthood and continued use of alcohol in future pregnancies.

Policies and programs that are organized to identify families at risk and intervene early can have a long term positive impact and may reduce the probability that intensive intervention strategies are required at a later time when costs are higher and the probability of success is reduced (Carneiro and Heckman 2004). Population health strategies that range in intensity from universal to targeted may also reduce the stigma associated with obtaining support and improve the probability of success. For instance, one way to support stable attachments for children before contact with the child welfare system is to provide universally accessible positive parenting programs that improve the capacity of all parents to provide children with healthy environments. Other more targeted strategies may help to mitigate risk among families that are identified at higher risk. Evidence suggests that early intervention programs are cost effective and valuable over time with regard to academic achievement and reduced probability of incarceration (Campbell et al. 2002; Carneiro and Heckman 2004; Olds 2006). Consequently, active means of identification of children at risk of adverse childhood experiences coupled with evidence informed interventions could reduce the risk of substance dependence. Programs must be of sufficient intensity and duration to allow for development and reinforcement of desired behaviours and should build on existing evidence that indicates children require safety, security and freedom from abuse and neglect in order to optimize growth and development (United Nations General Assembly 1989). Research has confirmed that children benefit from stable attachment to healthy adults, and interventions should seek to provide this stable attachment for children (Shonkoff 2003; United Nations General Assembly 1989).

Children who come into contact with child welfare authorities, or children of parents who have had contact with child welfare as a child, are at higher risk of developing substance abuse issues and can be identified through databases of government ministries. When children are first identified as needing support from people other than the family, intensive and sustained evidence-informed interventions can provide these children with the supportive environments that may help them become adults who do not abuse substances. This early intervention may include implementing programs to improve family functioning and provide the necessary support for the child's development (i.e. training and supporting families in parenting), programs that help parents overcome substance dependence issues, and/or social programs that help parents meet their basic needs (e.g. adequate financial support, employment skills training). Interventions may also focus on providing support to the children of substance-abusing parents to prevent substance abuse from arising in their future although research on the effectiveness of this approach is needed. When evidence-informed interventions are implemented, they should continue until child-centred outcomes are achieved, and the intensity of the intervention should escalate until the health and well being of the child is secured.

Where children are not able to continue living with their families and out of home care becomes necessary, stable and supportive foster/adoptive families and communities may provide opportunities to improve developmental and life course trajectory. These families may be aided

in providing optimal environments through training, respite support, adequate remuneration and vigilant monitoring of quality of care. With adequate family and community support, children who face adverse childhood circumstances may be more likely to become adults without substance abuse issues who can nurture and support the development of their own children (Streissguth 1997). However, there is a lack of solid research evidence on how foster care and other out-of-home placement strategies can provide effective support to these children (Donkoh, Underhill, and Montgomery 2006; MacDonald and Turner 2008; MacDonald, Turner, and Dennis 2007).

Intervene Using Systems that Identify Women At Risk of an Alcohol Exposed Pregnancy

In adulthood, women who are dependent on alcohol are more likely to be unmarried, have less than a high school education, experience poverty and unemployment, have a partner that uses substances, have poor social networks, experience domestic violence, and experience health problems, including poor nutrition, smoking, and drug abuse (Alberta Alcohol and Drug Abuse Commission 2006; Astley et al. 2000a; Astley et al. 2000b; Badry et al. 2006). More than half of a group of women in treatment for substance dependence in Alberta, Canada, had been arrested on alcohol-related charges, had mental health problems in the past month, and been involved with child protection in the past three years (Badry et al. 2006). About a third had been hospitalized due to alcohol (Badry et al. 2006).

Considering this, women at risk of alcohol use and misuse during pregnancy can be identified in the preconception and prenatal periods, in part by their interaction with the social welfare, justice or health system. Intervention efforts could be integrated into these systems to minimize the risk of an alcohol-exposed pregnancy and optimize fetal health. Also, women who deal with a myriad of issues, and in particular domestic violence, are more likely to resume substance use after treatment (Mills 2007). This indicates that some groups of women may require extra support during and after treatment.

