HHS Public Access

Author manuscript

J Agromedicine. Author manuscript; available in PMC 2019 September 24.

Published in final edited form as:

J Agromedicine. 2003 ; 9(1): 83–91. doi:10.1300/J096v09n01_08.

Tobacco Use Among Mexican Farmworkers Working in Tobacco: Implications for Agromedicine

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Abstract

This survey evaluated tobacco use of migrant tobacco workers in eastern North Carolina. Sixty-nine (38%) out of 181 mostly male, Mexican farmworkers were smokers. Compared to non-smokers, three times more smokers reported alcohol use in the past week (p =0.002). More smokers compared to non-smokers reported poor to fair health, and fewer had worked previously in tobacco agriculture, but these differences were not statistically significant. Also not statistically significant, those smokers who were older and those who understood the most English smoked more cigarettes per day. Because farmworkers are exposed to many non-tobacco respiratory irritants, and because of the health risks of smoking, those who smoke should be urged to quit.

Keywords

Migrant farmworkers; tobacco use; cigarette smoking; tobacco agriculture; Hispanics

Cigarette smoking is the leading cause of preventable death in the U.S., responsible for over 400,000 deaths per year.[1] While the tobacco use patterns of American non-Hispanic whites and blacks have been well documented for decades[2] less is known regarding tobacco use among other racial groups and ethnic minorities, including Hispanics. Further, no data exist on the smoking habits of migrant farmworkers, most of whom in the U.S. are Hispanic.[3] The current study on farm-workers' tobacco use was part of a longitudinal National Institute of Occupational Safety and Health-sponsored study to estimate the incidence and prevalence of green tobacco sickness among tobacco farm-workers in eastern North Carolina.[4,5] This disorder is a form of acute nicotine poisoning caused by occupational exposure to tobacco leaves. For the current study on tobacco use, we administered a baseline survey during the tobacco growing season of 1999 eliciting information on use of tobacco products by Mexican migrant farmworkers. Since agricultural workers are exposed to numerous respiratory irritants,[6] and since these irritants can worsen pulmonary function especially among farm-workers who smoke,[7] the objective of this study was to estimate the point prevalence and correlates of tobacco use among immigrant Mexican farmworkers.

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METHODS

From lists of an estimated 200 active residence sites compiled by local migrant health centers, 37 migrant camps were randomly selected. One hundred eighty-seven workers who were approached agreed to participate; all but one were Mexican (see Arcury et al.[4] for a more detailed description of sample recruitment). After initial examination of work experience data, 5 workers had no field exposure to tobacco and were excluded from the Green Tobacco Sickness study, leaving 178 Mexican men, 3 Mexican women and 1 American non-Hispanic white man. Since this report focuses on Mexican farmworkers, this latter participant was excluded from these analyses for a final sample size of 181.

A baseline questionnaire was administered in Spanish by Spanish-speaking research assistants, eliciting information on self-reported health, educational attainment, marital status, self-reported English comprehension, prior work in tobacco agriculture, and alcohol and tobacco use. Education was divided into approximate tertiles of < 6 years, 6 years or > 6 years. Due to the small numbers of separated or divorced individuals (< 2%), marital status was divided into married or not currently married, the latter including those who were separated, divorced or never married. Individuals were asked to rate their health as poor, fair, good, very good or excellent. These categories were collapsed into poor or fair, good, or very good or excellent. As one measure of acculturation, participants were asked how many years they had worked in the U.S.; and this was divided into ≤ 1 year, 2–5 years, and ≥ 6 years. To determine if there was a relationship between prior farm work in tobacco and smoking status, participants were asked if they had previously worked in tobacco agriculture, and if they had, for how many years. Acculturation was also determined by asking if Spanish was spoken at home as well as by the worker's self-reported level of English comprehension. Because few workers understood English well, this category was divided into none, very little, or some, most or all.

Data collected on smoking were dictated by the needs of the green tobacco sickness study (i.e., to understand effects of smoking on salivary cotinine relative to dermal exposure to green tobacco leaves). There-fore, the definitions of smoking status differ slightly from those typically used in smoking research. Current smoking was determined by asking, "How many cigarettes have you smoked a day within the past 7 days?" Those who answered none were defined as non-smokers, and those who answered one or more were defined as current smokers. Similarly, individuals were asked about the amount of alcohol, cigar or smokeless tobacco used in the past 7 days. Alcohol use included beer, wine and liquor and was divided into no drinks in the past 7 days, one drink in the past 7 days, or 2 or more drinks in the past 7 days. Mantel-Haenszel chi-square tests for association of variables with smoking were calculated treating work sites as strata (see reference 4 for more details); 95% CIs were calculated to account for intra-camp correlation of smoking behavior that occurred from cluster sampling.[8]

