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Demographic and Psychosocial Characteristics of Mothers Using Methamphetamine During Pregnancy: Preliminary Results of the Infant Development, Environment, and Lifestyle Study (IDEAL)

Chris Derauf, M.D.¹, Linda L. LaGasse, Ph.D.², Lynne M. Smith, M.D.³, Penny Grant, M.D.⁴, Rizwan Shah, M.D.⁵, Amelia Arria, Ph.D.⁶, Marilyn Huestis, Ph.D.⁷, William Haning, M.D.¹, Arthur Strauss, M.D.⁸, Sheri Della Grotta, M.P.H.², Jing Liu, Ph.D.², and Barry M. Lester, Ph.D.²

¹John A. Burns School of Medicine, University of Hawaii, Honolulu, Hawaii, USA

²Brown Medical School, Women and Infant's Hospital and Bradley Hospital, Providence, Rhode Island, USA

³Los Angeles Biomedical Institute at Harbor-UCLA Medical Center and David Geffen School of Medicine at UCLA, Torrance, California, USA

⁴University of Oklahoma, Tulsa, Oklahoma, USA

⁵Blank Children's Hospital-Iowa Health, Des Moines, Iowa, USA

⁶University of Maryland, College Park, Maryland, USA

⁷Chemistry and Drug Metabolism, Intramural Research Program, National Institute on Drug Abuse, Baltimore, Maryland, USA

⁸Long Beach Memorial Medical Center, Long Beach, California, USA

Abstract

This study describes the psychological characteristics and caretaking environments of 131 women enrolled in the first longitudinal study of prenatal methamphetamine (MA) exposure and child development. Prenatal MA use was associated with lower maternal perceptions on quality of life, greater likelihood of substance use among family and friends, increased risk for ongoing legal difficulties, and a markedly increased likelihood of developing a substance abuse disorder. Our preliminary findings suggest that MA using women are more likely to have multiple, intertwined psychosocial risks that may result in maladaptive parenting and caregiving. These factors may impact the developmental outcomes of affected children.

Keywords

Maternal behavior; methamphetamine; parenting; substance abuse

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Address correspondence to Chris Derauf, M.D., Department of Pediatrics, 1319 Punahou Street, Honolulu, HI 96826, USA. dderauf@hawaii.edu.

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INTRODUCTION

Despite large increases in the overall abuse of methamphetamine (MA) in recent years (1) and indications that its use among pregnant women nationally may also be increasing (2-5), little has been reported on the psychosocial characteristics of women who use MA during pregnancy. Maternal substance abuse is associated with multiple psychosocial risks that may adversely affect child development, including poverty, mental illness, family dysfunction, and family violence (6,7). Furthermore, these characteristics may be associated with home and neighborhood environments that compound rather than mitigate the effects of adverse parenting (8).

The purpose of this study was to describe the psychological characteristics and caretaking environments of women who used MA during pregnancy and are enrolled in the multicenter, longitudinal IDEAL Study of prenatal MA exposure and child development.

METHODS

Overview

The primary goal of the IDEAL study is to investigate developmental outcomes associated with prenatal MA exposure. The study design has been previously described (5). This article reports on the psychosocial characteristics of biological mothers enrolled in the IDEAL study who were interviewed at the 1-month visit. Four clinical sites known to have MA problems were chosen to participate in the IDEAL project including Los Angeles, CA; Des Moines, IA; Tulsa, OK; and Honolulu, HI. The study was approved by the Institutional Review Board at each site. A National Institute on Drug Abuse Certificate of Confidentiality was obtained for the project that assured confidentiality of information regarding the subjects' drug use, superseding mandatory reporting of illegal substance use.

Study Participants

Between September 1, 2002 and August 31, 2003, 13,808 women were screened during the immediate postpartum period for participation in the IDEAL Study. A total of 1632 (11.8%) women were eligible and consented to participate. Eighty-four MA using and 92 non-MA using mothers and their infants were enrolled in the longitudinal follow-up. By 1 month of age, 35% of the MA exposed infants and 2% of the non-MA exposed infants were no longer in the care of their biological mothers due in large part to mandatory reporting of prenatal drug and alcohol use by hospital staff or prior child protective service referral. Therefore, at 1 month postpartum, 50 MA using and 81 non-MA using biological mothers were interviewed. One MA using mother did not complete the interview, leaving 49 mothers who contributed data to this study.

Study Procedures

Enrolled Mothers had information collected in the hospital about the course of the pregnancy, number of prenatal care visits, demographics (socioeconomic status [SES] calculated using the 4-factor Hollingshead index), educational level, age, race, marital status, type of insurance, and drug use during pregnancy. Mother-Infant dyads were classified into 2 groups based upon prenatal MA use: MA using, determined by maternal self-report and/or GC/MS confirmation of a positive meconium screen, and non-MA using, based upon denial of MA use during pregnancy and a negative meconium screen. Exposure status for marijuana, opiates, cocaine, and tobacco was determined by maternal self-report and/or GC/MS confirmation of a positive meconium screen. Exposure status for alcohol, benzodiazepines, and barbiturates was based solely on self-report. Use of tobacco, alcohol and marijuana were included in both the MA using and non-MA using groups. Use of LSD, PCP, opiates, and cocaine but no MA were

excluded. The groups were matched on birth weight, race, maternal education, and type of insurance.

