

DISPARITIES IN RISK OF AN ALCOHOL EXPOSED PREGNANCY IN A SAMPLE OF URBAN WOMEN

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ABSTRACT

Background

Despite the U.S. Surgeon's warning on the effects of alcohol on the fetus, a substantial number of women continue to drink during pregnancy. Alcohol use in women is grossly underestimated, making it difficult to determine the prevalence of alcohol-exposed pregnancies. Further, there appear to be significant racial differences in diagnoses of Fetal Alcohol Syndrome in comparison to women's reports of drinking.

Objectives

To assess prevalence of alcohol-exposed pregnancy (AEP) risk in women of childbearing age residing in urban areas.

Methods

A random-digit-dial-survey of 1,882 women age 19-44 years was conducted in 2005 in two metropolitan areas in the Midwest. Multivariate logistic regression controlling for demographics and pregnancy status was conducted with moderate AEP risk versus heavy/binge drinking with AEP as the outcome.

Results

In two Midwest urban areas, we found 22.7% of women age 19-44 years to be at risk for an alcohol-exposed pregnancy. Prevalence of risk among White women was 29%, and for Black women 16.5%. Among pregnant women, a greater percentage of Black women reported heavy and binge drinking, though differences between races were not significant. Controlling for metropolitan area, age, education, race, employment, income, and pregnancy status, age and race were found to be significantly correlated with AEP risk, with White women aged 20-29 at highest risk.

Conclusions

White women are at higher risk for an alcohol-exposed pregnancy when compared to Black women, although this risk profile based on race may change for pregnant women. Awareness of the AEP risk is important in education of women and health care professionals in prevention initiatives designed to recognize and address the risk of an AEP.

Key words: Alcohol exposed pregnancy, random digit dial, prevalence, racial disparities.

Despite the U.S. Surgeon General's warning that drinking alcohol during pregnancy is unsafe¹ and the fact that a safe threshold for alcohol consumption during pregnancy has not been demonstrated to exist either in human or animal studies.²⁻⁵ A substantial portion of women continue to drink during pregnancy (10.1% in 2002) with a significant number engaging in heavy or binge drinking (1.9% each in 2002).⁶ Additionally, 45% of

women report consuming alcohol during the three months before finding out they are pregnant, with 12% having "at risk" (heavy or binge drinking pattern) levels of consumption.^{6,7} Sixty percent of women who report alcohol use during pregnancy did not learn they were pregnant until their fourth week of gestation.⁷ It appears then, that many women drink in the early stages of pregnancy before they know that they are pregnant, placing their infants at risk for the adverse effects of

alcohol during a critical time for organogenesis. Therefore, in 2005, the U.S. Surgeon General issued a second warning recommending that besides pregnant women, those women considering or at risk for pregnancy should abstain from alcohol as well.⁸

Fetal alcohol syndrome (FAS) and fetal alcohol spectrum disorders (FASD) are among the most common birth defects, and are completely preventable. While moderate drinking may lead to many cases of FASD, the majority of the diagnosed cases of FAS are likely due to heavy and binge drinking during pregnancy.⁹ Rates of FAS diagnoses are higher among Blacks (U.S.-born African-Americans as well as immigrants from the Caribbean, Africa, and Europe) than Whites,^{10,11} and higher in areas characterized by low socioeconomic status.¹⁰ However, recent studies indicate that in general, including the months before conception, drinking and binge drinking are more common among White women than Black women, and among higher income individuals versus those who earn less.¹²⁻¹⁵ These findings appear to contradict the reported prevalence of FAS diagnoses. Our overall aim of this research was to illuminate why White women report more preconception drinking but have fewer children diagnosed with FAS.

