

Is Pregnancy the Time to Change Alcohol Consumption Habits in France?

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Background: Although it is well known that France has a cultural history of alcohol use, no recent French data on alcohol consumption during pregnancy in a large sample are available.

Methods: To determine the alcohol consumption patterns among pregnant women in France, we analyzed data from a 1-year multicenter self-survey. Sociodemographic profile, obstetrical history, neonatal data, and a self-report for assessing drinking patterns during pregnancy including AUDIT were recorded from women who delivered recently. Cases of fetal alcohol syndrome (FAS) were also reported.

Results: A total of 837 pregnant women have described all parameters. The mean age at delivery of our sample was 29.7 years (SD = 4.8 years). A total of 52.2% of women indicated that they had consumed alcohol at least once during their pregnancy, and among abstainers 54.5% had a positive AUDIT score. Of the pregnant women who consumed alcohol, 13.7% reported at least one binge drinking episode (5 or more drinks on 1 occasion) during pregnancy. Binge drinking is significantly more frequent than regular alcohol consumption (at least 1 drink more than 1 time per week) during pregnancy. A prevalence rate of FAS of 1.8 per 1,000 live births was observed.

Conclusions: There is a large population of women who still drink alcohol during pregnancy, particularly in binge drinking episodes. This underlines the need to clearly inform women of childbearing age about the dangers of alcohol during pregnancy as related to all types of consumption. Moreover, acting to prevent alcohol consumption prior to pregnancy may also greatly influence prenatal drinking.

Key Words: Pregnancy, Alcohol, AUDIT, Fetal Alcohol Syndrome, Epidemiological Study.

FRANCE HAS RECENTLY approved health warning labels on alcohol packaging regarding drinking during pregnancy, following scientific evidence that alcohol consumed during pregnancy increases the risk of alcohol related birth defects, including growth deficiencies, facial abnormalities, central nervous system impairment, behavioral disorders, and intellectual development (Behnke and Eyler, 1993; Day et al., 1989; Jacobson and Jacobson, 1999; Martinez-Frias et al., 2004; Mattson et al., 1997). However, in many European countries, controversy regarding the safety of moderate to occasional drinking during pregnancy has been exposed, notably because alcohol abstinence clinical trials and long-term studies do not exist.

Countries like England and France are largely influenced by culture because wine and beer are traditionally part of regular eating habits. Limited published data exist in France to assess the prevalence of alcohol consumption during pregnancy. In the most recent study on a large population of pregnant women (235 women) in France, carried out in 1992, 23% of women reported alcohol consumption during pregnancy (Kaminski et al., 1995).

Biological markers currently in use may not be effective in screening for alcohol use occurring over all terms of pregnancy (Kaminski et al., 1995; Russell et al., 1994, 1996; Savage et al., 2002), and self-reports are a good assessment of the amount of drinking (Miller et al., 2006). The major disadvantages of this method are that it is often difficult for people to recall the amount and frequency of their alcohol intake (Dawson and Room, 2000; Greenfield et al., 2006) and there is a potential bias of underreporting (Bearer et al., 2003). Pregnancy-specific screening tools, such as quantity/frequency questions, the TWEAK, and the T-ACE have been developed specifically for prenatal care and are particularly relevant (Mengel et al., 2006). Regrettably, they do not exist in the French language. As recommended by INSERM Collective expert reports (2003), we used the Alcohol Use Disorder Identification Test (AUDIT) questionnaire. It is a valid and convenient instrument (Bradley et al., 1998; Chang et al., 1999) developed by a World Health Organization study

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group (Saunders et al., 1993a,b). AUDIT is considered one of the best tests for detection of hazardous alcohol use and is available in French (Saunders et al., 1993a). The purpose of this paper was to provide descriptive data on alcohol consumption habits during pregnancy, including AUDIT score, frequency, and amount and type of alcohol in a sample of women in France.