Subsequently, at the 1-month study visit, trained interviewers obtained information about maternal depression using the Beck Depression Inventory-II (BDI-II), psychiatric symptoms using the Brief Symptom Inventory (BSI), substance abuse and dependence using the Substance Abuse Subtle Screening Inventory-3 (SASSI-3), and neighborhood characteristics. The BDI-II is a 21-item self-report instrument that measures the intensity of depression in the mother (9). The BSI is a 53-item questionnaire that measures psychiatric symptoms (10). The mother rated each item on a 5-point Likert scale of distress ranging from “not at all” [0] to “extremely” [4]. In this article we report on the Global Severity Index and the 9 primary symptom dimensions: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. The SASSI-3 identifies the probability of having a substance-use disorder (11). The SASSI-3 consists of 83 items presented in 2 parts. The first part yields 6 subscales describing characteristics associated with substance dependency including Obvious Attributes (OAT); Subtle Attributes (SAT); Defensiveness (DEF); Supplemental Addiction Measure which differentiates defensiveness related to substance dependence (SAM); Family versus Control Subjects (FAM) identifies family members of substance dependent persons; and Correctional (COR) identifies extensive histories of legal problems. The second part consists of 2 face valid items addressing how an individual's alcohol (Face Valid Alcohol—FVA) and other drug use (Face Valid Other Drug—FVOD) impacts their quality of life, and one face valid item that identifies serious substance misuse and being part of a family system affected by addictions (Symptoms of Substance Misuse—SYM). Taken together, these scales measure the probability of a substance dependence disorder (12). The Neighborhood Scale (13) contains 4 subscales of the quality of the neighborhood including the Probability of Success for Kids in Neighborhood; Neighborhood Problems; Neighborhood Cohesiveness; and Barriers to Services as well as a summary score, Total Neighborhood Quality.

Statistical Methods

We used one-way ANOVA to compare continuous measures, and Chi-square to compare categorical measures between MA using and non-MA using groups. Logistic regression was used to predict the odds of developing a substance use disorder after adjusting for SES and prenatal alcohol (use/no use), tobacco (use/no use), and marijuana use (use/no use). General linear modeling analyses compared psychosocial and neighborhood outcomes among MA using and non-MA using groups, adjusting for the same covariates.

RESULTS

Maternal Demographics

The demographic characteristics of the MA and non-MA using mothers were similar. Significant differences were noted only for the 2 measures of SES status, Hollingshead SES - Level V: (MA using = 14 (29%) vs. non-MA using = 8 (10%); $p = .006$) and Household Income < \$10,000: (MA using = 17 (38%) vs. non-MA using = 16 (21%); $p = .046$). As intended by the study design, there were no differences between the 2 groups in maternal ethnicity, education level, and insurance status. MA-using biological mothers who no longer had custody of their infants at 1 month post-partum ($N = 27$) had less prenatal care (74% vs. 98%, $p = .001$) and were less likely to report no religion (7% vs. 33%, $p = .013$) than MA-using mothers who retained custody ($N = 49$).

Maternal Drug Use During Pregnancy and Poverty

Significantly more women in the MA using group used tobacco ($n = 35$ [71%] vs. 20 [25%]; $p < .001$), alcohol ($n = 24$ [49%] vs. 13 [16%]; $p < .001$), and marijuana ($n = 22$ [43%] vs. 6 [8%]; $p < .001$) during pregnancy compared with women in the non-MA using group. Mean and median MA use across pregnancy (averaging in periods of no use) were 1.46 gr/wk and .83 gr/wk, respectively, with 60% using more than .5 grams/week of MA during pregnancy. Only 10% of this group reported using MA alone; the other 90% reported using MA in conjunction with 1 to 5 other licit and illicit drugs. Use of MA during pregnancy was positively correlated with use of tobacco ($r = .475$, $p = .01$), marijuana ($r = .432$, $p = 0.01$), and alcohol ($r = .361$, $p = .01$). Further, prenatal MA and tobacco use were negatively correlated with SES (MA: $r = -.293$, $p = 0.01$; tobacco: $r = -.273$, $p = .01$). There were no differences in average MA use across pregnancy for mothers who no longer had custody of their infants compared to mothers in this study (1.24 vs. 1.46 gr/wk, $p = .615$); however, reported prenatal alcohol use was less in mothers without custody (22% vs. 49%, $p = .022$) than in mothers who retained custody.