Myth #2: Physicians have all they need to identify women at risk of an alcohol exposed pregnancy

About 85% of women 20 to 44 years of age attended an appointment with a medical doctor in the past year (Statistics Canada 2005). Hence, health care providers are well positioned to identify women at risk of alcohol abuse by eliciting a history of domestic violence, abuse, foster care, depression or other mental illness, alcohol/drug use, and social support. However, physicians often do not include these topics in discussion with patients. In 2001/02, less than 15% of Canadian physicians frequently obtained a history of sexual or emotional abuse from female patients of childbearing age (Tough et al. 2006b). Less than half of Canadian physicians frequently discussed depression and mental health (~40%) or frequently obtained a history of addictions (45%) or family history of alcohol misuse (~25%) (Tough et al. 2006b).

Consequently, opportunities to identify and refer women who would benefit from other services are missed and the opportunity to support women in optimal health is lost.

Support Physicians in Asking Every Women, Every Time

Current physician approaches are inadequate to ensure women at risk of substance dependence are identified. Infrequent discussion of topics that would aid in identification (e.g. a history of domestic violence, abuse, foster care, depression or other mental illness, alcohol/drug use, and social support) likely reflect the lack of physician training with regard to this type of clinical interview, lack of time to conduct such interviews, lack of understanding of the importance of identification of risk and preventive care, and insufficient referral resources once risk is identified (Tough et al. 2005). Furthermore, there is limited compensation provided to physicians for screening. Strategies that train physicians in screening and identification of risk combined with access to referral resources and sufficient compensation may increase the identification and referral for women at risk of an alcohol-exposed pregnancy.

Myth #3: There is enough evidence to implement routine screening for prenatal alcohol exposure.

Some research about the acceptability of screening for prenatal alcohol exposure has been conducted. Surveys completed by 1509 women who had recently delivered an infant indicated that women would be supportive of routine screening and assessment of prenatal exposures provided certain conditions were met (Hicks 2007). Women indicated that they needed to be informed early in pregnancy that screening for alcohol use in pregnancy would occur and that all women who desired support or assistance in cessation would obtain it. In addition, women indicated that the screening should be universal so as to be non-discriminatory (Hicks 2007). Women also indicated that if an infant was identified as having had prenatal exposure, it was important that both the woman and child would receive *effective* help and that the screening would not be used to rationalize separation of mother and infant (Hicks 2007). The characteristics of women who were less likely to endorse routine screening included those who were older, had more education, were less likely to report alcohol use during pregnancy and were less likely to see any benefits of a screening program (Hicks 2007). The findings from these women align with the ethics and values outlined in the World Health Organization criteria related to screening programs, which suggest that screening should not be implemented unless effective treatment is available and provided (Hicks et al. 2003; Wilson and Jungner 1968).

Consider The Evidence Needed Before Implementing a Screening Program

When further examined within the World Health Organization guidelines for screening, it can be suggested that FASD meets some of the criteria as it is important medically, socially and economically, and its natural history is fairly well understood (Hicks et al. 2003). However, no single appropriate test has been developed to accurately identify which children will develop FASD after exposure to alcohol during pregnancy, and methods to identify prenatal alcohol

exposure during pregnancy (e.g. clinical interview, standard questionnaire, biological marker) all have some inherent problems. Indeed, there is no gold standard to identify prenatal alcohol exposure during pregnancy (Hicks et al. 2003). It may be suggested that there is a low cost opportunity to support clinical interviews to identify women at risk and to provide supports to both health care providers and women to make use of effective substance abuse intervention services (Hicks et al. 2003).

Although the concept of a universal screening program may be acceptable to women, current systematic reviews suggest there is limited evidence of the effectiveness of many FASD interventions, and the diversity of disability subsequent to prenatal alcohol exposure may reveal that there is no 'standardized' intervention approach (Premji et al. 2007). Of note, early diagnosis, access to resources, involvement in special education and a stable and nurturing care giving environment can minimize secondary disabilities (Streissguth et al. 1996). Interventions for women with substance use issues which include brief interventions, such as motivational interviewing and contraception counseling, have demonstrated some effectiveness (Chang et al. 2005; Grant et al. 2005; Wutzke et al. 2002). Nevertheless, the acceptability of interventions for mothers and children has limited evidence. Implementing a screening program also depends on the capacity and facilities for assessment, diagnosis, and rehabilitation. Although facilities exist in Canada, they are not able to promptly see all individuals currently identified with FASD and care provision is not standardized (Hicks et al. 2003). In summary, current conditions do not yet align with all of the World Health Organization guidelines for ethical and effective implementation of a universal screening program.

