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The relationship between prenatal care, personal alcohol abuse and alcohol abuse in the home environment

EMILY R. GREKIN and STEVEN J. ONDERSMA

Department of Psychology, Wayne State University, Detroit, MI, USA

Abstract

Aims—Nearly one-fourth of African-American women receive no prenatal care during the first trimester of pregnancy. The aim of the current study is to identify factors that underlie inadequate prenatal care among African-American women. Maternal alcohol abuse has been examined as one risk factor for inadequate prenatal care, but findings have been inconsistent, perhaps because (a) alcohol use during pregnancy is substantially under-reported and (b) studies have not considered the wider social network in which maternal alcohol use takes place. The current study attempts to clarify relationships between personal alcohol use, alcohol use in the home environment, and prenatal care in a sample of post-partum women.

Methods—Participants were 107 low-income, primarily African-American women. All participants completed a computer-based screening which assessed personal and environmental alcohol use, prenatal care and mental health.

Findings—Environmental alcohol use was related to delayed prenatal care while personal alcohol use was not. More specifically, after controlling for demographic variables, the presence of more than three person-episodes of binge drinking in a woman's home environment increased the odds of seriously compromised prenatal care by a factor of seven.

Conclusions—Findings suggest the need to further assess environmental alcohol use and to examine the reliability of personal alcohol use measures.

According to the Centres for Disease Control, 11.2% of pregnant women fail to obtain timely and/or sufficient prenatal care (Martin et al., 2006). Rates of inadequate prenatal care are particularly high among African-American women, 23.5% of whom receive no prenatal care at all during the first trimester of pregnancy, as compared to 11.1% of white women (Martin et al., 2006). Inadequate prenatal care is associated with a variety of adverse foetal outcomes including prematurity, low birthweight, elevated blood lead levels, and infant mortality (Greene, Morello-Frosch, & Shenassa, 2006; Lewis, Mathews, & Heuser, 1996; Murray & Bernfield, 1988; Scholl, Hediger, & Belsky, 1994). In addition, the greater likelihood of inadequate care among African-American women contributes to the comparatively high infant mortality rates in this group (Hessol & Fuentes-Afflick, 2005). Identifying the factors that underlie inadequate prenatal care among African-American women is thus a key step towards the development of interventions to improve infant outcomes within this group.

Although research in this area is limited, several factors have been consistently associated with inadequate prenatal care. One such factor is alcohol abuse. Several studies report that women who use alcohol during pregnancy are significantly more likely than others to begin prenatal care after the fifth month of pregnancy and to obtain an inadequate number of prenatal care visits (Brady, Visscher, Feder, & Burns, 2003; Cherukuri, Minkoff, Feldman, Parekh, & Glass, 1988; Kelly et al., 1999). At the same time, however, other studies have failed to find a relationship between alcohol use and prenatal care after controlling for relevant confounds (Abma & Mott, 1991; Kim et al., 2005). Thus, the degree to which alcohol abuse independently predicts prenatal care remains an open question.

It should also be noted that most alcohol abuse/prenatal care studies fail to consider the broader context in which an individual woman's substance use takes place. In particular, researchers have not explored the effect of environmental alcohol abuse (i.e. alcohol abuse by family and friends in the home environment) on prenatal care utilization. Environmental alcohol use may be related to prenatal care in a number of ways. First, alcohol abuse by family and friends is strongly associated with personal alcohol abuse (Ennett et al., 2006; Feldstein & Miller, 2006; Nation & Heflinger, 2006; Schuckit & Smith, 2006). Thus, it is possible that environmental alcohol use leads to inadequate prenatal care by increasing or exacerbating the effects of personal alcohol use.

Second, substance abusing peers may be less able to provide positive social support to pregnant women (e.g. help with transportation, babysitting for other children, etc). This type of social support has been cited as a factor which greatly increases the likelihood of prenatal care (Higgins, Murray, & Williams, 1994; Mikhail, 1999).

Third, women with alcohol abusing peers may live in environments with poor health behaviour norms. Health behaviour norms (e.g. local attitudes toward smoking, drug use, binge drinking, preventative health care, etc.) have been found to directly affect a variety of individual health-seeking behaviours including regular physician visits and attitudes toward smoking, alcohol use and the consumption of dietary fat (Curry et al., 1993; Prentice, 2006).

The measurement of environmental alcohol use may also have practical consequences. Prenatal alcohol and drug use are substantially under-reported due to the stigma and legal consequences associated with these behaviours (Markovic et al., 2000). This under-reporting may be particularly true among African-American women (National Institute on Drug Abuse, 1996), who are disproportionately likely to be investigated for substance use during pregnancy (Chasnoff, Landress, & Barrett, 1990). In contrast, peer and familial substance use may be disclosed more freely and may, therefore, serve as an indirect indicator of personal substance use problems among pregnant women.

