

Brief Report

Alcohol Consumption Among Breastfeeding Women

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ABSTRACT

Purpose: To determine the prevalence of alcohol consumption among breastfeeding and non-breastfeeding women at 3 months postpartum.

Methods: We analyzed the most recent data available, which were from the 1993–1994 Food and Drug Administration Infant Feeding Practices Study I, a longitudinal panel study of infant–mother pairs. Self-reported data on alcohol consumption were analyzed for 772 breastfeeding women and 776 non-breastfeeding women age ≥ 14 years.

Results: At 3 months postpartum, 36% of breastfeeding women and 40% of non-breastfeeding women consumed alcohol ($p = 0.09$). In multinomial regression models adjusted for age, race, education, income, marital status, region, smoking, and alcohol consumption before and during pregnancy, breastfeeding women were significantly less likely than non-breastfeeding women to consume two drinks per week ($p < 0.01$), or equal to or more than three drinks per week ($p < 0.01$), but equally likely to consume one drink ($p = 0.23$).

Conclusions: A substantial percentage of breastfeeding women consumed alcohol. Their infants may or may not have been exposed, as some women may have used alcohol avoidance strategies. Nationally representative data are needed on alcohol consumption and infant feeding practices among breastfeeding women.

INTRODUCTION

THERE IS ONGOING DEBATE among alcohol researchers about the possible impact of moderate drinking by breastfeeding women on infants' development and subsequent sensitivity or tolerance to alcohol during childhood and adolescence.^{1–3} To inform the debate, data

are needed on the national prevalence of alcohol consumption among breastfeeding women.

In 2005, the estimated prevalence of alcohol consumption among U.S. women of childbearing age (15 to 44 years) was 51% in the past month and 71% in the past year;⁴ the estimated prevalence of breastfeeding at 3 months postpartum was 54%.⁵ We could find no national

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data on combined prevalence in literature searches covering the years 1990 through 2006.

The purpose of our study was to determine the prevalence of alcohol consumption among breastfeeding women using the most recent data available. These were from the 1993–1994 Food and Drug Administration Infant Feeding Practices Study I, which included a large sample of infant–mother pairs.

METHODS

Study

The 1993–1994 FDA Infant Feeding Practices Study I was a longitudinal panel study of infant–mother pairs followed from late pregnancy through the infant’s first year. Methodological details including eligibility criteria and nonresponse have been described.⁶ In brief, a consumer panel was selected as the sampling frame because this was one of the few ways to find a nationally distributed sample of pregnant women, and because panels have higher response rates than general population samples. Additional information on the consumer panel is available.⁷ Within the sampling frame, 3155 households with pregnant women were sent prenatal questionnaires. The base sample of 2615 infant–mother pairs excluded 540 pairs where infants had low birth weights and/or infants or mothers had significant health problems at birth.

Mailed questionnaires assessed family characteristics and mother’s infant feeding practices, alcohol consumption, and smoking. Mothers completed questionnaires: 90 to 42 days before their due date (prenatal), shortly after giving birth (birth screener), and when the child was 1 (neonatal), 2, 3, 4, 5, 6, 7, 9, and 12 months of age. The Infant Feeding Practices Study I response rate, based on completion of the prenatal, birth screener, and neonatal questionnaires was 69% (1803/2615). Our study used data from the prenatal and 3 month questionnaires, completed by 1549/1803 women.

Measures

Breastfeeding status. Breastfeeding status at 3 months postpartum (3 month questionnaire) was assessed by asking mothers: “Have you

breastfed your baby in the past 7 days?” Breastfeeding women were those who responded “yes” (whether or not they also fed formula or food); non-breastfeeding women were those who responded “no.”