As there is no cure for fetal alcohol syndrome spectrum disorders (FASD),^{16,17} prevention must be the goal. To help clinicians and public health officials examine primary and secondary preventive strategies, the terms alcohol-exposed pregnancy (AEP) and being at risk for an AEP are defined.¹⁸ An AEP is any pregnancy during which a woman drinks any amount of alcohol at any time. All fertile childbearing-age women are at risk for an AEP if they drink alcohol, are sexually active, and do not use contraception effectively. Preventing an AEP can therefore be accomplished through two mechanisms: engaging in abstinence from alcohol use prior to and during pregnancy, or preventing pregnancy entirely by engaging in effective methods of contraception or abstaining from sexual activity. Importantly, no level of alcohol consumption has been determined as safe during pregnancy and FASD is the foremost preventable birth defect for the newborn.¹⁹

We sought to determine the population-based prevalence of AEP risk in the St. Louis and Kansas City metropolitan areas; population-based

AEP risk prevalence has not previously been assessed. We were also interested in whether AEP risk was higher in Black populations, as the incidence of fetal alcohol syndrome has been reported as five to ten times greater in Black populations than White populations in areas across the United States.^{12,20} In these previous findings, however, income was also a major determinant of FAS prevalence, so it is not clear whether race or income is more predictive or whether income is a proxy for race. Racial disparities in health outcomes and access to health care have long been common in the U.S.,²¹ and this study aims to illuminate disparities in alcohol consumption to better inform efforts to reduce the prevalence of FASD. Other studies have suggested that existing warnings about AEP have been less effective for Black Americans.²² As the risk for FASD increases with alcohol intake²⁰ we sought to determine AEP risk for women who drank any alcohol compared to both moderate drinkers and, heavy or binge drinking. Lastly we sought to identify risk factors for having an AEP.

METHODS

A random-digit-dial telephone survey was conducted of adult, childbearing-age Black and White women (age 19-44) living in the Kansas City and St. Louis metropolitan areas. "Black" and "White" refer to self-reported racial identity. We take "White" to indicate of European descent and "Black" to indicate of African descent. Telephone Contact, Inc. conducted the survey between October and November 2005. Each county included in the survey was over-sampled to achieve comparable numbers of Black and White respondents. A random list of phone numbers was generated. These numbers were called until the interviewer received a refusal or a completed survey, or the quota for that county had been reached. A total of 31,250 calls were made with an overall response rate of 22.6%, yielding an eligible sample size of 2,046. Using standard definitions of the American Association for Public Opinion Research organization,²³ we calculated both a response rate (completers and partial completers divided by all calls completed or partially completed excluding wrong numbers and mechanical problems) and a cooperation rate (completers and partial completers divided by

completers, partial completers and those eligible, but refused). For this computation, subjects screened out as ineligible were considered partial completers. Based upon these definitions, the cooperation rate for the survey was 41.8%.

The survey consisted of a set of questions on demographic characteristics (age, race, education, employment status, income) followed by a set of questions on pregnancy status, contraceptive practices and methods used, and drinking behaviors. The questions asked regarding drinking behaviors were adapted from the CDC's Behavioral Risk Factor Surveillance System (BRFSS). An explanation was provided of what was considered a standard drink followed by asking two additional questions; "On average, about how many drinks do you have in a week?" and "About how many times in the last 30 days have you had 4 or more drinks on one occasion?"

Though subjects were told at the onset of the phone call that the survey was for women age 19-44, 102 subjects later reported an age outside this range. These subjects were removed from the analyses (40 from Kansas City, 62 from St. Louis). When the call was made, the interviewer asked to speak to either a Black or White woman; 46 subjects who later identified themselves as belonging to a different racial group were also removed (26 from Kansas City, 20 from St. Louis). The outcome of interest was risk of an AEP. We considered that women "may become pregnant" if they met all of the following criteria:

1. had never been told by a doctor that they were unable to become pregnant,
2. reported one or more sexual partners in the past four months,
3. did not report that all male partners had a vasectomy, and
4. did not use birth control or used birth control ineffectively.

