

Short communication

Early alcohol or tobacco onset and transition to other drug use among students in the State of Morelos, Mexico

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Abstract

In this study, we explored if patterns in the transition from alcohol/tobacco in the Mexican State of Morelos, Mexico are similar to those observed in other countries. Methods: The data were from a representative sample of youth age 11–21 years ($n = 13,105$), who participated in a paper-and-pencil survey in middle schools, high schools, and colleges in the State of Morelos, Mexico. Drug use was assessed via the standardized instrument mostly used in Mexican student surveys. Cox's models for discrete time–survival analyses, stratified by school and age group were used to estimate the risk of drug use in relation to age of alcohol and tobacco use initiation by gender, while accommodating the complex survey design. Results: About 5% of the students were estimated to have used drugs in their life. Male early users of alcohol or tobacco were more likely to use other drugs, compared to students who did not have an early alcohol or tobacco onset. Comment: Further studies on social mechanisms might help to account for observed similarities in patterns of drug involvement in different countries, even in the context of important differences in rates of drug use.

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1. Introduction

Very little information is available in the peer-reviewed literature with regard to drug-use initiation and transitions among youth from developing countries in Latin America. A notable exception is the study by Vega and colleagues (2002), in which prevalence and onset age for drug use across six international sites were reported, the study population for the Mexican site including residents of the federal district of Mexico City 18–65 years old. Interestingly, lower rates of alcohol and other drug use were found in the Mexican site compared to all other sites. Given other observations indicating that early alcohol and tobacco use is associated with later

use of other drugs such as marijuana, cocaine, and heroin (Kandel, 1975; DeWit et al., 2000; Kosterman et al., 2000), in the present study, we explore if similar patterns in the transition from alcohol/tobacco occur in a representative sample of school-attending youth in the Mexican State of Morelos and the sub-group variation by sex on the risk for drug use transitions.

2. Methods

The data are from the study “Lifestyles of adolescent and young adults and their association with the longitudinal development of chronic diseases” conducted among a representative sample of all public middle through college schools of the State of Morelos, Mexico, between 1998 and 1999

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(Lazcano-Ponce et al., 2003; Herrera-Vazquez et al., 2004). The IRB at the National Institute of Public Health (Mexico) approved the protocol and instruments for the study. After informed consent was obtained, a total of 13,105 students (7380 females and 5725 males, 11–21 year old) were given self-administered questionnaires, achieving a 98.6% response rate. Drug use was assessed via the same standardized instrument used in most Mexican student surveys (Medina-Mora et al., 1981; Secretaría de and Salud, 1998), with questions about use of marijuana, inhalants, cocaine, heroin, and other illegal or non-prescribed substances, hereafter referred as drugs. However, age-of-onset data were only available for alcohol, tobacco, and other drugs in general, without specification by drug type. Gateway models of drug use describe alcohol or tobacco use as an initial stage of drug involvement, and therefore the study sought to analyze the association between early alcohol and/or tobacco and other drug use. Due to the strong correlation between alcohol and tobacco use, separate analyses for each drug lead to similar inferences. Early onset of alcohol or tobacco use was defined as first use by age 14 years (Kandel and Logan, 1984; Janson, 1992; Anthony and Petronis, 1995; Grant and Dawson, 1997; DeWit et al., 2000). The original data were re-organized into person-year records for life table and survival analysis. Cox's models for discrete-time survival analyses, stratified by school, age

group, and socio-economic status, and with terms to capture subgroup variation by sex were used to estimate the risk of drug use associated with early alcohol and tobacco use initiation, while accommodating the complex survey design (Wilcox et al., 2002; Wagner and Anthony, 2002; Herrera-Vazquez et al., 2004).

3. Results

Table 1, panel "A" describes the cross-sectional, unadjusted association between sample characteristics and drug use. About five out of 100 students were estimated to have used drugs in their life. Youth who had an early onset of alcohol/tobacco use were more likely to have used other drugs. An estimated 16% of males and 4% of females who had used alcohol/tobacco before age of 14 transitioned to use of other drugs. Male early alcohol/tobacco use, high socioeconomic status, being older, and residing in an urban area were characteristics associated with higher odds of drug use.

Fig. 1 depicts the cumulative probability of starting to use drugs by groups defined in reference to early or later alcohol/tobacco use and sex. The cumulative probability of drug use is higher for early alcohol/tobacco users, and for males, in general, regardless of their early alcohol/tobacco

Table 1
Sample characteristics and drug use among students in Morelos State, Mexico ($n = 13,105$)^a

Characteristics	Total (n)	Drug use initiation, unadjusted, (Panel "A")					Drug use initiation, adjusted (Panel "B")		
		Yes	wt.% ^b	OR ^b	95% CI	P value	HR ^c	95% CI	P value
All	13105	565	4.9	NA			NA		
Early alc/tob onset by sex ^d									
Early onset, males	1379	183	16.5	6.6	1.9, 6.9	<0.001	3.4	2.7, 4.1	<0.001
Early onset, females	949	42	3.8	0.7	0.6, 1.2	0.282	1.0	0.7, 1.5	0.785
No early onset, females	6341	109	1.8	0.3	0.4, 1.3	<0.001	0.3	0.3, 0.4	<0.001
No early onset, males	4346	231	5.2	1.0	–	–	1.0	–	–
Socioeconomic level									
High	2980	188	7.8	2.8	1.5, 5.2	0.002	1.4	1.0, 2.0	0.037
Medium	6815	278	4.2	1.4	1.0, 2.1	0.066	1.2	0.9, 1.7	0.158
Low	3310	99	3.0	1.0	–	–	1.0	–	–
Age									
15	837	34	4.1	1.1	0.6, 1.8	0.797	Fixed by stratification		
16-18	1879	105	5.6	1.3	0.8, 2.3	0.321	Fixed by stratification		
19-21	616	58	9.4	5.1	1.9, 13.8	0.002	Fixed by stratification		
11-14 years	9773	368	3.8	1.0	–	–	Fixed by stratification		
Schooling									
High-school, college	2417	159	6.6	2.2	1.2, 24.0	0.013	Fixed by stratification		
Middle-school	10688	406	3.8	1.0	–	–			
Type of residence									
Urban	4607	290	6.3	2.6	1.6, 4.3	<0.001	Fixed by stratification		
Semi-Urban	3246	121	3.7	1.3	0.9, 1.9	0.180	Fixed by stratification		
Rural	5252	154	2.9	1.0	–	–	Fixed by stratification		