Myth #4: A primary focus should be to target women who are pregnant and consuming alcohol

Approximately 50% of pregnant women in Alberta, Canada, reported drinking some alcohol before they realized they were pregnant (Hicks 2007; Tough et al. 2006a). Although three-quarters of these women reported alcohol consumption in amounts that were within the low-risk guidelines for Canada, 22% reported consuming 5 or more drinks on one occasion (binge drinking) prior to pregnancy recognition (Tough et al. 2006a). After recognizing the pregnancy, alcohol consumption was reported at lower rates, comparable to other North American research (18% for any alcohol and 0% for binge drinking) (Health Canada 2003; Tough et al. 2006a; Tsai et al. 2007). However, approximately half of women who consumed alcohol during an unrecognized pregnancy later reported that they did not drink during pregnancy, suggesting that there are different interpretations of what 'drinking during pregnancy' means (Hicks 2007). For about half of women, 'drinking during pregnancy' only seems to mean those who drink alcohol and know they are pregnant.

Although many women adjust their drinking behaviour after discovering they are pregnant, alcohol consumption during an unrecognized pregnancy constitutes a risk for the fetus.

Characteristics of women who reported drinking any alcohol prior to pregnancy recognition were not planning the pregnancy, had a higher income, had not had a prior miscarriage, smoked and were Caucasian. Women who reported binge drinking before recognizing they were pregnant were more likely to have unplanned pregnancies, smoke and have lower self esteem (Naimi et al. 2003; Tough et al. 2006a).

Target Women Before They Are Pregnant or Before They Know They Are Pregnant

The research evidence suggests that widespread health promotion activities are necessary to prevent FASD. Universal strategies designed to advance knowledge about drinking during an unrecognized pregnancy and to support optimal behavior and attitudes are required to reduce the risk of alcohol use during pregnancy. With 85% of women visiting a health care provider annually, one way to identify women who are at risk of an alcohol-exposed pregnancy would be for physicians to administer a brief, standardized alcohol screening tool or a thorough clinical interview at every periodic health exam (Statistics Canada 2005). The value of a thorough clinical interview with or without a standard screening tool would include identification of women potentially at risk because of adverse childhood events and current lifestyle or life circumstances.

Myth #5: Women can interpret inconsistent messages about the adverse impact of alcohol consumption during pregnancy and make a well informed decision.

Inconsistent messages from health governing organizations may contribute to ongoing alcohol consumption during pregnancy and certainly contributes to a great deal of debate on the issue. A recent review of international guidelines suggests variability in recommendations; while some organizations recommend abstinence among women attempting to conceive, some suggest that pregnant women should ‘avoid becoming intoxicated’ (Alberta Medical Association 2007; O’Leary et al. 2007). Furthermore, there is variability in how physicians address and support alcohol abstinence during pregnancy, even when guidelines recommend abstinence. For example, 87% of obstetricians and 93% family physicians across Canada recommend abstinence during pregnancy, suggesting that approximately 10% are not providing clinical recommendations according to national guidelines (Tough et al. 2004). Complicating data interpretation for the development of guidelines and recommendations is a body of research literature that includes alcohol use data that is averaged over time which does not allow for accurate assessment of the impact of alcohol on fetal development. For example, the impact of routine low dose consumption is likely to differ from binge consumption, yet average consumption over time may be equal. Thus, there is limited evidence on the quantity and timing of prenatal alcohol exposure in relationship to fetal and child health outcomes.

