

Reduced prevalence of fetal exposure to alcohol in Italy: a nationwide survey



OBJECTIVE: Ethyl glucuronide (EtG) is a direct metabolite of ethanol and is widely accepted as a reliable biomarker for the assessment of gestational consumption when measured in maternal hair and prenatal exposure to alcohol when measured in neonatal meconium. It has been shown that maternal self-reports on drinking habits during pregnancy are misleading and unreliable for various reasons, including recall bias, shame, and/or fear of stigma. In this concern, the objective assessment of real alcohol consumption through the measurement of EtG is preferable.¹

In 2010, a multicenter study was conducted in 7 neonatology wards throughout Italy to assess prenatal exposure to alcohol through the measurement of EtG in neonatal meconium.² In 20% to 30% of pregnant women that self-reported one or more drinking occasions during pregnancy, the overall prevalence of 607 newborns prenatally exposed to gestational alcohol was 7.9%, ranging from 0% and 10% along the Italian peninsula with an isolated maximum value of 29.4% in Rome, the country capital. After a decade, a national project “Prevention and Diagnosis of Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Spectrum Disorder (FASD)” was conducted not only to objectively assess fetal exposure to maternal alcohol through meconium EtG testing but also to verify gestational alcohol consumption through EtG measurement in maternal hair corresponding to pregnancy period (a 9-cm hair strand).³

STUDY DESIGN: A total of 53 Italian neonatology wards and 47 maternity wards covering the entire national territory (Figure) provided, between 2020 and 2022, 1489 meconium samples and 1279 nonpaired maternal hair collected at delivery, without anyone refusing to participate in the study or anyone being excluded. Hospitals started hair and meconium collection once they obtained approval from local ethics committees and when regional COVID-19 restrictions were slowly being lifted in a limited timeframe to obtain at least 20 samples per matrix.

Participating women underwent full clinical examination and responded to a medical questionnaire, which included data about maternal sociodemographic characteristics and drinking habits during pregnancy. EtG was measured in neonatal meconium and maternal hair using previously published analytical procedures.^{4,5} The study received approval from the local ethics committee (protocol number: AOO-ISS 27/11/2019/0035819).

Following the Society of Hair Testing guidelines, EtG concentrations of ≤ 5 , >5 to ≤ 30 , and >30 pg/mg were the cutoffs

for hair samples to indicate total abstinence from alcohol, social drinking, and chronic excessive alcohol consumption, respectively,⁶ and an EtG concentration of 30 pg/mg was the cutoff for meconium samples to indicate fetal exposure to gestational alcohol.⁷

Statistical analyses were performed using SPSS (version 27.0; IBM Corporation, Armonk, NY). A nonparametric Kruskal-Wallis test was performed. Only complete questionnaires were considered for statistical analysis.

RESULTS: The sociodemographic analysis of the mothers was as follows: 43.2% had tertiary education, 39.3% had secondary education, 36.2% were administrative employees, 10.4% were senior managers, 16.2% were unemployed, and 10.3% were homemakers. With a mean age of 34.0 ± 5.2 years and a planned pregnancy rate of 71.5%, most participants were Italian (88.00%), 3.40% were from other European countries, and 7.80% were from non-European countries. According to internationally established cutoff standards,⁶ maternal analysis of hair EtG showed that 94.06% of women remained abstinent during the whole pregnancy, 5.79% of women were social drinkers, and 0.16% of women presented chronic excessive alcohol consumption. The correlation between self-reported alcohol use and measured hair EtG was not performed because of fragmentary responses on drinking habits in most items of the questionnaire. Nevertheless, it has to be said that most of the women declared 1 drink per month or less during pregnancy. This is in line with the nonquantifiable amount of hair EtG in more than 90% of cases, as reported above.

Sociodemographic characteristics of the 3 defined groups did not show any statistically significant difference (Table), even though the incongruous size of samples should be recognized with the abstinent women being the predominant group among study participants.

