FASD: Prevention and Nutrition: Commentary on Floyd, Denny and Weber, and Nguyen and Thomas

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Introduction

Fetal alcohol spectrum disorders are preventable, but continue to be manifest nearly four decades after the first article on fetal alcohol syndrome was published in the US.[1] The review article by Floyd et al. summarizes the current status of prevention efforts, setting them in the context of the epidemiology of alcohol use by women of child-bearing age in the US. With regards to research on prevention, Floyd et al. summarize three levels of prevention approaches, provide the results of a 2009 Cochrane systematic review of research between 1966 and 2007 (which could only include four studies of sufficient merit) and then make reference to some recent studies published subsequent to 2007. The review article by Nguyen and Thomas highlights the potential importance of nutritional factors that could influence the expression of fetal alcohol spectrum disorders. Just as nutritional deficiencies may exacerbate FASD, their appropriate nutritional supplementation may mitigate against the harmful effects of prenatal

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alcohol exposure. Here, the preponderance of evidence relies on animal models, with studies involving humans in their nascent stages. Both articles highlight the promise and the challenges of research about this critical problem.

Research and Conclusions

Prevention

Drinking during pregnancy is fairly common, and perhaps even more frequent than the data summarized in the Floyd et al. review. Whereas many of the cited studies rely on queries about alcohol consumption in the month before surveys, Ethen et al. asked 4,088 randomly selected control women (who delivered live born infants without birth defects) from the National Birth Defects Prevention Study about drinking during their entire pregnancy.[2] The work of this group, which was not included in Floyd's review, found that 30.3% of all women had alcohol some time during pregnancy, and 8.3% had binge drinking (defined as 4 or more drinks on one occasion). Indeed, since the Ethen et al. study included only women with live births without birth defects, the prevalence reported by this group may be an underestimate of the true prevalence of prenatal alcohol use since it also increases the risk of spontaneous abortion (miscarriage), fetal death and birth defects. Rigorous research on the prevention of fetal alcohol spectrum disorders is relatively sparse and appears to be concentrated on targeted screening and brief intervention efforts. Floyd et al. identified several areas for future investigation, including the influence of others' beliefs on pregnant women's alcohol consumption, the effect of the pregnant women's own knowledge about the consequences of prenatal alcohol use and the lack of clarity about the impact of light to moderate alcohol use on the exposed fetus.

Nutrition

The research on nutrient supplementation in human clinical populations is limited and has heretofore been largely confined to animal models. Diets low in important nutrients have exacerbated alcohol's *teratogenic* effects in animal offspring, including low birth weight, physical anomalies, and brain damage. Nutrient deficiencies may have both short-term effects, by impacting the rate of alcohol metabolism, as well as longer-term consequences by *epigenetic* changes in fetal gene expression. Nutrient supplementation to reduce alcohol's teratogenicity is a hopeful area for further development. However, conclusions about the impact of nutrient supplementation in humans are premature; the need for translational research cannot be

disputed.

Implications for the development of policy

Both reviews emphasize the “positive” – that knowledge about prevention strategies for FASD has “grown exponentially” and that the potential of nutritional interventions, either during pregnancy or in the individual with FASD, is “promising.” However, the real question to be raised is whether our collective efforts are truly commensurate to address the consequences of a known, preventable cause of birth defects and developmental disabilities. After all, pregnant women continue to consume alcohol at rates similar to those published in 1991.

In general, physicians have been slow to incorporate screening and brief intervention into their practices.[3] Explanations include lack of time, comfort or expertise.[4,5] Such barriers may be exacerbated with regards to women who drink alcohol, because women who are risky drinkers are less likely to be recognized, and therefore treated, despite their greater vulnerability to alcohol’s negative medical consequences.[6,7,8] Although women have had lower rates of alcohol use disorders than men in the past, the gender gap for drinking problems is narrowing.[9,10,11] Moreover, binge drinking is increasingly common among all groups, but its consequences are less well appreciated by patients and providers alike, so that information about this pattern of use is neither disclosed nor obtained.[12,13]

Such potential obstacles may become impassable when prenatal alcohol consumption is being considered. The stigmatization of prenatal alcohol use, especially heavy use, may lead to denial or minimization of actual consumption that may hamper our ability to truly understand its extent and consequences.[14] In addition, the debate on “safe drinking limits” during pregnancy continues.[15] As such, some have chosen to dispute or misunderstand the good intentions that come with the most prudent advice of abstinence from alcohol during pregnancy.[16]

On the other hand, there are instances of innovation that merit mention. Several major findings have come from studies involving screening and brief intervention for prenatal alcohol use. The results show that 1) pregnant women with the highest levels of alcohol use reduce their drinking most after a brief intervention that includes their partners, 2) brief interventions delivered by non-medical professionals in a community setting can lead to increased abstinence and improved outcomes, and 3) dramatic decreases in newborn morbidity and mortality can be realized by consistent maternal screening and brief intervention in an health maintenance organization

using practices that exceeded the ordinary standard of care.[17,18,19]

What else do we need to know so that we can act to eliminate the fetal alcohol spectrum disorders? If we demand perfect, unassailable knowledge, then the resources necessary to obtain the data from well-designed studies are similarly required. Areas of much-needed investigation would then include: 1) establishing the safety (or not) of light to moderate prenatal alcohol use, 2) ascertaining the efficacy of screening and brief intervention for risk drinking women, pregnant or not, 3) identifying and then modifying the sources of personal, professional, and societal ambivalence about prenatal alcohol and other substance use, 4) translating the animal research on nutrient supplements and prenatal alcohol use to human clinical populations, 5) codifying the diagnostic criteria for the consequences of prenatal alcohol exposure in infants, children and adults, and 6) assessing the impact when data-driven, evidence-based changes in individual, professional, and societal behaviour are achieved.

These recommendations do not imply, however, that it is desirable to be complacent until all critics of our current knowledge base are satisfied. Indeed, perfection may be the enemy of the good enough when the well-being of our next generation is at stake.

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