RESULTS

Summary characteristics by smoking status are listed in Table 1. There were 112 non-smokers (61.8%) and 69 smokers (38.1%). All but 3 participants were male; average age

was 31 years old. The majority (75.3%) of participants were married, and rated their health as good, very good or excellent. Most participants understood very little or no English, with 92% speaking Spanish at home and 8% speaking an Indian language at home. Very few participants used other forms of tobacco besides cigarettes: 2 participants used smokeless tobacco in the past 7 days, and 5 participants smoked cigars in the past 7 days (3 of the latter also smoked cigarettes). Only 23% of participants had drunk alcohol in the past week (16.6% reported 1 drink; 6.6% reported 2 or more drinks).

Three times more smokers reported 1 or 2 drinks in the past week than non-smokers (30.4% vs. 8.0% for 1 drink; 11.4% vs. 3.6% for 2 drinks; $p = 0.002$). In addition, a higher percentage of smokers had less than 6 years of education compared to non-smokers (43.5% vs. 25.9%), but this was not statistically significant. The percent of smokers who reported poor or fair health was over twice that of non-smokers (18.8% vs. 8.0%, $p = 0.09$). A higher percentage of non-smokers than smokers had worked in tobacco agriculture previously (72.3% vs. 59.4%), which also was not statistically significant. Among these workers, smokers had worked more seasons in tobacco (6.1 ± 0.8 vs. 4.6 ± 0.4, $p = 0.052$). There were small, non-significant differences between smokers and non-smokers in terms of their age, gender, marital status, English comprehension, and whether Spanish was spoken at home.

The average number of cigarettes smoked per day among farmworkers was 4.7 ± 0.5, with the oldest smokers (≥ 34 years old) smoking nearly twice as many cigarettes daily (6.0 ± 1.0 per day) as the youngest workers (≤ 26 years old, 3.1 ± 0.6 cigarettes per day). In addition, workers who understood the most English (“some/most/all”) smoked over 11/2 times more cigarettes than those who understood no English (6.7 ± 2.6 vs. 4.4 ± 0.6 cigarettes per day). None of these differences was statistically significant.

DISCUSSION

This study is the first to report cigarette smoking, smokeless tobacco use and cigar smoking among Mexican migrant farmworkers in the U.S. Although much is known regarding the epidemiology of tobacco use among other racial and ethnic groups, less is known regarding the smoking patterns among Mexicans residing in the U.S. Indeed, the ethnic category of Hispanic was not added to national surveys until 1978. One previous study[7] reported the prevalence of current, former and never smoking among Hispanic farmworkers (29%, 17% and 54%, respectively). The prevalence of current smoking among these Mexican farmworkers (38.1%) is higher than that report and also stands in contrast to the prevalence among Hispanic men in the National Health Interview Survey (22.9%) for 1994–1995.[2] On the other hand, the smoking prevalence (38.5%) in this report is closer to the prevalence of current smoking reported among Hispanic men participating in the 1982–1984 Hispanic Health and Examination Surveys[9] (HHANES, 44%), which had a higher likelihood of capturing recent Hispanic immigrants to the U.S.[2] The average number of cigarettes smoked per day among these farmworkers is low compared to non-Hispanic white and black individuals who smoke,[2] but is consistent with that found among Mexican American current smokers nationally.[10] Because Mexican Americans have lighter smoking patterns and their smoking results in lower serum cotinine levels for the same amount of tobacco product used

than other populations nationally,[9,10] they may be less likely to have high levels of nicotine addiction. The low-intensity smoking patterns among farm-workers in our study are consistent with this idea of lower risk for nicotine addiction. These findings might have implications for tobacco cessation interventions among Mexican farmworkers, since smoking cessation success is related to levels of nicotine addiction.[2]

Some amount of the low-intensity smoking among these farmworkers might be related to working in tobacco agriculture. If farmworkers who work in tobacco fields have learned that tobacco use accustoms them to nicotine, they might be smoking to avoid green tobacco sickness. This form of acute nicotine poisoning due to transdermal absorption of nicotine from tobacco leaves causes headache, dizziness, nausea and vomiting among affected tobacco farmworkers.[4,5] Employers and coworkers encourage workers to smoke to avoid these symptoms (Thomas A. Arcury, unpublished data). Because workers are paid only when they work and because GTS symptoms can be temporarily debilitating, a financial incentive might exist for workers to smoke. Our ethnographic research[11] supports this idea, e.g., workers report smoking to reduce the risks of GTS.

