

National guidelines on alcohol use during pregnancy: a dissenting opinion

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In March 2006, *National clinical guidelines for the management of drug use during pregnancy, birth and the early development years of the newborn* were published with the support of the Australian federal, state and territory governments and the New Zealand Government under the guidance of a Steering Committee and “two expert workshops”.¹ These guidelines claim to represent a set of nationally agreed, evidence-based guidelines for use by “all health care practitioners working with pregnant women experiencing a drug or alcohol use problem”, but risk being more controversial than helpful, particularly with regard to the consumption of alcohol for which “an abstinence-based approach is not recommended”.

The guidelines advise that a mother should be informed of the risks, and suggest she “may consider not drinking at all” but, if she chooses to do so, “should have less than seven standard drinks” in any week and “no more than two standard drinks” on any one day, and that, “most importantly, [she] should never become intoxicated”. A standard drink is defined as containing 10 g of alcohol.

Consensus guidelines?

The guidelines are the same as those of the National Health and Medical Research Council (NHMRC) for all pregnant women,² which have generated some controversy within the profession. For example, the Australian Medical Association has urged revision on the basis of “compelling international evidence that mothers who drink even small amounts of alcohol during pregnancy could unwittingly harm their unborn children”.³

There is no international consensus in support of the Australian and New Zealand guidelines. To the contrary, the United States Surgeon General states: “A pregnant woman should not drink alcohol during pregnancy” and, if she has already done so, “should stop in order to minimize further risk”.⁴ The American College of Obstetricians and Gynecologists advises its members: “Women should be dissuaded from alcohol consumption during pregnancy because there is no known safe amount”.⁵ Other US authorities urging abstinence include the Centers for Disease Control and Prevention,⁶ the American Academy of Pediatrics,⁷ the National Institute on Alcohol Abuse and Alcoholism,⁸ the March of Dimes,⁶ and the National Organization on Fetal Alcohol Syndrome.⁶

How much alcohol during pregnancy?

The contentious issue is how much alcohol can be consumed on a regular basis without damaging the unborn baby. No one appears to doubt that binge drinking is harmful, and the reality of fetal alcohol syndrome has been accepted since its description.⁹

Implying that one drink a day (but never on Sundays) is safe rejects abundant literature. North American studies show that one drink may produce a level of alcohol in a woman of 0.02%–0.05%, depending particularly on her weight.^{10,11} As alcohol distributes in body water, the approximate 20% increase in that compartment during pregnancy¹² might dilute the concentration of alcohol, particularly from the second trimester. However, the time of exposure of the fetus might be increased. Elimination of

ABSTRACT

- New national guidelines recommend that women who choose to drink alcohol during pregnancy “should have less than seven standard drinks” in any week and “no more than two standard drinks” on any one day, and that they should never become intoxicated.
- Exposure to alcohol at these recommended levels has been shown to affect brain development and certain behaviours in animals.
- Some longitudinal studies in human children have detected detrimental effects from exposure to low levels of alcohol.
- Normal public health standards for exposure to environmental toxins should be applied for the unborn baby. We do not know what level of alcohol exposure is safe and pregnant women can only be advised to abstain.

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alcohol has been prolonged in guinea pigs,¹³ and amniotic fluid may act as a reservoir.^{14,15} Because the amniotic fluid contains less fat than plasma, the concentration of alcohol will be higher in amniotic fluid than in blood.

If Australian mothers restricted their alcohol intake to 10 g per day they might have lower alcohol concentrations than suggested by the American studies. However, in practice, our serving size is usually generous, with such small quantities of wine being only rarely served in either private or public settings.¹⁶ Serving size of alcoholic drinks has been found to regularly exceed the standard by 70% in urban hotels.¹⁷

Regular exposure to the levels of alcohol attainable by one drink has led to disorganisation of neurones in various regions of the brains of laboratory animals. The function of brain cells,^{18,19} their structure,²⁰ viability,²¹ development²² and ability to migrate,¹⁹ and the behaviour of animals²³ and their response to stress²⁴ have all been shown to be disrupted.