Alcohol consumption. Alcohol consumption before pregnancy (prenatal questionnaire) was assessed by asking mothers: “Did you drink any alcoholic beverages in the 3 months before you became pregnant?” and “On the average, how many drinks of alcoholic beverages did you have a week or a month?” Alcohol consumption during pregnancy (prenatal questionnaire) was assessed by asking: “On the average, how many drinks of alcoholic beverages do you have a week or a month now?” Alcohol consumption at 3 months postpartum (3 month questionnaire) was determined by asking: “Did you drink any alcoholic beverages during the past 2 weeks?” and “On the average how many drinks of alcoholic beverages did you have a week?”

Sample

Our analytic sample included 1548 women (772 breastfeeding and 776 non-breastfeeding) who completed the 3 month questionnaire, including questions on alcohol consumption (we excluded one woman missing data on alcohol).

Analysis

We calculated, by breastfeeding status, the percent of women in categories of demographic variables (age, race, education, income, marital status, and geographic region), smoking in the past 2 weeks (assessed at 3 months postpartum), and alcohol consumption (before pregnancy, during pregnancy, and 3 months postpartum); significance of differences was determined using *t*-tests for continuous variables and chi-square tests for categorical variables. To determine the association between breastfeeding status and alcohol consumption at 3 months postpartum, we performed a multinomial logistic regression analysis that adjusted for demographics, smoking, and alcohol consumption before and during pregnancy. Analyses were performed using SAS version 9.0 for Windows (SAS Institute, Cary, NC). Sta-

tistical significance was defined as $\alpha < 0.05$; p -values were two tailed.

RESULTS

Breastfeeding women were significantly older than non-breastfeeding women, and sig-

nificantly more likely to be White and to have completed college, live above poverty, be married or cohabiting, and be a nonsmoker (Table 1). Controlling for no other variables, breastfeeding and non-breastfeeding women had similar alcohol consumption before pregnancy, during pregnancy, and at 3 months postpar-

TABLE 1. WOMEN'S SOCIODEMOGRAPHIC AND LIFESTYLE CHARACTERISTICS, BY BREASTFEEDING STATUS: INFANT FEEDING PRACTICES STUDY I

Characteristics ^a	Women		p difference ^b
	Breastfeeding (n = 772)	Not breastfeeding (n = 776)	
Age			
Mean	29.6	27.6	<0.01
(Median)	(29)	(28)	
Race	(%)	(%)	
White	97.6	95.3	
Other	2.4	4.7	<0.01
Education			
Some college or less	56.9	74.8	
Completed college or more	43.1	25.2	<0.01
Income			
Poverty/near poverty ^c	21.4	31.8	
Above poverty	78.6	68.2	<0.01
Married or cohabiting			
Yes	95.0	88.9	
No	5.0	11.1	<0.01
Region			
Northeast	18.2	19.7	
Midwest	28.8	32.0	
South	26.6	31.6	
West	26.3	16.8	<0.01
Smoking			
Smoker	8.6	23.4	
Nonsmoker	91.4	76.7	<0.01
Alcohol before pregnancy (drinks/week)			
None	50.2	50.1	
≤1	34.4	33.4	
2	5.8	4.8	
≥3	9.7	11.6	0.56
Alcohol during pregnancy			
None	93.2	94.5	
Some	6.8	5.6	0.31
Alcohol 3 months postpartum (drinks/week)			
None	64.1	59.9	
≤1	18.7	18.0	
2	8.8	11.0	
≥3	8.4	11.1	0.12
Alcohol 3 months postpartum versus before pregnancy (drinks/week)			
None at both times	45.2	42.4	
Less at 3 months postpartum	23.9	22.2	
Same at 3 months postpartum	18.8	18.0	
More at 3 months postpartum	12.0	17.4	0.03

^aWomen with missing data are excluded; percentages may not sum to 100% due to rounding.

^b p -values are based on global chi-square tests.

^c<185% poverty index.

tum. However, breastfeeding women were less likely than non-breastfeeding women to increase their alcohol consumption at 3 months postpartum relative to before pregnancy.