Maternal Psychosocial Characteristics, Risk for Substance Use, and Neighborhood Characteristics at 1-Month Postpartum

After adjusting for prenatal tobacco, alcohol, and marijuana use, and for SES, no differences in BDI and BSI scores were found between the MA using and non-MA using mothers. Table 1 shows mean differences by prenatal MA exposure status in subscale items and maternal risk for substance use at 1-month post-partum as assessed using the SASSI-3. The MA using group had higher scores for FVA (adjusted $p = .048$), FVOD, SYM, OAT, SAT, SAM, and COR (all adjusted p values $< .001$). The MA using group had lower scores on two subscales, DEF (adjusted $p = .005$) and FAM (adjusted $p = .000$). 74% of the MA using women were determined to have a high probability of developing a substance dependence disorder, compared to 11% of the non-MA using women (adjusted $p < .001$). The odds of a mother who used MA during pregnancy developing a substance use disorder was 12 times that of the non-MA using group (OR (95% CI) = 12.08 (4.06–35.94), adjusted $p < .001$). When covariates were added in GLM analyses, no differences were found between groups for any of the neighborhood summary variables.

DISCUSSION

To our knowledge, this is the first prospective study addressing the psychological and social characteristics of MA using women during the perinatal period. After adjusting for covariates, prenatal MA use was associated with 1) lower maternal perceptions on quality of life; 2) greater likelihood of having family and social systems where substance use is the norm; 3) increased risk for ongoing legal difficulties; and 4) a markedly increased likelihood of developing a substance abuse disorder, as measured by the SASSI-3. In accord with multiple other recent studies (6,7,14,15), our findings suggest that MA using women are more likely to have multiple, intertwined psychosocial risks that may result in maladaptive parenting and caregiving. This finding raises concern for the children living in these settings, given the substantial evidence linking the cumulative impact of multiple risk factors with adverse child outcomes (14,16). Additionally, our finding of extended family and social system involvement with drugs and alcohol raises the possibility of increased risk for adverse caregiving even when the biological mother might be absent.

We found a markedly heightened risk (12 fold) of substance dependence among postpartum MA using women. To our knowledge, our study is the first to report that the majority of women (nearly 75%) who use MA during pregnancy have a high likelihood of meeting medical criteria for substance dependence. Therefore, any sign of MA use during pregnancy is likely to be

predictive of MA dependence; conversely, “casual use” or even “abuse” without dependence is likely to be infrequent. This is important because epidemiologic and targeted high-risk sampling studies reveal strong associations between substance abuse and psychiatric disorders (6).

A few studies looking at the issue of female MA use, but not specifically use during pregnancy, have described high rates of family conflict, social isolation, impoverished and chaotic home life, parental alcohol and drug use, and physical, psychological, interpersonal, and economic difficulties (17-19). Several possible explanations exist for our failure to find associations as did these studies between prenatal MA use and elevated levels of psychological distress. First, our sampling methodology intentionally recruited a nonreferred community sample of post-partum women screened from local hospitals—women with a broad spectrum of MA use, ranging from those who had quit early in pregnancy to those who continued to use almost daily. In contrast, the 3 comparative samples of women reported above were recruited based on moderate to heavy MA use, meeting DSM-IV criteria for MA dependence, or their enrollment in a treatment study. Therefore, our nonreferred sample may have identified women with less associated comorbidity. Second, we may have predominantly recruited casual or sporadic MA users and missed those most affected by MA addiction. We believe this is not the case since the median amount of MA used in our sample, .83 grams per week, is similar to that reported in the Semple (.64 grams/week) (personal communication with Shirley Semple, Ph.D., March 13, 2006) and Joe (.81 grams/week) studies of nonpregnant MA using women. And finally, physiological factors during pregnancy may have diminished the severity or occurrence of psychological symptoms induced by MA use. For instance, there is some evidence from animal studies that estrogens are neuroprotective against the adverse effects of MA (20).

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Table 1

Attributes and risk of substance dependency in methamphetamine using (MA using) and non-methamphetamine using (non-MA using) groups, assessed by the Substance Abuse Subtle Screening Inventory-3 (SASSI-3)

Attributes	Mean (SD)		Adjusted p
	MA using group (N = 49)	Non-MA using group (N = 81)	
Face valid alcohol (FVA)	3.78 (6.12)	.30 (0.86)	.048
Face valid other drugs (FVOD)	16.35 (11.19)	.49 (2.20)	.000
Symptoms of substance misuse (SYM)	6.39 (2.23)	2.70 (2.40)	.000
Obvious attributes (OAT)	6.12 (1.89)	3.46 (2.16)	.000
Subtle attributes (SAT)	3.57 (1.24)	2.36 (1.03)	.000
Defensiveness (DEF)	4.35 (1.63)	5.63 (1.82)	.005
Supplemental addiction measure (SAM)	8.45 (2.02)	5.26 (2.00)	.000
Family vs. controls subjects (FAM)	5.88 (1.83)	7.60 (1.47)	.000
Correctional (COR)	7.04 (2.18)	3.80 (2.35)	.000
High probability of substance dependence disorder	36 (73.5%)	9 (11.1%)	.000