The effects on cognition, learning, behaviour and executive function of human brains exposed to these levels of alcohol have been difficult to quantify because of various confounders, and because of the imprecision of psychological measurement. Nevertheless, a number of longitudinal studies have been concluded in North America. One in Detroit suggested a threshold for fetal toxicity of 0.014% blood alcohol.²⁵ One in Ottawa found no deficits in language comprehension or attentional problems at doses less than 8.8 g of alcohol a day.²⁶ One detected no effects on intelligence in 4-year-olds,²⁷ but another found exposure to as little as one drink a week caused children to be three times more likely to have “delinquent behaviour scores in the clinical range compared with non-exposed children”.²⁸ A long-running study in Seattle has reported adverse neurobehavioural effects at various ages after moderate prenatal exposure to alcohol,^{29,30} while a review of literature by another centre found the results inconsistent.³¹

If the effects of one drink a day are at the threshold for detection, it does not mean one drink is "safe". Conclusions are based on statistical averages, and some babies will be more sensitive than others. In any case, how could it be proved that an individual's potential had been reduced from high to normal?

The best advice?

Because thresholds for toxicity to environmental toxins and food additives are based on group averages, it is normal practice to incorporate a margin of safety when setting a public health standard for an acceptable level of exposure to a particular toxicant. The quantum applied depends on the quality of data and whether they are derived from human or animal sources. A safety factor of 10 is commonly applied to doses of exposure at which no adverse effects can be found within a species. When public health standards are established on the basis of animal studies, another factor of 10 is commonly applied to account for interspecies variation (G Neville, Senior Medical Officer, Environmental Health Unit, Queensland Health, personal communication). According to Australian Government guidelines on acceptable daily intakes of agricultural and veterinary toxins for humans: "The most common safety factor is 100 which takes into account that humans may be 10 times more sensitive to the chemical than experimental animals and that a proportion of the population may be 10 times more sensitive than the average person". If, however, the toxicity database is incomplete or when the "nature of the potential hazards indicate the need for additional caution, a further safety factor of 10 to 20 may be incorporated".³²

Why does this advice not apply to fetal exposure to alcohol? If the threshold for detection of clinical damage in humans is one drink a day, the amount producing "no obvious adverse effects" would be less than that and, whatever that volume proved to be, normal public health standards would suggest a mother be warned to drink at most one tenth of it per day, more likely less than a thousandth!

Ann Streissguth, a foundational researcher on the fetal alcohol syndrome at the University of Washington School of Medicine, Seattle, is quoted in a report as warning that there is no statistical evidence of any "risk-free" level of drinking or any "threshold" level of prenatal alcohol exposure in the context of dose-response analysis.³³

The Australian guidelines state: "An abstinence-based approach is not recommended, in part because it could result in disproportionate anxiety" and "precipitous decisions to terminate a pregnancy".¹ Affected mothers should be persuaded from such decisions with information that many babies show no evidence of damage despite heavy exposure.³⁰ They may be reassured with new knowledge of ways the brain can defend itself, and should be advised to refrain from further risk and permit healing.³⁴ Many mothers of children with fetal alcohol syndrome now complain that no one ever told them about the dangers (E Russell, National Organisation for Foetal Alcohol Syndrome and Related Disorders, personal communication).

The medical profession has a particular responsibility to such mothers, but also a general responsibility to the public. The real answer must lie in better education about the prenatal effects of alcohol. This education should be based on laboratory and clinical evidence, and on accepted public health practice. It should be expressed scientifically. The term "one drink" and the warning that a mother "should never become intoxicated" are as imprecise as the condition itself.

The guidelines devote six pages to appropriate discussion of the effects of cigarettes on the unborn, but only two to alcohol, the most

preventable cause of brain damage in the fetus. They discuss many of the perinatal effects of smoking, but refrain from mentioning similar effects from alcohol, which, for example, is associated with an increased rate of stillbirth, low birthweight and premature delivery.³⁵ The guidelines also do not mention that fetuses of mothers over 30 years of age may have increased vulnerability to alcohol.³⁶

To emphasise that risk is highest in the earlier stages of pregnancy might distract attention from evidence that damage may occur from later exposure. Organogenesis occurs in the first weeks, and disruption may lead to the classic abnormalities of fetal alcohol syndrome, but brain development continues and remains vulnerable to low levels of alcohol exposure.²²

I do not believe that the national guidelines represent national "grassroots" agreement. They appear to be based more on wishful thinking than on evidence. The guiding principle (that up to seven drinks a week will not harm the baby) has no margin for safety. Established public health standards should apply for the newborn baby and its exposure to the environmental toxin, alcohol. We simply do not know what level of exposure is safe. Abstinence is the only advice we can give to pregnant women.

Competing interests

None identified.

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