Research Article

Alcohol risk during pregnancy in French Guiana: Distinguishing low and high risks and their covariates for prevention

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Abstract

Introduction: The consumption of alcohol during pregnancy (which is teratogenic for the fetus), and associated risk factors for prematurity, represent public health problems in French Guiana. Although there are no statistics on the consumption of alcohol by pregnant women for this French overseas territory, it is nevertheless worrying in the light of a predictive indicator-that of pre-pregnancy alcohol consumption levels measured by a T-Ace score.

Methods: A questionnaire survey was conducted in maternity wards in Guiana in 2017-2018 on the socio-demographic characteristics of women, their substance use (alcohol, tobacco, and cannabis) during and before pregnancy, and their monitoring and experience of pregnancy. This questionnaire also included T-Ace questions to determine at-risk pregnancies.

Results: Among the 789 women, 15% were at risk for alcohol consumption with a T-Ace score of 2 or more, while 7.5% were at high risk with a score of 3 or above. Two profiles of women who drank alcohol during pregnancy emerged: women with at-risk alcohol consumption which included the more educated, and that of women with a major risk including Brazilian and Surinamese women, who live in isolated zones or abroad, but also French women born in mainland France. This type of alcohol consumption during pregnancy was one of the factors explaining prematurity, which was estimated at 9% in this study of singletons births. The risk of prematurity was more than double for women with a T-Ace score above 3, the least educated, those aged 40 and over, and those living in remote areas.

Conclusion: In French Guiana, health professionals were the major source of information for women who consumed alcohol, and who did not speak French or could not read it. Increased investment in training health professionals in the mother tongues of these women so that they can explain the risks of alcohol consumption – especially beer – seems essential to improve the health of mothers and their new-borns.

INTRODUCTION

Alcohol consumption during pregnancy is a major public health concern in the world and notably in the American Latin countries [1]. Alcohol is teratogenic for the fetus, and may induce fetal alcohol spectrum disorders as shown by numerous data in the literature, and birth defects such as non-syndromic infant oral clefts or heart diseases [2-6]. As there is no research that determines a no-risk threshold for newborn health, the French prevention message, as in most countries, is to abstain from any alcoholic beverage during pregnancy, with a warning label on all alcoholic beverage containers' [7].

French Guiana is not free of alcohol consumption during pregnancy, and there are few statistical data about the alcohol drinking habits of women or pregnant ones which exist for this French overseas territory [8]. Globally, French studies assessing alcohol consumption during pregnancy that use international validated scores, such as Audit or T-Ace, are scarce [9-12]. A higher effective sensitivity for scores equal or higher than 2 was reported in many studies with regard to the T-Ace score, [13-15].

In mainland France, the prevalence of alcohol drinking during pregnancy in 2017 was estimated at 12%. This was more prevalent among older women and women with higher education. Specifically, women aged 35 and above had a 40% increased risk of drinking alcohol during pregnancy compared to the youngest group studied who were aged between 25 and 34. Furthermore, women with an educational level higher than the Baccalaureate also had an increased risk of 60%, compared to those who did not have this diploma [16]. In French Guiana today, the only available statistics concern the consumption of the total of women and it was two times lower in Guiana than in mainland for daily use, with the exception of beer drinking higher in Guiana [17]. The proximity of Brazil as one of the five highest producers of beer in the world is worth noting [1]. Thus, consumption of alcohol during pregnancy in French Guiana is of concern due to the irreversible consequences for the newborn.

Furthermore, alcohol use tends to increase among young adults in France, including young women, for whom the risk of occasional drinking is increasing. The 18 to 30 age group is more affected even though transition to adulthood moderates drinking in women, which is 28% among 18 to 24-year-olds, as compared to 19% in the group consisting of women aged 31 to 49 [18], and this overlaps with pregnancy ages. For women aged 18-24, the

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risky use of alcohol is 9% for the less educated versus 40% for those with higher levels of education [18].