Birth control methods coded as ineffective were:

1. abstinence,
2. rhythm,
3. male withdrawal,
4. missing two or more pills in past four months if using birth control pill or morning after pill,
5. if using condom or diaphragm, didn't use spermicidal foam or jelly every time, and
6. if using spermicidal foam or jelly, didn't use with condom or diaphragm every time.²⁴

Birth control methods considered effective included use of Depo Provera, Intrauterine Device, Norplant, or Vasectomy/ Sterilization. Each woman was asked if over the past four months when she had sex, did she and/or her partner use birth control. If she answered yes, she was then asked to identify all methods used. If she reported a method of birth control other than the ones listed as effective above, the interviewer was prompted to ask additional questions. For example, if a woman stated that she used birth control pills, the prompt question was asked, "have you missed two or more pills a month?" If the woman said yes she was coded as an ineffective birth control user, a subject who "may become pregnant."

To be at any risk for an AEP, a woman needed to be pregnant or "may become pregnant" and drink any amount of alcohol. As the risk of having a baby affected by alcohol increases with drinking level, three different AEP risk variables were created: the first based on whether a subject answered "yes" to "do you drink beer, wine, mixed drinks, or liquor?", a second risk variable based on moderate drinking (1-6 drinks/week with no binge drinking), and a third risk variable for heavy (>7 drinks/week) or binge drinking (4 drinks or more on one occasion at least once in the last 30 days). The main independent variable was race/ethnicity. Other covariates included group (Kansas City or St. Louis), age (year born), income, employment (full or part time based upon 35 hours as the cutoff), and education (highest level completed). For income, \$40,000 was used as the median income based upon census data for these two cities, with \$20,000 and \$60,000 as upper and lower quartile levels.

To extrapolate survey results into prevalence of AEP risk, data were weighted with numbers derived from 2002 census estimates of Black and White female populations for each county in the study area. The census data uses the age categories 15-19, 20-24, 25-29, 30-34, 35-39, and 40-44; population numbers from the 15-19 category were not used for this sample. We assume the percentage of Black and White women age 20-44 is a good approximation to the percentage of age 19-44 as we would not expect the proportion of 19-year-old women to be any different than the proportion of 20-year-old women in these counties. Prevalence of women at risk for

AEP was computed by race for each county and then weighted by population statistics to achieve prevalence estimates for the St. Louis and Kansas City metropolitan areas. This weighting was necessary because the survey over-sampled Black women. We conducted bivariate analyses to compare Kansas City and St. Louis groups using the chi square statistic. Multivariate logistic regression controlling for age, race, education, group, income, employment, and pregnancy status was conducted with any AEP risk, moderate AEP risk, and heavy/binge drinking AEP risk as the outcomes. The regression model includes the risk assessment based on responses to the ‘any drinking’ question.

It is important to keep in mind, however, that this question elicited a qualitative response about drinking, not a quantitative measure of drinks per week or per month, which the moderate and heavy/binge assessments are based upon. All analyses were conducted using SPSS statistical software.²

RESULTS

There were no significant differences on any of the SES variables between the two sites, however there were several significant differences on SES variables when examined by race. Descriptive population statistics by race are reported for the entire sample in Table 1. In the overall sample, the mean age was 33.2; 50.3% Black; 49.7% White. More Black women (14.1%) were represented in the 20-24 age category when compared to White women (10.2%). The majority of women had at least a high school diploma or GED, with a larger proportion of White women having a college degree. A greater percentage of Black women (63.3%) were employed for more than 35 hours per week compared to White women (55.7%). However, more White women had annual incomes of over \$40,000 compared to Black women.

Prevalence of an AEP was found for three risk levels based on alcohol consumption: women who identify themselves as alcohol drinkers, moderate drinkers, and heavy or binge drinkers.

TABLE 1 Descriptive Characteristics of Study Sample by Race

	Black (n=947) %	White (n=935) %
Kansas City	51.9	49.4
St. Louis	48.1	50.6
Age		
19	1.9	0.9
20-24	14.1	10.2**
25-29	19.6	19.0
30-34	22.4	22.4
35-39	19.7	22.9
40-44	22.2	24.7
Last year of education		
0-11 (less than HS grad)	9.2	5.4**
12 (HS grad)	36.5	17.7**
13-15 (some college/ trade school)	35.1	33.0
16 or more (college degree)	19.2	44.0**
Employed for over 35 hours/week	63.3	55.7**
Income above \$40,000	30.6	68.2**