EtG measurement in nonpaired meconium samples indicated a 0.74% prenatal exposure to gestational alcohol; however, 99.93% of newborns were unexposed to alcohol. Furthermore, no statistically significant difference in neonatal features was apparent between exposed and unexposed newborns. A previous investigation from the same research group demonstrated that an EtG level of >11 pg/mg in maternal hair during the second and third trimesters of pregnancy could predict prenatal ethanol exposure with a sensitivity of 85.7% and a specificity of 73.7%. Although the examined hair strand corresponded only to the last 2 trimesters of pregnancies in a cohort of paired mother-infant dyads, the obtained results reinforce the evidence that a very small percentage of women drinking during pregnancy in Italy reflects a negligible

FIGURE

Geographic distribution of Italian hospitals providing meconium and maternal hair samples

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percentage of nonpaired newborns exposed to alcohol in the same territory.

CONCLUSION: Our results revealed a currently reduced prevalence of alcohol consumption during pregnancy in Italy and, consequently, a decreasing rate of prenatal exposure to ethanol.

In addition, the findings are in line with the result that 12.1% of pregnant women self-reporting alcohol consumption at least 1 time during pregnancy in 2020–2021 compared with 30.2% of pregnant women self-reporting alcohol consumption at least 1 time during pregnancy in 2011–2014.

In the last decade, nationwide “no-alcohol during pregnancy” prevention strategies have been implemented, including information and/or education campaigns promoting complete abstinence to prevent FAS and FASD.^{8–10} In addition, in regional prevention plans, training programs have been set up for health professionals’ information and women’s support to maintain a healthy lifestyle during the gestation period. Overall, all these initiatives could have raised awareness about the risks of drinking during pregnancy.

Nevertheless, an alarming increase in risky consumers and binge drinkers was recently observed for young women aged 18 to 24 years.¹¹ As participants in our survey were not selected by age, and as only 5.8% were in the 18- to 24-year age group, a future perspective is to plan a specific project

selecting only young women of childbearing age and assessing EtG levels in hair and meconium of mother-infant dyads.

Finally, we advocate for education campaigns on the risks of drinking during pregnancy to be organized in secondary schools and universities and for awareness-raising initiatives in recreational settings for young people.

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TABLE

Sociodemographic characteristics associated with alcohol consumption during pregnancy measured by hair and meconium

Characteristics	Abstinent (n=1199) ^a	Social drinkers (n=74)	Excessive drinkers (n=2)
Nationality, %			
Italian	88.6	92.0	50.0
European	3.4	3.0	0.0
Not European	8.0	6.0	50.0
Age, mean (SD)	33.8 (5.3)	35.0 (5.0)	29.0 (0.0)
Academic level, %			
No formal education	0.0	0.0	50.0
Primary school	0.3	1.0	0.0
Secondary school	11.8	11.0	0.0
High school	39.5	37.0	0.0
Graduated	42.8	50.0	50.0
PhD or postgraduate specialization school	4.3	1.0	0.0
NR	1.3	0.0	0.0
Professional occupation, %			
Homemaker	9.8	7.0	0.0
Student	1.0	0.0	50.0
Employed	71.9	77.0	0.0
Unemployed	16.0	16.0	50.0
Unable to work	0.1	0.0	0.0
NR	1.3	0.0	0.0
Newborn characteristics	Unexposed (n=1394) ^b	Exposed (n=9) ^b	
Gestational age (wk), mean (SD)	39.3 (1.4)	39.0 (0.8)	
Birthweight (g), mean (SD)	3311 (926)	3149 (378)	
Birth height (cm), mean (SD)	49.9 (2.0)	50.0 (1.8)	
Head circumference (cm), mean (SD)	34.3 (1.5)	34.0 (1.5)	

NR, not reported; SD, standard deviation.

^a There are 80 missing questionnaires among abstinent women; ^b There are 84 missing data among unexposed newborns and 2 among exposed newborns.La Maida N. Reduced rate of fetal exposure to alcohol. *Am J Obstet Gynecol MFM* 2023.

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