In a multinomial regression model adjusted for age, race, education, income, marital status, geographic region, smoking, and alcohol consumption before and during pregnancy, breastfeeding status significantly predicted consumption at 3 months postpartum for 2 drinks per week, and 3 or more drinks per week, but not 1 drink per week, that is, breastfeeding women were less likely to drink higher amounts of alcohol than non-breastfeeding women (Table 2).

Among covariates, alcohol consumption before and during pregnancy were significant predictors. However, removing these covariates from the model did not substantially alter results. The interaction between alcohol consumption before pregnancy and breastfeeding status was not statistically significant.

DISCUSSION

In the Infant Feeding Practices Study I, breastfeeding and non-breastfeeding women were equally likely to consume alcohol at 3

TABLE 2. PREDICTORS OF ALCOHOL CONSUMPTION AT 3 MONTHS POSTPARTUM AMONG WOMEN IN MULTINOMIAL REGRESSION ANALYSES: INFANT FEEDING PRACTICES STUDY I

Predictors ^a	Average number of drinks per week (3 Months postpartum)								
	≤1 drink (vs. none)			2 drinks (vs. none)			≥3 drinks (vs. none)		
	Adjusted OR ^b	95% CI	p	Adjusted OR	95% CI	p	Adjusted OR	95% CI	p
Age	0.98	0.95–1.02	0.27	1.02	0.97–1.07	0.50	1.07	1.02–1.13	0.01
Race									
White	0.97	0.42–2.22	0.93	0.09	0.28–2.98	0.87	0.93	0.18–4.83	0.93
Other	—	—	—	—	—	—	—	—	—
Education									
Some college or less	—	—	—	—	—	—	—	—	—
College or more	0.99	0.71–1.38	0.94	1.26	0.80–1.99	0.32	0.97	0.57–1.67	0.92
Income									
Poverty/near poverty	—	—	—	—	—	—	—	—	—
Above poverty	0.63	0.43–0.92	0.02	0.69	0.40–1.19	0.18	1.32	0.74–2.36	0.34
Married or cohabiting									
Yes	2.40	1.18–2.40	0.02	1.04	0.43–2.48	0.94	4.21	1.20–14.82	0.03
No	—	—	—	—	—	—	—	—	—
Region									
Northeast	1.71	1.06–2.75	0.03	1.22	0.65–2.32	0.54	0.58	0.27–1.22	0.15
Midwest	1.21	0.78–1.87	0.39	0.87	0.49–1.56	0.64	0.74	0.39–1.41	0.36
South	0.91	0.58–1.44	0.69	0.71	0.38–1.32	0.28	0.91	0.47–1.75	0.77
West	—	—	—	—	—	—	—	—	—
Smoking									
Smoker	0.85	0.53–1.36	0.49	0.94	0.53–1.68	0.83	1.14	0.60–2.15	0.68
Non-smoker	—	—	—	—	—	—	—	—	—
Alcohol before pregnancy (drinks/week)									
None	—	—	—	—	—	—	—	—	—
≤1	5.88	4.19–8.24	<0.01	14.96	7.73–28.94	<0.01	12.42	5.62–27.43	<0.01
2	8.93	4.32–18.46	<0.01	81.52	34.41–193.10	<0.01	46.02	15.23–139.02	<0.01
≥3	8.13	4.16–15.92	<0.01	69.34	29.84–161.09	<0.01	230.85	93.72–568.63	<0.01
Alcohol during pregnancy									
None	—	—	—	—	—	—	—	—	—
Some	1.32	0.60–2.91	0.49	2.50	1.10–5.67	0.03	4.74	2.12–10.56	<0.01
Breastfeeding group									
Breastfeeding	0.82	0.60–1.13	0.23	0.51	0.33–0.79	<0.01	0.40	0.24–0.67	<0.01
Not breastfeeding	—	—	—	—	—	—	—	—	—

^aAdjusted for all covariates in table.

^bOR indicates odds ratio; CI, confidence interval.

months postpartum, but breastfeeding women consumed lower amounts.