* $p < 0.01$, ** $p < 0.001$

FIG. 1 Weighted Prevalence (with confidence interval bars) of Alcohol-Exposed Pregnancy Risk Among Urban Women in Two Midwest Metropolitan Cities

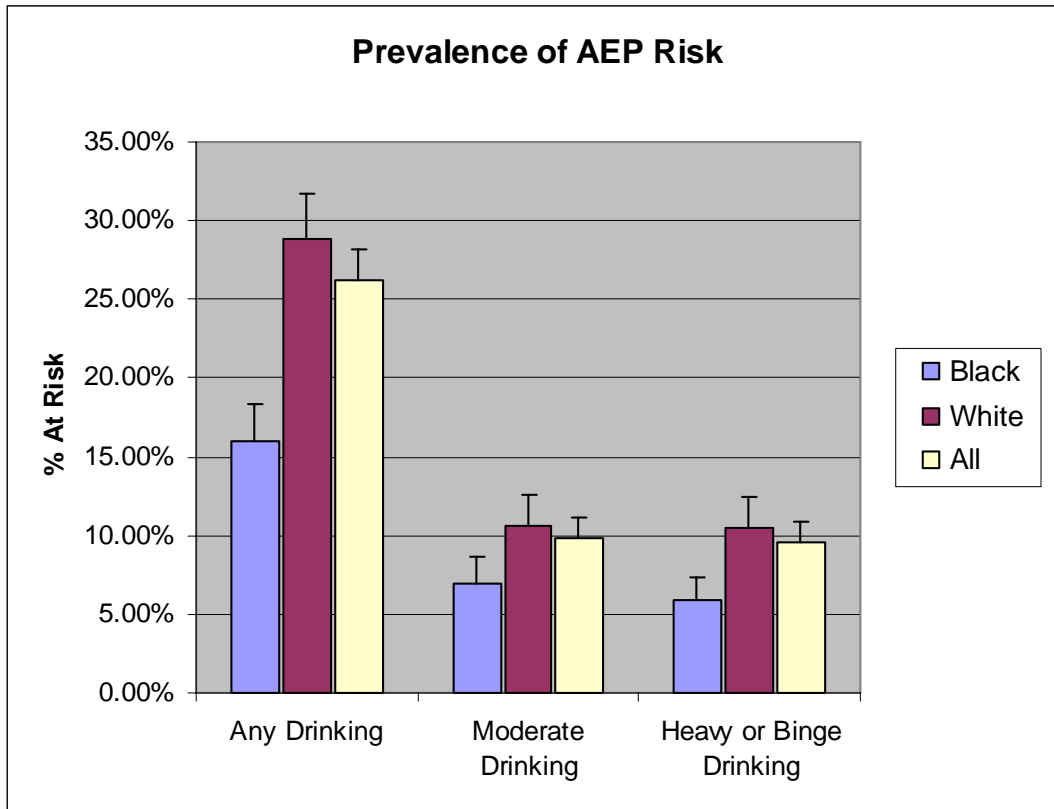


Figure 1 displays prevalence of being at risk for an AEP for the entire sample and for Black versus White women. For any drinking at all, White women reported an almost two-fold higher prevalence when compared to Black women. This pattern of risk is fairly consistent for both moderate and heavy/binge drinking levels as well.

Table 2 shows results from the survey responses and computed AEP risk assessments for subjects in the study. Overall, White women reported considerably higher alcohol use for all three categories of drinking when compared to Black women. Fewer Black than White women reported using birth control (33.3% versus 40.5%), and fewer were coded as using birth control effectively (11.8% versus 17.7%,

respectively). White women, however, were more sexually active when compared with Black women (86.4% and 75.2%, respectively) which resulted in more White women in our sample to be coded as “may become pregnant”. In combination with the increased likelihood of becoming pregnant, we find White women are at higher risk of an AEP. Interestingly, among the pregnant women in our sample, a greater percentage of Black women reported heavy and binge drinking, though the difference between races was not significant. Pregnant White women were twice as likely as pregnant Black women to identify themselves as drinkers (44.8% versus 22.0%, respectively), though this does not necessarily reflect drinking during pregnancy.