Our sample of Mexican farmworkers is demographically very similar to another cross sectional study of Mexican farmworkers in eastern North Carolina.[12] In addition, selection of camps for the current study was random. These factors lead us to believe that the 38.5% prevalence of smoking which we found likely is representative of all male Mexican farmworkers in eastern North Carolina. However, the wide confidence intervals of most estimates reflect the relatively small sample size and adjustments for intra-camp correlations of smoking behavior.

Other reports have found a positive relationship between levels of acculturation and smoking prevalence among Mexican-American women nationally[9] and between education, acculturation, and smoking among Hispanic men.[13,14] Based on years in the U.S., English comprehension and language spoken at home, widely used measures of acculturation,[2] this report did not find such a relationship, possibly due to small sample size or to this study's definition of current smoking. Alternatively, although years working in the U.S. has a cumulative acculturation effect,[2] few of these farmworkers spoke or understood English well, and most of these farmworkers reported returning to Mexico for a period of a few weeks to 6 months each year. Thus, acculturation to the U.S. may not have been as great as in other studies.[9,13,14]

The prevalence of current smokeless tobacco use (1.1%) and cigar smoking (2.8%) among Mexican farmworkers has not been previously reported. Although low, these rates are consistent with those reported among Hispanic men nationally (1.5% and 2.1%, respectively).[15]

This study has a number of limitations. The first is the cross-sectional nature of these data, which precludes firm conclusions regarding causal relationships among variables. Second, these data are self-reported, which might not accurately reflect an individual's smoking status. However, saliva was collected for cotinine analyses which confirm these results.[16] Third, the definition of current smoking (smoking at least one cigarette within the past 7

days) differs from that of the National Health Interview Survey and other national surveys which define current smoking as having smoked 100 cigarettes in a lifetime and currently smoking.[2] Although this makes direct comparisons between these data and such national surveys more difficult, the Hispanic Health and Nutrition Examination Survey, using a similar case definition for current smoking (smoking at least 1 cigarette in the past 5 days) found a similar prevalence (44%) of current smoking among Hispanic men.[9] Finally, this is a small study among Mexican tobacco farmworkers working in North Carolina and may not accurately reflect the tobacco use habits of other Mexican farmworkers or of Mexican immigrants nationally.

Current smoking among this predominantly male sample of Mexican migrant farmworkers is common and is associated with alcohol use, a known correlate of tobacco use.[2] Knowledge of these epidemiologic patterns is important in agromedicine because agricultural workers are already exposed to numerous respiratory irritants.[6] Cigarette smoking among these workers further exacerbates the pulmonary effects of such irritants,[7] in addition to its other adverse health consequences. Research indicates that a variety of smoking intervention approaches are effective among a wide range of Hispanic populations.[17] Nonetheless, tobacco use interventions among farmworkers working in tobacco agriculture may additionally need to incorporate preventive strategies for GTS other than smoking. Our data may be useful in planning and implementing such tobacco cessation efforts in local migrant health centers that serve Mexican farmworkers as a means to improve workers' respiratory and overall health.

REFERENCES

1. Centers for Disease Control and Prevention. Smoking-attributable mortality and years of potential life lost–U.S., 1984; Editorial Note-1997 MMWR 46:444. [PubMed: 9182206]
2. United States Department of Health and Human Services. Tobacco Use Among United States Racial/Ethnic Minority Groups–African Americans, American Indians and Alaska Natives, Asian Americans and Pacific Islanders, and Hispanics: A Report of the Surgeon General. Atlanta, Georgia: United States Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1998.
3. Mines R, Gabbard S, Steirman A. 1997 Office of the Assistant Secretary for Policy, prepared for the Commission on Immigration Reform A profile of U.S. farm workers: demographic, household composition, income and use of services; based on data from the National Agricultural Workers Survey (NAWS). Washington, DC: Department of Labor.
4. Arcury TA, Quandt SA, Preisser JS, Norton D. The incidence of green tobacco sickness among Latino farmworkers. J Occup Environ Med 2001; 43:601–609. [PubMed: 11464390]
5. Arcury TA, Quandt SA, Preisser JS. Predictors of incidence and prevalence of green tobacco sickness among Latino farmworkers in North Carolina, USA. J Epidemiol Community Health 2001; 55:818–824. [PubMed: 11604438]
6. Schenker M, Ferguson T, Gamsky T. Respiratory risks associated with agriculture. Occupational Medicine: State of the Art Reviews 1991; 6:415–428.
7. Gamsky TE, Schenker MB, McCurdy SA and Samuels SJ. Smoking, respiratory symptoms and pulmonary function among a population of Hispanic farmworkers. Chest 1992; 101:1361–1368. [PubMed: 1582298]
8. Donner A, Donald A. The statistical analysis of multiple binary measurements. J Clin Epidemiol 1988; 41:899–905. [PubMed: 3183697]