To date, however, no studies have examined the relationship between environmental alcohol abuse and prenatal care. The current study seeks to address this issue by examining relationships between personal alcohol use, environmental alcohol use and prenatal care among a sample of low SES, African-American women. More specifically, we aim to examine whether (a) self-reported personal alcohol abuse or (b) alcohol use by family and friends in the home environment predict the timeliness of prenatal care initiation. The results of this analysis could have significant implications for the identification of women at risk for inadequate prenatal care.

Method

Participants

Participants were 107 women giving birth at an obstetric hospital in Detroit. Participants were almost exclusively African-American (104, or 97.2%) and low income (44, or 41.1% had neither graduated from High School nor received a GED; 98, or 91.6%, had received some form of public assistance in the past year). Ninety-one participants (85%) were single, 8 (7.5%) were married, and 8 (7.5%) were in a long-term monogamous relationship.

Measures

Delayed prenatal care—Participants were asked a single yes/no question regarding whether they had received prenatal care before the third trimester of their pregnancy. A total of 15 participants (14%) indicated that they had received delayed prenatal care.

Personal alcohol use—The alcohol subscale from the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was used to assess participants' alcohol use in the 3 months before they knew they were pregnant (WHO ASSIST Working Group, 2002). Developed by the World Health Organization, the ASSIST was validated on a cross-cultural sample of 1047 adults. Using a structured interview as the gold standard, the ASSIST has demonstrated sensitivity and specificity values of 0.90 and 0.78, respectively, in discriminating between substance use and abuse, and sensitivity and specificity values of 0.82 and 0.72, respectively, in discriminating between abuse and dependence (Newcombe, Humeniuk, Hallet, & Ali, 2003).

Environmental alcohol abuse—Environmental alcohol abuse was calculated by multiplying scores on the following two questions: (a) How many people have had four or more drinks in a row in your home in the past year (1 = 1 person; 2 = 2–3 people; 3 = 4–6 people; 4 = 7–10 people; 5 = >10 people) and (b) How often has this happened in your home in the past year (1 = Less than once per month; 2 = 1–2 times per month; 3 = 3–5 times per month; 4 = 6–9 times per month; 5 = 10–15 times per month; 6 = daily or almost daily).

Procedure

Data for the present study represent baseline evaluations collected as part of a randomized clinical trial. Women were recruited from private hospital rooms in a large obstetric hospital, after giving birth and having slept. Those who expressed interest in the study were checked for preliminary inclusion and exclusion criteria; those who met criteria were asked to provide verbal informed consent for further screening using an audio-enhanced computer-based self-interview (A-CASI). Participants indicating any illicit drug use in the month before pregnancy were asked to provide signed informed consent; all those consenting used the same A-CASI to complete the above measures. Participants were provided with a gift card worth \$30 for provision of baseline data. All procedures were approved by the Wayne State University IRB.

Results

Means and standard deviations of substance use variables are presented in Table 1, and correlations among predictor, control and outcome variables are presented in Table 2. As can be seen in Table 2, delayed prenatal care was associated with environmental alcohol use but not personal alcohol use. Environmental and personal alcohol use were moderately associated with one another.

Two logistic regression analyses were conducted to determine whether either personal or environmental alcohol use predicted delayed prenatal care after controlling for marital status and education level. Potential confounds were entered into the first step of the model and alcohol use variables were entered into the second step of the model. Results revealed that environmental alcohol use significantly predicted delayed prenatal care ($\chi^2 [1, N = 107] = 9.62; p < 0.01$), while personal alcohol use did not ($\chi^2 [1, N = 107] = 1.26; p = 0.26$) (Table 3).

Environmental alcohol use was then dichotomized using an ROC curve to maximize sensitivity and specificity (a cut-off point of 3.5 was chosen). Next, a logistic regression analysis was run predicting delayed prenatal care from the dichotomized version of environmental alcohol use. Odds ratios revealed that women from homes in which there were more than three person-episodes of binge drinking in the past year were seven times less likely to get adequate prenatal care than women whose homes included fewer episodes of binge drinking ($\chi^2 [1, N = 107] = 2.0; p < 0.01$, OR = 7.2, 95% CI = 2.0 – 25.7).

Discussion

A number of this study's findings are noteworthy. Most clearly, alcohol abuse in the home environment may put pregnant, African-American women at risk for inadequate prenatal care. After controlling for demographic variables, the presence of more than three person-episodes of binge drinking in a woman's home environment increased the odds of seriously compromised prenatal care by a factor of seven. Explanations for this finding in terms of health behaviour norms or social support are certainly plausible. For example, women from alcohol abusing environments may lack family and friends who support their healthcare needs by providing transportation, child care, encouragement and a model of healthy behaviours. This may be particularly true in samples, such as the current one, in which 85% of women were single and likely coping with a number of demands on their own. Other factors, such as socioeconomic status and institutionalized racism may also affect prenatal care initiation and clearly warrant further exploration.