Thus, alcohol drinking in pregnant women is a major risk factor for preterm births, as shown in numerous studies [19, 20]. Prematurity is also a major public health issue in this overseas territory, which is one of the most fertile in Latin America: in 2018, there were 3.56 children per woman in French Guiana versus 1.84 in mainland France [21]. The prematurity rate in Guiana is almost twice that of mainland France: 15.4 versus 7.4% [22]. Other maternal risks for prematurity are well known, and consist of such factors as: maternal age, poor socio-economic level, obesity, poor educational level, remote area of residence, consumption of other psychoactive substances, low prenatal care utilisation, and so on [23, 24].

The proximity of Brazil may also be a factor, where 10 to 25% of pregnant women use alcohol in a risky way, may be due to cultural habits shared both sides of the borders [25]. This was confirmed by another study of the Latin American Countries, which estimated alcohol consumption in pregnancy in Brazil and Suriname at 15.2% and 10.2%, respectively [1]. Notably, in all of these countries of Latin America, the prevalence of binge drinking during pregnancy is the highest in the world [2].

METHODS

Study Design

An ad hoc questionnaire was designed based on the one proposed as a self-assessment tool by the Pregnancy and Addictions Study Group (GEGA), and which was available on their website. It was adapted for local use and for the identification of migrant or cross-border population groups. Moreover, it was expanded with T-Ace questions [18], on alcohol risks. It was offered to women after delivery (usually one or two days after birth). The methodology was first described in a previous article [8].

The questionnaire was available in French, Brazilian Portuguese, Spanish, and Creole Surinamese or River Languages (Nengee); the translations were double operated by bilingual professionals using local languages. The women were asked about their mother tongue, and language groups were constructed by recoding on the basis of a table of the main languages of Guiana [19]. It was suggested that women could either complete the questionnaire by themselves, or that the interviewer could complete it with them. The vast majority of women preferred the second option. Therefore, we did not have any exclusions directly related to the language or illiteracy of the mothers as a result of the recruitment of local mother-tongue investigators, and with the help of midwives who were conversant with local languages. Formation meetings were organised with the interviewers by the research team.

The instruction for inclusion was to solicit all women present on the days of survey, excluding underage women and those who had given birth to stillborn children. Information on the purposes of the survey was provided to the women in writing or orally in a language they understood, and their consent was obtained, as requested by the Ethics Committee.

The objective regarding the number of questionnaires was defined for each of the maternity units of the department (Cayenne, Kourou, and Saint-Laurent-du-Maroni) on the basis of the birth register for 2016, which represented 57%, 6%, and 37% of births respectively. This resulted in 809 completed questionnaires. The health centres, which carry out a total of 30 deliveries per year, were not surveyed. The number of collection days required per hospital was then calculated according to the number of rooms. The distribution of the questionnaires was checked throughout the collection, in particular concerning the municipality of residence, in order to verify their representativeness. For the present analysis, the population was restricted to 789 women who gave birth to singletons.

Definitions

The incomes were grouped into three categories: work incomes (women or partners); RSA or family allowances and other assistance; and no income at all. The RSA is a national income supplement for people over 25 or those who have (or who are pregnant with) at least one child, whatever the nationality (with the exception of undocumented people).

In order to measure the risk of alcohol use, we used the T-Ace test, and defined no-risk consumption for women scoring 0 or 1. At-risk consumption for those scoring over 2 was divided in two categories: 2 and 3, or more. With regard to alcohol in pregnancy, consumption was defined as any drink during pregnancy, as the French recommendation for alcohol consumption in pregnancy is abstinence. Very few women in Guiana are smokers, and there are even fewer in pregnancy (only 2% of the women were smokers at this time, so the small numbers prevented the use of this variable).

Inadequate PCU (Prenatal care utilisation) was defined as being below the recommendations, namely eight prenatal visits and three ultrasound examinations. Specific difficulties in Guiana during the period of data collection prevented a good provision of ultrasound examinations; these were in fact reserved for the last month of pregnancy. Therefore, we decided to define inadequate utilisation as having had fewer than seven visits or the first visit after the 14th week of amenorrhea (second trimester).

Previous pregnancy terminations were totalised in the histories of abortions and miscarriages before this pregnancy, as some women hardly differentiate the two phenomena.