MATERIALS AND METHODS

Setting

This multicenter study approved by the ethics committee was carried out between July 2003 and June 2004 in public and private obstetric services in administrative areas of the Center of France region. This investigation is part of a wider program on habits during pregnancy. A 1/12th random sampling by drawing lots determined maternity ward methodical arrangement (determination of order of participation; 2 maternity wards might be screened the same month). Women were consecutively recruited over 1 month in each maternity ward and interviewed on the day of delivery. Women over 18 years of who could read French, gave birth to a live new born, and signed informed consent form were eligible for the self-survey. Four questionnaires were applied: a sociodemographic profile, an obstetrical history, neonatal data, and a self-report for assessing drinking patterns during pregnancy, including AUDIT. This questionnaire is divided into 3 sections: consumption, dependence, and alcohol-related problems. The AUDIT score was calculated from sum responses to the full 10 items (range of scores, 0 to 40). It has good sensitivity and specificity for detection across a range of different levels of alcohol use and problems (Allen et al., 1997; Saunders et al., 1993b).

Cases of fetal alcohol syndrome (FAS) were also reported using classical diagnostic criteria for FAS as set forth by Jones et al. (1973) and diagnosed by a pediatrician.

Data analysis was performed using the SAS® statistical software package. Statistical tests used a 2-sided risk α of 5%. Either chi-squared tests or Student *t*-tests were used for the categorical variables.

RESULTS

Of the 1,114 women who had given birth in all the maternity wards surveyed during the study period, 1,050 met the inclusion criteria and agreed to participate. Of these, 837 reported their environmental tobacco smoke exposure and tobacco status. Maternal and neonatal characteristics are shown in Table 1.

The mean age at delivery was 29.7 years (SD = 4.8 years) with a range from 18.0 to 42.0 years. It was the first pregnancy for 28.8% of the women surveyed. A total of 75.6% of the women worked and 67.3% of them were clerks or trade-related employees; 22.2% of the women smoked during their pregnancy.

Multiple pregnancies were not studied here and accounted for 1.8% of the deliveries ($n = 852$). The mean gestational age was 39.3 weeks ($n = 837$; SD = 1.4 weeks; range, 28 to 42 weeks). A total of 18.5% of mothers underwent cesarean deliveries. The mean birth weight was 3,278 g ($n = 837$; SD = 487 g; range, 707 to 4,850 g). A total of 3.5% of babies were transferred to the neonatal intensive care unit.

Table 1. Maternal and Neonatal Characteristics of the Sample Surveyed ($n = 837$)

	All study population	AUDIT score = 0	AUDIT score >0
Maternal characteristics (n)	837	182	655
Age (mean \pm SD)	29.7 \pm 4.8	29.0 \pm 4.5	29.9 \pm 4.9*
First pregnancy (%)	28.8	31.9	27.9
Occupational situation (%)			
Working	75.6	76.4	75.4
Seeking work	5.6	5.5	5.6
No occupation	1.3	1.1	1.4
Housewife	17.1	17.0	17.1
Disability	0.4	0	0.5
Occupational class in those working (%)			
Farmers	2.0	1.4	2.2
Craft trade and firm managers	6.2	7.2	5.9
Upper managerial staff and professionals	5.7	4.3	6.1
Intermediary occupations	12.3	13.7	11.9
Manual workers	6.5	8.6	5.9
Clerks and trade-related employees	67.3	64.8	68.0
Single newborn characteristics (n)	837	182	655
Gestational age in weeks (mean \pm SD)	39.3 \pm 1.4	39.4 \pm 1.3	39.2 \pm 1.5
Mode of delivery (%)			
Spontaneous vaginal	69.5	68.1	69.9
Instrument-assisted	12.0	11.0	12.2
Cesarean	18.5	20.9	17.9
Birth weight in grams (mean \pm SD)	3278.4 \pm 487.4	3253.3 \pm 435.3	3285.4 \pm 501.0
Transfer to neonatology, reanimation or intensive care service (%)	3.5	2.8	3.7
Mother smoker (%)	22.2	23.6	21.8

* $p < 0.05$ relative to AUDIT score = 0.