This study also adds to the current literature by suggesting that personal alcohol abuse may not contribute to delayed prenatal care. The literature on personal substance use and prenatal care has been inconsistent, with some studies finding positive associations (Brady et al., 2003; Cherukuri et al., 1988; Kelly et al., 1999) and others finding null effects (Abma & Mott, 1991; Kim et al., 2005). Notably, however, this is the first study to explore the role of environmental alcohol use in the propensity to seek prenatal care. Thus, it is quite possible that unmeasured environmental alcohol use has been a driving force behind previously reported positive findings in the alcohol use/prenatal care literature.

Alternatively, it is possible that self-report of personal alcohol abuse is too fraught with risks to function as a reliable predictor in most prenatal care settings. Pregnant women are often extremely reluctant to disclose any type of substance use for fear that they will lose custody of their children or face other legal consequences (Markovic et al., 2000). As a result, self-reported substance use rates often severely underestimate actual substance use rates (Markovic et al., 2000; Shiono et al., 1995). In contrast, pregnant women may be less reluctant to report substance use by family and friends. Peer and familial substance use is strongly associated with personal use (Ennett et al., 2006; Feldstein & Miller, 2006; Nation & Heflinger, 2006; Schuckit & Smith, 2006), but does not carry the same level of stigma or legal consequences. As a result, environmental substance use may serve as an important, indirect indicator of personal substance use during the prenatal period. Results of the current study support this hypothesis. Specifically, environmental alcohol use was widely reported and significantly associated with delayed prenatal care. In contrast, personal alcohol use was

reported infrequently and was unrelated to prenatal care. Future researchers should consider using environmental substance use as a subtle, non-threatening indicator of problematic personal use among pregnant women.

A number of limitations must be noted. First, our findings relied on retrospective reporting of alcohol use. This type of reporting may be unreliable (Johnson, Gerstein, & Rasinski, 1998), particularly when participants are distrustful or defensive, as was likely the case in the current study. Future studies using daily reports or objective measures (e.g. breath alcohol concentration, urinalysis, etc.) may provide more accurate data about the alcohol use/prenatal care relationship. Second, this study assessed only extremely delayed prenatal care (i.e. no care prior to the third trimester). Only 15 of the 107 women in our sample met this criterion and therefore, our analyses may have lacked the power needed to detect significant effects. Nonetheless, that fact that 14% of low income, African-American women in this sample failed to receive adequate prenatal care is significant and results warrant replication with larger samples and different populations.

Third, our sample exhibited limited variability in education and marital status, leading to a somewhat restricted range of variance among our covariates. In addition, we were unable to control for a number of potentially important environmental variables, such as household size and access to transportation. Future research focussing on these variables is needed.

Finally, several of our study constructs (e.g. delayed prenatal care) were assessed with single questions, rather than well-validated scales. It will, therefore, be important to replicate our findings with a more complete dataset.

Despite these limitations, we feel that our results suggest new directions for prenatal care research. Specifically, this exploratory study suggests that alcohol use by family and friends is predictive of delayed prenatal care. Moreover, environmental alcohol use may serve as a subtle, indirect measure of personal substance use. However, these findings are best seen as preliminary given our small sample size and the retrospective nature of our data. Further research using larger samples and prospective data is needed to clarify these intriguing findings.

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Table 1

Descriptive statistics of predictor variables.

	Range	Mean (Standard deviation)
Personal alcohol use	0–16	2.27 (2.8)
Personal marijuana use	0–19	6.57 (6.6)
Environmental alcohol use	0–20	1.66 (1.7)
Environmental drug use	0–30	3.13 (3.1)

Table 2

Product-moment correlations among predictor, control and outcome variables.

Variable	1	2	3	4	5
1. Prenatal care		0.12	0.38*	-0.10	-0.10
2. Personal alcohol			0.31*	0.01	0.09
3. Environmental alcohol				-0.08	-0.15
4. Marital status					0.00.
5. High school graduate (0 = no, 1 = yes)					

Note:

* $p < 0.01$.

Table 3

Logistic regression models of the relationship between substance use and delayed prenatal care.

Predictor	B	S.E.	Wald	df	OR (95% CI)
Education	-0.62	0.57	1.2	1	0.54 (0.1831.6)
Marital status	-0.55	0.57	0.93	1	0.58 (0.1931.7)
Personal alcohol use	0.10	0.09	1.3	1	1.1 (0.9331.3)
Education	-0.28	0.61	0.21	1	0.76 (0.2332.5)
Marital status	-0.53	0.64	0.70	1	0.59 (0.1732.0)
Environmental alcohol use	0.19*	0.07	8.4	1	1.2 (1.131.4)