Statistical Analyses

The data were digitised by the research team and analysed with Modalisa8 and SPSS18, using crossed tables. All comparisons in this article were significant (p < 0.001), unless otherwise stated. Data on T-Ace scores were expressed in four groups reflecting the risk as mentioned above: 0; 1; 2; 3+. A first multivariate logistic regression was carried out using age groups, educational level, residence, maternal language, and pregnancy monitoring as variables to test the risk of alcohol. A second regression used the same variables and T-Ace score to test the prematurity of the newborns.

Ethics

The questionnaire was strictly anonymous; only the year

of birth of the mother was collected; questions regarding her complete date of birth and that of the child did not appear on the questionnaire. The Ethics Committee of Paris Descartes University (CERES) validated the questionnaire as well as the procurement procedures (Decision 2017-25), and a simplified declaration was submitted to the French National Board of Ethics, CNIL (n°2081716).

RESULTS

Alcohol consumption throughout the women's lives was distinguished in four classes: almost half of the women declared that they never drank, or only took small quantities on occasions; 28% had a T-Ace score measured at 1; 15 % at 2; and finally 7.5% were incurring a major risk as they scored at 3 or more. The women's ages had no influence on the T-Ace score (Table 1). Their educational level indicated two effects: the less educated women either did not drink at all, or engaged in at-risk consumption with a score above 3. Conversely, the women

with a baccalaureate or higher had a higher risk of scoring 1 or 2. While the Haitian women mostly did not drink, the Brazilian and Surinamese women, who lived in isolated towns or foreign countries, had the highest lifetime risk measured by a T-Ace score of above 3, in addition to French women born in mainland France, or out of Guiana. At-risk consumption was also associated with poor prenatal care utilisation and more than one previous pregnancy termination.

The T-Ace score on life risk was completed with an evaluation of the consumption before pregnancy, which gave more or less the same results, but with slight differences: 5% with a T-Ace of 0 declared light consumption. Among the women with a T-Ace score of 3 or more, the quantities were equally distributed among the various frequencies, but those who said that they drank more than once a week were more than five times likely to be represented. More than eight in ten women declared that they did not drink during pregnancy, but almost 18% had a least one drink, of which about 9% drunk once a month or more.

Table 1: Socio-demographic characteristics of the 789 women according to their T-Ace score.

T-ACE	0	1	2	3 or more	Total
N (%)	49.2	28.3	15.1	7.5	100
Maternal age ns					
<20	8	6.3	10.1	5.1	7.6
20-40	84.5	88.3	84.9	91.5	86.2
40 or more	7	5.4	3.4	1.7	5.6
Education Level***					
None	6.7	2.7	3.4	8.5	5.2
< 8 years	37.1	29.1	21.8	30.5	32.1
8-11 years	27.1	20.6	30.3	30.5	26
Baccalaureate or higher	29.1	46.6	42.9	30.5	36.2
Nationality and birthplace ***					
French born in Guiana	66.8	43.5	43.7	42.4	54.9
French born elsewhere	31.4	46.2	42	52.5	38.8
Foreign	1.8	10.3	14.3	5.1	6.3
Nationality if foreigner***					
Haitian	56.4	37.1	38.5	12	47.3
Brazilian	6.9	9.3	3.8	28	8.3
South America	5.8	5.2	21.2	12	7.9
Surinamese	29	46.4	36.5	48	34.9
Another	1.9	2.1	-		1.6
Residence*					
Isolated towns or other country	16	18.4	21	30.5	18.5
Cayenne area	27.1	32.3	28.6	18.6	28.2
Saint-Laurent area	56.8	49.3	50.4	50.8	53.3
Income**					
None	10.8	4.5	4.2	3.4	7.5
Work (woman or couple)	40.7	55.2	47.9	47.5	46.4
RSA and allowances	32.7	30	27.7	45.8	32.2
Another income	14.2	9.9	18.5	3.4	7.5
Prenatal Care Utilisation***					
Late, insufficient, or poor	33.1	29	34.2	54.5	33.7
Adequate	66.9	71	65.8	45.5	66.3
Previous pregnancy termination *					
None	77.6	70.4	76.5	64.4	74.4
One or more	22.4	29.6	23.5	35.6	25.6
ns=non-significant *p<0.05 or **p<0.01 ***p<0.001					

Table 2: Substance use and information according to T-Ace score.