Work Towards Developing a Consistent Message

With conflicting messages about alcohol consumption during pregnancy, research could play an important role in clarifying the message. However, to help us understand the impact of varying

patterns of alcohol consumption, research must move beyond the standard data analysis that averages alcohol intake over the entire pregnancy. Accurate and reliable methods to ascertain alcohol intake during pregnancy are also needed as well as a better understanding of the interaction between alcohol intake and maternal physiology. In the meantime, however, what we do know can be shared to inform women that alcohol consumption during pregnancy could lead to FASD for a child. The potential danger of alcohol consumption during pregnancy could be communicated in a number of ways to improve public knowledge. Information could be included with marriage licenses, new home warranties, and at mortgage offices to target those women who are at a stage of life where they may be considering pregnancy and parenting. Also, information could be integrated into the education curriculum, as with the “Better Safe Than Sorry” curriculum kit developed by Dr. Kathy Sulik and collaborators (Sulik and Meeker 2008). Physicians and health care providers also play a crucial role in the prevention of FASD particularly via recommendations regarding alcohol use (Alberta Medical Association 2007; Diekman et al. 2000). It is of utmost importance that a consistent message that no safe level of alcohol consumption during pregnancy has been determined is provided throughout a community.

Other Approaches: Healthy Public Policy

Health promotion policy combines numerous strategies including legislation, taxation and organizational change, to improve the health of the population. With regard to reducing the risk of substance dependence, consideration should be given to further understanding the impact of increasing the legal drinking age and to values associated with alcohol use and misuse. Alcohol labeling has been implemented to inform consumers about potential risks of prenatal alcohol exposure, however, there is little evidence of a meaningful impact (Roberts and Nanson 2000). Indeed, evidence is needed to gain a better understanding of the barriers to activities that support non-use or optimal use of alcohol.

Conclusion

There will always be a need for strategies, support and intervention to assist pregnant women who have an alcohol problem and are at immediate risk of exposing a fetus to alcohol. Yet the evidence suggests that prior to pregnancy, women most at risk of substance dependence can be identified in childhood through early experiences. These children intersect with our support systems suggesting that strategic investments and appropriate allocation of scarce resources is feasible. Further, the impact of early experiences demonstrates the importance of the family environment on life-long health. Consequently investing in ways to identify children and families at risk of adverse experiences, and supporting these children with evidence informed interventions of sufficient intensity and impact to optimize functioning would improve the health of our children and our population.

Although individual action is essential for sustained behaviour change, population and public health strategies may be a component of the solution if we create environments where preferred behaviour is supported, invest in early identification and remediation of environments where children are at risk, and provide appropriate and accessible support across the spectrum of community health to intensive tertiary care. Population health strategies and complementary public policies provide support for people to avoid, avert or overcome the pattern of substance dependence and would facilitate optimal health and well being of children and families.

Figure 1. An Illustrative Story of Antecedent Factors That Contribute to Alcohol Abuse

Why Mary?

Why does Mary drink too much?

Because she is having fun with her friends and feels relief when she drinks.

But why does she need relief?

Because all she is qualified for is a low paying job after she ran away from her third foster home. In the job she has, people treat her poorly and drinking makes her feel less lonely at the end of the day.

But why was she in foster care?

Because her dad abused her and her mother wasn't able to take care of her.

But why did her dad abuse her?

Because when he drank too much, he became aggressive.

But why did he drink so much?

Because he was unemployed and couldn't provide for his family, and was seeking relief from the grief in his life.

But why was he unemployed?

Because he didn't have much education and couldn't find a job.

But why didn't he have much education?

Because he ran away from home when he was 14 and never finished school.

But why did he run away from home?

Because his father hit him and his mom was depressed.

Story based on and modified from:

Federal, Provincial and Territorial Advisory Committee on Population Health for the Meeting of Ministers of Health, Charlottetown, P.E.I., September 1999. 1999. *Toward a Healthy Future: Second Report on the Health of Canadians*. Minister of Public Works and Government Services Canada.

Figure 2. Framework for Reducing Risk of Alcohol Exposed Pregnancies

What Does It Mean That...?	Potential Strategies
Many factors influence substance abuse	<ul style="list-style-type: none"> • Act early on these factors • Act strategically – identify families at risk, support children
Many physicians are not identifying women at risk	<ul style="list-style-type: none"> • Support physicians in asking every woman, every time
There is not enough evidence to implement a screening program	<ul style="list-style-type: none"> • Develop more evidence around the effectiveness of screening tools and interventions
Women often consume alcohol before they know they are pregnant	<ul style="list-style-type: none"> • Identify women at risk for binge drinking during periodic health exams
We do not have consistent messages about the alcohol during pregnancy	<ul style="list-style-type: none"> • Work towards developing a consistent message and sharing what we do know

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