TABLE 2 Unweighted Survey Responses and AEP Risk Assessments

	All Women (N=1882)%	95% CI	Black (N=947)%	95% CI	White (N=935)%	95% CI
Yes to "Do you drink?"	54.5	52.2, 56.8	42.3	39.1, 45.5	66.8***	63.8, 69.8
Drinks >0 drinks/week	38.9	36.7, 41.1	30.1	27.2, 33.0	47.6***	44.4, 50.8
Moderate drinker 1-6 drinks/week (no binge)	22.3	20.4, 24.2	18.8	15.9, 21.7	25.8***	22.6, 29.0
Heavy drinker >7 drinks/week	2.9	2.1, 3.7	2.4	1.4, 3.4	3.5	2.3, 4.7
Binge drinks >0 times/month	18.2	16.4, 20.0	13.0	10.8, 15.2	23.6***	20.9, 26.3
Heavy or binge	18.6	16.8, 20.4	13.5	11.3, 15.7	23.7**	21.0, 26.5
Sexually active (past 4 months)	80.8	79.0, 82.6	75.2	72.4, 78.0	86.4***	84.2, 88.6
For sexually active women						
▪ Used birth control over past 4 months	37.2	34.7, 39.7	33.3	29.8, 36.8	40.5**	37.1, 43.9
▪ Used birth control effectively	14.9	13.1, 16.7	11.8	9.4, 14.2	17.7	15.1, 20.3
Currently pregnant	5.4	4.4, 6.4	4.4	3.1, 5.7	6.3	4.7, 7.9
May become pregnant	36.3	32.0, 40.6	33.9	30.9, 36.9	38.8*	35.8, 41.8
Total						
▪ At risk of AEP (any drinking)	22.7	20.8, 24.6	16.5	14.1, 18.9	29.0***	26.1, 31.9
▪ At risk of AEP (moderate drinking)	8.8	7.5, 10.1	6.9	3.3, 6.5	10.7***	8.7, 12.7
▪ At risk of AEP (heavy or binge drinking)	8.2	6.9, 9.5	6.0	4.5, 7.5	10.5***	8.5, 12.4
Non-pregnant women (N=1772)						
▪ At risk of AEP (any drinking)	22.1	20.2, 24.0	16.3	13.9, 18.7	27.9***	25.0, 30.9
▪ At risk of AEP (moderate drinking)	9.0	7.7, 10.3	7.0	5.3, 8.7	11.1***	9.0, 13.2
▪ At risk of AEP (heavy or binge drinking)	8.5	7.2, 9.8	6.0	4.4, 7.6	11.0***	8.9, 13.1
Pregnant women (N=103)						
▪ At risk of AEP (any drinking)	35.4	25.9, 44.9	22.0	9.3, 34.6	44.8*	32.0, 57.6
▪ At risk of AEP (moderate drinking)	5.1	0.8, 9.4	4.9	-1.7, 11.5	5.2	-0.5, 10.9
▪ At risk of AEP (heavy or binge drinking)	4.0	0.1, 7.9	7.3	-0.7, 15.3	1.7	-1.6, 5.1

*p<0.05 **p<0.01 ***p<0.001

Table 3 displays the results of the multivariate logistic regression model. Women aged 20-24 were at highest risk for an alcohol exposed pregnancy for every category of drinking, followed by women ages 25-29. For women categorized as heavy/binge drinkers, age groups

20-24 (**OR=4.8**, CI=2.6-9.1) and 25-29 (**OR=3.4**, CI=1.9-5.9) were significantly correlated with being at risk for an AEP. For women who were moderate drinkers, only the age group 20-24 (**OR=1.8**, CI=1.0-3.1) and being White (**OR=1.5**, CI=1.0-2.2) presented as being significantly

correlated with risk of an AEP, whereas being older (age 35-39), and having more education (high school or more) were protective of an AEP risk. In addition, for women who were heavy or binge drinkers, having less than a high school education (**OR=2.0**, CI=1.0-4.0) and being White (**OR=1.8**, CI=1.2-2.7) were also significantly correlated with risk for an AEP, as well as being

employed for more than 35 hours per week (**OR=1.5**, CI=1.0-2.1). No other correlates of risk met criteria for statistical significance in the multivariate model. Interaction terms were created for age and race, however, these were not found to be significant and were not retained in the final model.