In analyses controlled for confounding variables, breastfeeding and non-breastfeeding women were equally likely to consume one drink per week, but breastfeeding women were less likely to consume two drinks or three or more drinks per week. Our results confirm previous findings in a Seattle health maintenance organization⁸ that usual drinking at 3 months postpartum was similar among women who breastfed and never breastfed, but breastfeeding women overall reported less drinking.

An important reason for studying alcohol consumption among breastfeeding women is to estimate the potential for infant exposure. The prevalence of alcohol consumption in breastfeeding women estimates the upper boundary for prevalence of infant exposure (logically, no more infants can be exposed postpartum than there are breastfeeding women who consume alcohol), but not the actual prevalence. The prevalence of infant exposure could be substantially lower than the prevalence of maternal exposure. Breastfeeding women can avoid exposing their infants to alcohol by timing drinking in relation to feeding,^{3,9} or by feeding stored milk or formula. Our study did not include data on avoidance practices in relation to alcohol consumption. However, it is a reasonable assumption that some women in our relatively low drinking sample may have employed these practices.

The majority of mothers in our study who consumed alcohol drank fewer than three drinks per week. A current area of controversy is the effect of moderate drinking during lactation on early infant learning. The infant receives only a small proportion of the maternal dose due to dilution by the infant's high body water content.^{1,9} However, one study found that infants of breastfeeding mothers who consumed a mean of five drinks per month could detect the flavor of alcohol and, in a two bottle test, sucked and consumed more alcohol-flavored milk than unaltered milk.¹⁰ In another study,¹¹ infants with greater prior exposure to alcohol exhibited more mouthing of alcohol-scented than vanilla-scented toys. Readers with an interest in this area are referred to recent reviews.^{1,3}

Recent national data on alcohol consumption among breastfeeding women are scarce. The primary U.S. health surveys that include data on alcohol consumption include too few breastfeeding women to produce accurate estimates. Keeping that caveat in mind, but realizing that readers would be interested in any current nationally representative estimates, we performed post hoc tabulations using data from the 1999–2002 National Health and Nutrition Examination Survey.¹² Of 88 breastfeeding women age ≥ 20 years, 36 consumed alcohol in the past year; of these, eight (unweighted, 22%; sample weighted, 33% [95% confidence interval: 15% to 58%]) consumed alcohol in the past 24 hours.

Comparing studies, the Infant Feeding Practices Study I had a large, but not nationally representative, sample while NHANES had a nationally representative but small sample producing unreliable estimates. Furthermore, the studies measured drinking differently, over different durations, and in different age groups. In the Infant Feeding Practices Study I, some heavier drinking women may have been excluded because the sample design excluded infants with low birth weights and/or infants or mothers with significant health problems at birth. Other limitations of the Infant Feeding Practices Study I were that it overrepresented higher socioeconomic groups and underrepresented mothers from race/ethnicities other than non-Hispanic White. In addition, the data, collected in 1993–1994, may not reflect current drinking practices among breastfeeding women. That said, the Infant Feeding Practices I Study had several strengths. It included a large sample of mother–infant pairs and recall bias was minimized because questionnaires were administered close to relevant time periods. Given the very different samples and methodologies of the Infant Feeding Practices Study and NHANES 1999–2002, the similar findings from both that approximately one-third of breastfeeding women consumed alcohol should be interpreted with caution.

When we started this study, our research question was “What is the national prevalence of infant exposure to alcohol through breastfeeding?” The question was asked in order to provide a public health frame for current dis-

cussions among alcohol researchers regarding the presently unclear significance of exposure to minimal amounts of alcohol through breastfeeding on alcohol-related outcomes at later ages.¹⁻³ In the absence of data on infant exposure, we examined data on the prevalence of alcohol consumption among breastfeeding women. There is a need for nationally representative data on the prevalence of alcohol consumption and alcohol-related infant feeding practices among breastfeeding women. Our data are insufficient to inform policy or medical guidelines on alcohol consumption in breastfeeding women.

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