Table 2. Repartition of AUDIT Total Scores for Abstainers and Not in Pregnant Women Population ($n = 837$)

	Audit total scores								
	0	1	2	3	4	5	6	8	10
Declared total abstainers (%) $n = 400$	182 (45.5)	211 (52.8)	4 (1.0)	1 (0.3)	1 (0.3)	1 (0.3)	0	0	0
Smokers (%) $n = 93$	43 (46.2)	47 (50.5)	2 (2.2)	0	0	1 (1.1)			
Nonsmokers (%) $n = 307$	139 (45.3)	164 (53.4)	2 (0.7)	1 (0.3)	1 (0.3)	0			
Declared nonabstainers (%) $n = 437$	0	271 (62.0)	100 (22.9)	34 (7.8)	16 (3.7)	7 (1.6)	6 (1.4)	2 (0.5)	1 (0.2)
Smokers (%) $n = 93$		48 (51.6)	22 (23.7)	11 (11.8)	6 (6.5)	2 (2.2)	3 (3.2)	0	1 (1.1)
Nonsmokers (%) $n = 344$		223 (64.8)	78 (22.7)	23 (6.7)	10 (2.9)	5 (1.5)	3 (0.9)	2 (0.6)	0

Alcohol Consumption and Total AUDIT Scores

Total abstainers are in the minority because 52.2% (437/837) of the women indicated that they had consumed alcohol at least once during their pregnancy (qualified as "nonabstainers") (Table 2). However, according to the AUDIT scores, 54.5% of abstainers have a positive score. Indeed, 52.8% have an AUDIT score of 1, corresponding to women who reported consuming 3 or 4 standard drinks containing alcohol on a typical day when drinking or fewer than 6 or more drinks on 1 occasion per month (data not shown). Eleven percent (48/437) of drinkers consumed alcohol during the entire period and at meals (data not shown).

Alcohol consumption patterns during pregnancy are reported in Table 3. Of the women who did consume alcohol during pregnancy, 94.3% of pregnant nonabstainers consumed 1 or 2 drinks on 1 occasion. A total of 69.1% reported consuming 1 or 2 drinks on 1 occasion once per month or less; 4.8% of pregnant nonabstainers consumed alcohol more than 2 times per week (regular consumption). A total of 3.2% of pregnant nonabstaining women reported consuming 3 to 6 standard drinks on a typical occasion 2 to 4 times per month. Only 1 woman consumed 5 to 6 standard drinks on a typical occasion; she had an AUDIT score of 6 (data not shown). If pregnancies were divided based on actual low-risk pregnancy status (no consumption or consumption once per month) or actual high-risk pregnancy status (consumption at least 2 times per month), 28.8% would be classified as "high-risk."

In reference to the AUDIT cut-off of 6 for detecting hazardous or harmful alcohol for nonpregnant women (Bergman and Kallmen, 2002), 9 individuals (2.1%) were identified. An AUDIT score of 2 or more was observed in 38.0% of whom?

Table 3. Amount and Frequency of Drinking During Pregnancy Among Drinkers ($n = 437$)

Number of standard drinks on a typical occasion (%)	Frequency of drinking on a typical occasion (%)			
	≤1 time per month	2 to 4 times per month	2 to 3 times per week	≥ 4 times per week
1 or 2	69.1	20.4	4.1	0.7
3 or 4	1.8	3.2	0.5	0
5 or 6	0.2	0	0	0

Pregnant or nonpregnant women? (166/437) (Table 2). Among nonabstainers who had an AUDIT score of 2 or more, 27.1% (45/166) were smokers. If we increase the cut-off to 4, 37.5% (12/32) were smokers; for a cut-off of 6, 44.4% (4/9) were smokers (Table 2).

Binge Drinking

Of the pregnant women who consumed alcohol, 13.7% reported at least 1 binge drinking episode (i.e., 5 or more drinks on 1 occasion) during pregnancy (Table 4) (7.2% of the entire study population). Thirteen percent of women reported 1 to 8 binge episodes during their pregnancy (Table 4). In our study, we observed that the proportion of binge drinkers is more important than that of regular alcohol consumers (at least 1 drink more than 1 time per week) (13.7 vs. 5.3%, $p < 0.05$). Moreover, binge drinkers are more likely to be typically high-quantity consumers (AUDIT score ≥ 3) (41/60 = 68.3 vs. 23.3%, $p < 0.05$) and tobacco users (38.3 vs. 18.6%, $p < 0.05$) than women did not drink 5+ drinks during their pregnancy. Binge drinkers with a typical high quantity of consumption (AUDIT score ≥ 3) did not significantly differ in age from binge drinkers who did not have a high typical quantity of consumption.