TABLE 3 Logistic Regression to Predict Risk of Alcohol-Exposed Pregnancy for Any, Moderate, and Heavy / Binge Drinking for all Women

Group (STL)	Any Drinking (n=403)			Moderate Drinking (n= 106)			Heavy/Binge Drinking (n=146)		
	n (%)	OR ^a	95%, CI	n (%)	OR ^a	95%, CI	n (%)	OR ^a	95%, CI
Group (STL)	216 (23.2)	1.0	0.8, 1.3	83 (8.9)	1.0	0.7,1.4	77 (8.3)	1.0	0.7,1.5
Age									
19	5 (19.2)	2.3	0.8, 6.5		2.2	0.6, 8.1		3.7	0.8,17.6
20-24	65 (28.4)	2.7***	1.8, 4.1	28 (12.2)	1.8*	1.0, 3.1	34 (14.8)	4.8***	2.6, 9.1
25-29	118 (32.4)	2.6***	1.8, 3.7	35 (9.6)	1.1	0.7, 1.8	46 (12.6)	3.4***	1.9, 5.9
30-34	113 (26.8)	1.8**	1.2, 2.5	46(10.9)	1.2	0.7, 1.9	30 (7.1)	1.8	1.0, 3.3
35-39	54 (13.5)	0.8	0.5, 1.2	15 (3.7)	0.4**	0.2, 0.7	22 (5.5)	1.4	0.7, 2.6
Referent		(1.0)			(1.0)			(1.0)	
Education									
<High School	24 (17.5)	0.7	0.4, 1.1	7(5.1)	0.5	0.2, 1.1	19 (13.9)	2.0*	1.0, 4.0
Diploma/ GED	85 (16.6)	0.7*	0.5, 0.9	35(6.8)	0.5*	0.3, 0.9	28 (5.5)	0.8	0.5,1.4
Some College	153 (23.9)	0.9	0.7, 1.2	52(8.1)	0.7*	0.4, 1.0	60 (9.4)	1.3	0.8,1.9
Referent		(1.0)			(1.0)			(1.0)	
Race									
(White)	269 (28.8)	1.9***	1.5, 2.4	99(10.6)	1.5*	1.0, 2.2	97 (10.4)	1.8**	1.2,2.7
Employed >35 hrs/ wk	267 (23.9)	1.2	0.9, 1.5	104(9.3)	1.1	0.8, 1.5	102 (9.1)	1.5*	1.0,2.1
Income >\$40K	233 (26.4)	1.3	0.9, 1.7	87(9.8)	1.0	0.7, 1.5	81(9.2)	1.3	0.9,2.0
Pregnant (yes)	36 (35.0)	1.7*	1.1, 2.6	103(5.5)	0.5	0.2, 1.2	102(5.5)	0.4	0.1,1.0

OR = odds ratio ; CI =confidence interval

^aAll demographic variables entered into logistic regression model as a single block

*p<.05; **p<.01; ***p<.001

DISCUSSION

This study found that in a sample of 1,882 women, 22.7% were found to be “at risk” for an alcohol-exposed pregnancy when considering any amount of drinking. White women were more likely at risk for having an AEP when compared to Black women at every drinking level, consistent with a study by Naimi and colleagues in their examination of preconception binge drinking¹⁵ and in an examination of binge drinking in the general population in the United States.²⁶ Among the subset of pregnant women in our sample, more White women identified themselves as drinkers. When we examined risk of an AEP across demographic characteristics, we found that younger White women ages 20-29 were at highest risk. However, pregnant Black women reported higher rates of heavy and binge drinking, a result that could explain the disparity in FASD diagnoses. Small numbers of heavy or binge drinking pregnant women in our study, however, meant that we were unable to achieve statistical significance for this finding.