T-ACE	0	1	2	3 or more	Total
Alcohol Consumption before pregnancy *					
No	95	4.1	0.9		47.9
Yes, on occasions or at parties	3.1	70.1	51.3	35.6	31.8
Yes, once a month or a week	1	24.4	34.2	37.3	15.4
Yes, several times a week or every day	0.8	1.4	13.7	27.1	4.9
Alcohol Consumption during pregnancy *					
No	96.6	76.7	58.8	58.6	82.4
Yes, on occasions or at parties	1.3	14.3	20.2	15.5	8.9
Yes, once a month or more	2.1	9	21.1	25.9	8.7
Tobacco smoking before pregnancy *					
<1	99	93.7	85.5	75	93.7
1 or more	1	6.3	14.5	25	6.3
Tobacco smoking during pregnancy *					
<1	100	97.7	95.8	89.7	98
1 or more		2.3	4.2	10.3	2
**Other consumption **					
Cannabis or kali	1.8	16	15.2	23.6	9.4
Ecstasy /MDMA /LSD /another drug		1.1	3	10.9	1.6
Crack /cocaine		0.6	1	5.5	0.7
None	98.2	82.3	80.8	60	88.2
Information about alcohol during pregnancy*					
None	43.7	27.8	23.4	20.2	34
Internet/the media	11.6	17.3	10.4	13.1	13.2
Family or friends	11.4	9.8	9.1	19	11.2
Prevention campaigns, school	10.8	18.3	22.1	6	14.3
Health professional	22.6	26.8	35.1	41.7	27.3
Has a professional asked you about alcohol?					
Yes	73.5	81.2	80.5	88.1	77.9
No	26.5	18.8	19.5	11.9	22.1
ns=non-significant *p<0.05 or **p<0.01 ***p<0.001					

The link with tobacco smoking and cannabis use was also worth noting, as the most at risk women combined the consumption of these substances.

The women with a high T-Ace score were more often given information on alcohol and pregnancy by professionals, however they were less affected by campaigns and information at school (Table 2).

Using a regression logistic model, the influence of the different variables was tested to explain prematurity, which affected 9% of singleton newborns (Table 3). Controlling for age, residence, maternal language, educational level, prenatal care utilisation, and T-Ace, the risk of premature birth was 2.7 times higher for women above 40 years, 2.168 for those living in remote areas, 2.16 for those with a low educational level, and 2.58 for women with a T-Ace above 3.

DISCUSSION AND CONCLUSION

The potential limitations of this study are of course the reluctance of participants to declare their alcohol use, notably while pregnant, due to stigmatisation or shame [26, 27]. The alcohol consumption over a lifetime was demonstrated as predictive of the alcohol use during pregnancy [12]. Studies confirm that consumption of over two drinks before pregnancy is a predictor of the amount of alcohol drunk during pregnancy [12]. Therefore, the utilisation of the T-Ace score for routine screening in maternity units is highly recommended in the literature, also supplemented with other sources as we did [14]. Consumption during pregnancy is under reported, so that screening over a lifetime is a better indication of the risk level. We found that 22.6% of the delivered women had a positive score of 2 or above at the T-Ace screening, as compared to 21.2% in a comparable population in Zambia [28], and 22% in Brazil [25].

The preterm birth rate is higher in Guiana than in other parts of France, notably the mainland. It has diminished in the last 20 years, but remains multifactorial due to unemployment, poor prenatal care utilisation, anaemia, dengue, teen pregnancies, and so on [29]. The risks associated with behaviours were not assessed in this previous study using the births register.