Case of FAS

Two women gave birth to typical FAS children resulting in a prevalence rate of 1.8 per 1,000 live births. The first woman claimed to consume water at mealtimes, but drank 1 or 2 beers 2 to 3 times per week. An acquaintance or doctor expressed concern about her drinking and suggested more than a year prior that she should reduce her consumption of alcohol. The second woman claimed to consume only water, both during and outside of mealtimes. Nevertheless, she confessed to consuming 6 glasses containing alcohol on several occasions during her pregnancy.

DISCUSSION

Prevalence of Alcohol Use

In our study, approximately 52% of pregnant women used alcohol. This is very different compared with countries like

Table 4. Frequency of Drinking 5+ Drinks During Pregnancy ($n = 437$)

	Total (%)	AUDIT score ≥ 3 (%)	Smokers (%)	Age (mean \pm SD)	Occupational class in those working (%)	
Never	377 (86.3)	88 (23.3)	70 (18.6)	30.5 \pm 4.6	Upper managerial staff and professionals/intermediary occupations	Manual workers/clerks/trade-related employees
< Once per month	57 (13.0)	38 (66.7)	23 (38.3)*	30.1 \pm 4.9		
Once per month	2 (0.5)	2 (100)				
Once per week	1 (0.2)	1 (100)				
Total	437					
AUDIT score ≥ 3 and binge drinkers ($n = 41$)			41.5	30.1 \pm 4.9	21.2	75.8
AUDIT score <3 and binge drinkers ($n = 19$)			31.6*	29.4 \pm 5.1	14.3	78.6

* $p < 0.05$.

the United States, in which 12% of pregnant women report alcohol use (Floyd and Sidhu, 2004). More recent U.S. data for women 18 to 44 years old (childbearing age) from the 2005 Behavioral Risk Factor Surveillance System survey indicated consistent values. The survey determines the potential number of women at risk for an alcohol-exposed pregnancy. However, these data refer to 1 or more drinks during the last 30 days and not over the entire pregnancy. Colvin et al., in 2007, showed that alcohol consumption may be “chaotic” over the 3 trimesters of pregnancy. Our French value is close to that observed for nonindigenous West Australian women, 59% of whom drank alcohol during pregnancy (Colvin et al., 2007), or for Russian women, two thirds of whom drank at some point during their pregnancy (Kristjanson et al., 2007). In Sweden, 30% of women reported regular consumption during pregnancy (Goransson et al., 2003).

The differences between countries may be explained by the specificity of national alcohol prevention programs and national demographic variables. Indeed, demographic variables, such as race/ethnicity (Wallace, 1999; Wiemann et al., 1995), socioeconomic background (Cornelius et al., 1999), and health history (e.g., parity, use of prenatal care) (Cornelius et al., 1999; Jones-Webb et al., 1999; Westphal, 2000) are known to influence substance use during pregnancy.

In France, there is little difference between the prevalence of alcohol use during and outside of pregnancy. A total of 61.4% of women 15 to 75 years reported drinking to drink alcohol at least weekly (Legleye, 2002). Moreover, the geography of French alcohol consumption indicates frequent daily alcohol consumption in the region of study (19.2% to 23.3% of women 15 to 75 years old, on average) that is rather high in quantity (2.2 to 2.3 glasses, on average) (Legleye, 2002). The lack of change of drinking patterns is not related to the dependence status of pregnant women as exposed by the AUDIT total score. Previous alcohol use seems to be the strongest predictor of prenatal alcohol use. Chang et al.