9. Haynes SG, Harvey C, Montes H, Nickens H, Cohen BH VIII Patterns of cigarette smoking among Hispanics in the United States: Results from HHANES, 1982–1984. Am J Public Health 1990; 80 (Suppl):47–54.
10. Carabalo RS, Giovino GA, Pechacek TF, Mowery PD, Ritcher PA, et al. Racial and ethnic differences in serum cotinine levels of cigarettes smokers: Third National Health and Nutrition Examination Survey 1988–1991. JAMA 1998; 280:135–139. [PubMed: 9669785]
11. Rao P, Quandt SA, Arcury TA. Hispanic farmworker interpretations of green tobacco sickness. J Rural Health 2002; 18:503–511. [PubMed: 12380893]
12. Arcury TA, Quandt SA, Cravey AJ, Elmore RC, Russell GB. Farmworkers reports of pesticide safety and sanitation in the work environment. Am J Indust Med 2001; 39:497–498.
13. Navarro AM. Cigarette smoking among adult Latinos: the California Tobacco Baseline Survey. Ann Behav Med 1996; 18:238–245. [PubMed: 18425669]
14. Winkleby MA, Schooler C, Kraemer HC, Lin J, Fortman SP. Hispanic versus white smoking patterns by sex and level of education. Am J Epidemiol 1995; 142: 410–418. [PubMed: 7625406]
15. Centers for Disease Control and Prevention. Surveillance for selected tobacco use behaviors–United States, 1900–1994. MMWR 1994; 43(SS-3):1–43.
16. Quandt SA, Arcury TA, Preisser JS, Bernert JT, Norton D. Behavioral and environmental predictors of salivary cotinine in Latino tobacco workers. J Occup Environ Med 2001; 40(10):844–852.
17. Fiore MC, Bailey WC, et al. Clinical Practice Guideline: Treating Tobacco Use and Dependence. Bethesda, MD: US Department of Health and Human Services, Public Health Service; 2000:96.

TABLE 1.

Characteristics of migrant farm workers who work in tobacco by smoking status–Eastern North Carolina, 1999.

Characteristics	Total (n = 181) Percent (95% CI)	Smokers (n = 69) Percent (95% CI[2])	P value[1]
Age (Years)			
≤ 26	34.8 (12.5–51.7)	30.4 (0–64.8)	ns
27–33	30.4 (5.8–55.0)	34.8 (0.3–69.1)	
≥ 34	34.8 (11.5–58.1)	34.8 (8.7–60.9)	
Education (Grade)			
< 6	31.9 (7.2–56.6)	43.5 (12.0–75.0)	ns
6	30.2 (7.9–52.5)	27.5 (0–57.0)	
> 6	37.9 (14.7–61.6)	29.0 (0–60.5)	
Marital Status			
Married	75.3 (54.6–96.0)	81.2 (58.5–100)	ns
Sep./Div./Never Married	24.7 (3.2–46.2)	28.8 (0–63.2)	
English Comprehension			
None	48.9 (33.9–63.9)	56.5 (34.1–78.9)	ns
Very Little	37.9 (24.0–51.8)	30.4 (3.5–57.3)	
Some/Most/All	13.2 (0–28.2)	13.1 (0–38.9)	
Health Status			
Poor/Fair	12.1 (0–29.5)	18.8 (0–46.7)	0.09
Good	40.6 (15.8–65.1)	39.1 (6.8–71.4)	
Very Good/Excellent	47.3 (22.6–72.0)	42.1 (9.8–74.4)	
Years Working in U.S.			
≤ 1 Year	33.7 (11.7–55.7)	34.8 (3.8–65.8)	ns
2–5 Years	30.1 (5.3–54.9)	29.0 (0–63.1)	
≥ 6 Years	35.9 (12.4–59.4)	36.2 (7.6–64.8)	
Previously Worked in Tobacco?			
Yes	67.6 (45.6–89.6)	59.4 (29.3–89.5)	ns
No	32.4 (9.6–55.2)	40.6 (8.7–72.5)	
Speaks Spanish at Home			
No	7.7 (0–23.6)	5.8 (0–27.1) ns	ns
Yes	92.3 (79.5–100)	94.2 (80.3–100)	
Drinks in Past 7 Days			
None	76.8 (59.4–94.2)	58.0 (36.0–80.0)	0.002
One	16.6 (0–44.7)	30.4 (0–66.2)	
2 or more	6.6 (0–24.9)	11.6 (0–41.1)	

[1] P values calculated using Mantel-Haenszel chi-square test treating work sites as strata

[2] 95% CI = 95% confidence interval, calculated to account for intra-camp cluster sampling[8]