^a Drug use includes marijuana, cocaine, inhalants, heroin, and other illegal or non-prescribed substances.

^b Crude, unadjusted weighted percentage of ever use, OR= Odds Ratio, based upon unadjusted, weighted analyses.

^c HR: Hazard ratio, based upon discrete-time survival analysis adjusting simultaneously for covariates, and stratifying by school and period of time at risk.

^d First alcohol/tobacco use by age 14.

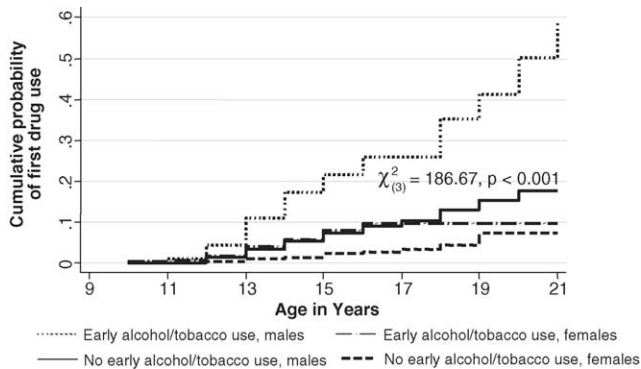


Fig. 1. Cumulative probability of first drug use by alcohol/tobacco use status and sex. Data from students in Morelos, Mexico ($n = 13,105$).

use. By age of 15, one in five males (20%) with early alcohol/tobacco use used drugs, while only one in 12 males (8%) used drugs among those with no early alcohol/tobacco use. Also, by age of 15, an estimated 8% of the females with early alcohol/tobacco use used drugs as compared to 2% of females who did not use alcohol or tobacco before the age of 14.

Results from a Cox regression model depicted in Panel “B” in Table 1 show that male early alcohol/tobacco users were three-fold more likely to use drugs compared with males who did not have early alcohol/tobacco use (HR = 3.4; 95% CI = 2.7, 4.1); females who did not have early alcohol/tobacco use were estimated to be more likely to remain non-drug users (HR = 0.3; 95% CI = 0.3, 0.4). No statistically significant difference was found in the risk of drug use between female early users of alcohol/tobacco and male non-early alcohol/tobacco users (HR = 1.0; 95% CI = 0.7, 1.5, $P > 0.784$), controlling for socioeconomic status and holding constant other potential confounders such as age at assessment and school (indirectly controlling for school type, and urban residency).

4. Discussion

This study shows that early onset use of alcohol/tobacco is associated with excess risk of drug use among students of Morelos, Mexico, and that the risk is higher for males, especially if they have used alcohol or tobacco. However, the sample was restricted to public-school-attending youth. It is estimated that between 33 and 50% of youth in Morelos, Mexico do not attain middle school or a higher education degree, and therefore were not included in the sampling frame of the study (Banamex, 1998). Another important limitation of the present study is the lack of information on onset age for specific drugs or drug groups, such as marijuana, inhalants, and cocaine, among others.

Notwithstanding these important limitations, the study offers novel evidence with regard to youthful drug involvement that might apply to students in Morelos and other Mexican States and Latin American countries. As is the case for other countries, male early users of alcohol and/or tobacco were

found to be at higher risk of progressing into use of other drugs. While this observation is consistent with gateway models and patterns of drug use observed in other countries (Vega et al., 2002), it may be necessary to look at social mechanisms that might account for gender disparities in the risk of drug use (Morrall et al., 2002; Anthony, 2002; Lynskey et al., 2003). In particular, it is puzzling that early use versus non-early use of alcohol or tobacco was found to be associated with higher risk of drug use among males but not among females. Accumulating evidence supports the idea that male–female differences in drug use can be traced back to differences in exposure to opportunities to use drugs (Van Etten et al., 1997, 1999; Van Etten and Anthony, 2001; Wagner and Anthony, 2002; Wagner et al., 2003).

It is possible to argue that regional patterns of drug use also influence the likelihood of drug initiation and transitions to different types of drugs. A significant feature of the present study is its stratification of students by school, which provides control for regional and local differences, such as alcohol/tobacco use school policies. The importance of further research on regional and local differences is highlighted by some of the findings in the present study that show greater occurrence of drug use among youth in the highest socioeconomic status and among those residing in urban locations. In the future, the study of variation of drug-use exposure opportunities can help understand better similarities and differences in rates of drug use across regions and countries, and the mechanisms that may account for such differences (Caris et al., in press). For example, it is possible that urban residency is related to increased opportunities for early alcohol, tobacco, and other drug use, and that the transition opportunity of actual drug use occurs more often and more rapidly.

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