(2006) contended alcohol consumption just before pregnancy predicted drinks per drinking day during early pregnancy and that alcohol consumption in early pregnancy predicted the subsequent percentage of drinking days during late pregnancy. In the same way, Palma et al. (2007) concluded in their study that alcohol consumption before pregnancy significantly influenced the rate of alcohol cessation during pregnancy: the heavier the alcohol consumption on weekdays before pregnancy, the lower the rate of alcohol cessation during pregnancy (Palma et al., 2007).

Different explanations may be suggested for non-alcohol-dependent women. Knowledge of pregnancy is not sufficient. Alcohol consumption produces effects that are often perceived, even among pregnant women, as positive, as evidenced by the widespread popularity of drinking, especially in France. Moreover, the message of “zero” alcohol consumption during pregnancy is frequently passed on and understood as limited alcohol intake. As exposed by the Public Health Agency of Canada, a clear message regarding “how much alcohol is too much” would minimize the confusion regarding what is safe for women who are pregnant.

Binge Drinking

We confirmed the report of Tsai et al., (2007a,b) that binge drinkers with a high typical quantity of consumption are more likely young and smokers (Tsai et al., 2007b). However, U.S. values estimating binge drinking prevalence during pregnancy are much lower (around the third) than ours, 4.6 (Floyd and Sidhu, 2004) and 13.7%, respectively. The number seems to rise over the years, if we extrapolate to the estimated number of women of childbearing age who engaged in binge drinking from 2001 to 2003 (Tsai et al., 2007a). French values are closer to Russian values, with 7.4% of pregnant respondents consuming 5 or more alcoholic drinks on at least 1 occasion in the past 30 days (Kristjanson et al., 2007). In the Swedish study of Goransson et al.

(2003), values are higher. Forty-six percent of pregnant women reported consumption of 6 or more standard alcohol drinks once per month or less, 9% every month, and 1% every week (Goransson et al., 2003).

It is not only women who drink frequently throughout the trimesters of pregnancy trimester who greatly increase the risk of alcohol-related damage to their babies. Binge drinking may carry risks of its own, independent of overall consumption level (Barr et al., 2006; Maier and West, 2001; Ramadoss et al., 2007). Binge drinking is a pattern of alcohol consumption that is hard to stop, even during pregnancy (Dejin-Karlsson et al., 1997), and prepregnancy binge drinking decreased the alcohol cessation rate during pregnancy (Palma et al., 2007).

FAS

The primary risk factor for FAS is the consumption of large quantities of alcohol, usually in a heavy, episodic (binge) pattern, during pregnancy (Abel, 1995), as confirmed by case 2. But as shown by Abel (1995) and Abel and Hannigan (1995), both the amount and the pattern(s) of alcohol consumption are provocative factors in the etiology of FAS. Binge drinking episodes appear to be as deleterious as regular consumption (case 1). Moreover, our results seem to establish that, with a FAS prevalence of 1.8 per 1,000 births, metropolitan France is comparable with the United States, where the prevalence ranges from 0.5 to 2.0 per 1,000 births (May and Gossage, 2001). Abel (1998) wrote of the American paradox. Even though Americans have a low per capita consumption of alcohol, high rates of FAS have been reported in the United States. Binge drinking has been suggested as one major factor for the higher FAS rate (Allebeck and Olsen, 1998). Full-blown FAS is only one possible outcome of prenatal exposure to alcohol among all fetal alcohol spectrum disorders (FASD). It is reasonable to assume that the prevalence of all FASD would be 5 to 20 times higher than FAS alone, as estimated in the United States or Canada (May and Gossage, 2001).

CONCLUSION

The main finding of this study is that a large population of women in France still consume alcohol during pregnancy. These results signal the need for continued efforts to inform all women of childbearing age about the adverse effects of alcohol use on pregnancy, especially high-risk drinking patterns (i.e., binge drinking and frequent drinking), and that abstinence is the safest course of action for pregnant woman. However, knowledge about pregnancy risks from the use of alcohol [in the direction of fetal welfare (Alvik et al., 2006)] is good but not enough reason to change consumption behavior. All pregnant women should be also better screened for previous alcohol use because prepregnancy drinking greatly influences prenatal drinking (Chang et al., 2006).

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