With regard to alcohol use, the risk of prematurity was unclear using a T-Ace cut-off at 2, and in bivariate cross tables. As the scores at 1 or 2 mixed women with low or high education level, from mainland or isolated towns, but with a good prenatal care utilisation, the effect of their drinking was not significant on their preterm deliveries. The choice of using a cut-off at 3 enabled the identification of the women really at risk. The risk of prematurity was doubled with a T-Ace score of 3 or more concerning women

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Table 3: Odds ratio for logistical regression to explain prematurity.	
	Prematurity
N (%)	63 (9%)
Maternal age	
<20	1.126
20-40	1
40 and more	2.709**
Residence	
Isolated township	2.168*
Saint-Laurent and suburb	1.73
Abroad	0.961
Cayenne and suburb	1
Maternal language	
French Creole	1
Portuguese and Amerindian languages	1.275
English Creole-River	0.708
French-European and Asian languages	0.851
Education Level	
None	1.895
Primary or secondary	2.155**
Baccalaureate or higher	1
Prenatal care utilisation	
Late, insufficient, or poor	1.636*
Adequate	1
T-Ace	
0	1
1	1.37
2	1.017
3 or more	2.582**
***p<0.001 **p<0.01 *p<0.05	

with regular use of alcohol and a poor prenatal monitoring.

The professionals who asked women about their alcohol consumption during their pregnancy tended to inform women with a high risk about alcohol (3 and more), whose socio-demographic profile converged with their representations of risk behaviours [30]. However, the women with higher levels of education, who were engaged in a profession with an income, were less warned about the risks of drinking at parties or on occasions, and specifically about binge drinking [2], as they were supposed to have had access to the information through the Internet or the media. The last surveys confirmed that upper-class working women drunk in a consistently more risky manner than the other groups. Thus, it can be concluded that education level is strongly linked to alcohol risk, both rising together [18]. The more educated women tend to discuss more the prevention norms (abstinence), and to adopt behaviours closer to those of men [18, 31]. The association between drinking and smoking tobacco or cannabis is well established, and constitutes a new risk for pregnancies in younger women [32, 33]. With regard to this, some disparities were noted in the level of information given by the hospitals, less information was given in the hospital with the more educated patients.

The prematurity level was strongly linked to multiple pregnancies, and to avoid this bias we chose to measure it by studying only singleton births. The results showed that a link between prematurity and a T-Ace score of above 3 was worth noting (17.2 versus 8.4%) while it was not significant with a cut-off at 2, due to the aggregation of contrasted sub populations, such as women with low education living on allowances in isolated towns on the one hand, and highly educated professional women who indulged in festive drinking on the other.

Since 2002, in France, the recommendation has been to abstain from drinking alcohol during pregnancy, and a warning label is put on every container of alcoholic beverage in the territory [7]. However, in French Guiana, a large part of the alcohol drunk in the isolated territories on the borders could not conform to this law, as it was produced abroad. Education during pregnancy remains essential in Guiana where low educational levels, residential isolation, and a plurality of maternal languages weaken the impact of prevention via campaigns and the media. Information about this prohibition is present in the pregnancy notebook distributed to every pregnant woman. The page dedicated to risky behaviours includes alcohol, tobacco, pemba (kaolin), and illicit drugs in the form of a prohibition, like a road sign [34]. No explanation about the risks is provided. Some posters with the same presentation are displayed on the walls of the maternity units.

The main provider for information about the risks of alcohol remains the maternity staff. Moreover, this is particularly the case for the less educated women who have no access to written French or other languages, because of a different maternal language or because they cannot read at all [35]. The influence of treatment providers is based on their own basic beliefs about alcohol use disorders and which people is concerned [36]. Further efforts made by staff to speak the main river languages are to be encouraged, but the difficulties should be recognised of respecting the national French standards for pregnancy monitoring as for other pathologies [37], along with not having enough time (or fluency) to explain the risks of alcohol consumption, notably that of beer, to the women while giving prenatal care. The pregnancy period is considered to be a good time to provide information about drinking, as the mothers-to-be are receptive to the best guidelines for their babies' health [26]. The education to the risks of alcohol during pregnancy should be a priority for all professionals taking in care women regardless their social level, and the T-Ace questions should be used to address this topic and explain the risks for their newborns. The mere prohibition of alcohol consumption during pregnancy clashes with cultural norms around this product and cannot replace a discussion of real risks, a subject to which pregnant women are sensitive.

FUNDINGS

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