Results of a recent study by Caetano et al, 2006 claim the opposite is true; that binge drinking is more prevalent among pregnant White than pregnant Black, Hispanic, or Asian women.¹² Using data from the 2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), Caetano et al found that being Black, Hispanic, or Asian is protective against heavier drinking while pregnant. However, in their study, “pregnant” meant anyone who had been pregnant at any time in the 12 months prior to taking the survey. To achieve their result, the investigators looked at the overlap between the group of “pregnant” women and the group of women who drank heavily in the past year. Though they point out that 88% of these women reported not drinking at all while pregnant, the investigators did not include this factor in their regression analysis. We still consider these pregnant women to be at risk for an AEP due to drinking they may have done before they knew they were pregnant. Caetano and colleagues did find that for non-pregnant women, those at highest risk for heavy drinking were between the ages of 21 and 29, which is in agreement with our findings.

The findings of our study support previous results from two other studies that examined risk

of having an AEP in clinical samples.^{27,28} While one study focused on characterizing risk of an AEP, the second study examined the use of motivational interviewing as an intervention for reducing drinking and/or increasing effective contraception in women at risk for an AEP. Neither of these studies however, specifically investigated differences in race when comparing any drinking, moderate, and heavy and binge drinking levels. Floyd and colleagues (2002) found that 12.5% of women aged 18-44, met the definition for being “at risk” for an AEP. A second Project CHOICES study was conducted in seven community settings in three large cities in which Ingersoll and colleagues (2003) found a little over 10% who were eligible based upon meeting criteria for being at risk for an AEP. The definition of being at risk for an AEP in both Project CHOICES studies, which were conducted prior to the Surgeon General advice to women who may become pregnant to abstain from any amount of alcohol, specifically examined frequent, heavy or binge drinking plus ineffective or no contraception. Our study also considered AEP risk based on any amount of drinking, given the fact that no safe threshold for alcohol consumption by pregnant women has ever been demonstrated, and many pregnant women drink before they know they are pregnant. In the final regression model, those women who answered ‘yes’ to any drinking were shown to be at risk for having an alcohol-exposed pregnancy. We caution against comparing this qualitative measure directly with the quantitative measures, though we do believe that the prevalence rates computed from the qualitative responses accurately reflect the percentage of women who may have an AEP.

The strength of this study includes the weighted sampling analysis used in the comparisons between Black and White women and in the reporting of three levels of drinking behavior. Previous studies on AEP risk have considered only frequent and heavy/binge drinking. By finding AEP risk based on any drinking, we provide evidence that more women are at risk for an AEP than previously believed.

Limitations

There are limitations to our study. We report results of the logistic regression for all three categories of drinking (any, moderate and

heavy/binge drinking levels), however we feel that results based on the dichotomous yes/no response are uniquely different from those based on the continuous variables for number of drinks per week and number of occasions of binge drinking. The reporting of alcohol use typically underestimates the true prevalence rates, thus future studies may want to ensure that assessments of alcohol use are comparable. Secondly, cell sizes were not sufficient enough to compare differences between pregnant women and non-pregnant women. In addition, we also report that it appears that Black women are less likely to stop drinking during pregnancy when compared to White women. However, due to the number of pregnant women in our sample, further research is needed to determine the strength of this finding.

CONCLUSIONS

The Centers for Disease Control and Prevention (CDC) and the National Task Force on Fetal Alcohol Syndrome and Fetal Alcohol Effect (NTFAS/FAE) recently published guidelines for identifying and referring persons with fetal alcohol syndrome in which they recommend that women who are pregnant, planning a pregnancy, or at risk for pregnancy should not drink any amount of alcohol.²⁹ Based upon these guidelines, the findings of this random-digit dial survey report a two-fold higher prevalence rate for being at risk for an AEP when compared to previous investigations. Prevention of alcohol-exposed pregnancies has been identified as a priority in the US Department of Health and Human Services, Healthy People 2010.³⁰ This priority would suggest that education of women and health care providers need to be updated to reflect these new guidelines to include increased health provider screening to detect AEP risk in childbearing aged women.

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