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Occupational Eye Injuries Experienced by Migrant Farmworkers

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Abstract

Migrant farmworkers in North Carolina (n=300) reported eye injuries, circumstances of injuries, and outcomes during lifetime US agriculture work. Seventeen injuries were reported by 15 farmworkers; five resulted in lost work time. Most reported injuries were penetrating or open wounds, often caused by branches or other foreign objects. Injuries were seldom reported to employers; and treatment at clinics, when received, was often delayed. The incidence rate of lost work-time injuries of 23.8/10,000 worker years (95% confidence interval 7.5, 55.9), exceeds the 2009 national incidence rate (6.9/10,000). Migrant farmworkers constitute a vulnerable population; better occupational safety protections should be considered.

Keywords

Latino; agriculture; health disparities

Migrant farmworkers work in an industry where eye injuries have long been a subject of concern.[1] Farmworkers, who work primarily in the fields doing manual labor, risk eye injuries from a variety of hazards in the work environment. Exposures introduced by different agricultural systems include chemicals like pesticides, growth enhancers, and fertilizers; tools; and machinery. The physical environment introduces still more exposures hazardous to eye health including ultraviolet light, airborne soil and particulates, pollen, varying levels of humidity, and plant components.

Studies of eye problems among farmworkers have targeted self-reported eye symptoms and vision-related health and safety practices. Migrant farmworkers report high levels of eye symptoms; few wear eye protection or receive preventive health care and assessments.[2–6] Recent research has highlighted visual impairment, finding that, while only about three percent of migrant farmworkers have impaired visual acuity for distance in either eye, rates for impaired near visual acuity are about three times as high.[7]

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Limited data exist for eye injuries among migrant farmworkers. Such workers are included among others in the agricultural crop production industry,[8] which had an annual rate of 6.9 eye injuries with lost work time per 10,000 workers. Because farmworkers do primarily manual labor, work in the fields, and report not using proper eye protection, their rates may differ from those of the industry as a whole.

In addition to differences in injury rates, migrant farmworkers may have different injury reporting practices from others in the industry group. Migrant workers as a whole appear to underreport injuries, due to a combination of factors. Most experience economic pressure to work to support families in the US or in their country of origin.[9] Most lack knowledge of the workers' compensation system, or work in jobs where workers' compensation is not available. In half of the states, farmworkers do not have the same workers' compensation coverage as others; in many, particularly in the eastern US, coverage for farmworkers is optional.[10] In North Carolina, for example, employers with less than 10 full-time, nonseasonal farm laborers do not have to provide workers' compensation.[11] For farmworkers in particular, health care access is often limited because of the limited number and capacity of migrant clinics.[12] Such constraints on reporting may lead to under-estimation of farmworker eye injuries by relying only on Bureau of Labor Statistics data.

This paper reports analyses designed to explore the rates of eye injuries among migrant farmworkers. Using data on self-reported eye injuries from a sample of migrant farmworkers in eastern North Carolina, we (1) estimate the rate of injuries among migrant farmworkers, (2) detail the circumstances of such injuries and subsequent health care, and (3) evaluate whether these data indicate a need for a more rigorous investigation of eye injuries in this population.

Methods

Data come from a cross-sectional study of eye health and safety among migrant farmworkers conducted in eastern North Carolina from June through August, 2009. Workers were selected and recruited using a sampling strategy described previously.[13] Briefly, farmworkers residential sites ("camps") were chosen in three eastern North Carolina counties: Harnett, Johnston, and Sampson. Camp selection used a strategy developed because camps are widely distributed and not occupied every year.[14,15] With the collaboration of the North Carolina Farmworkers Project, which serves all camps in the region and maintains a camp list, a random list of camps was created. Camps were visited in order. In occupied camps, study personnel explained the study and asked to do a preliminary census. Farmworkers in each camp were recruited from the census list, with up to six recruited per camp. To be eligible, a worker had to be currently engaged in farmwork and at least 18 years of age. At recruitment, the study was explained to the workers and informed consent obtained. Workers received $10 and protective glasses for completing the interview.

Data relevant for this paper were collected using an interviewer-administered questionnaire. This questionnaire included questions on a variety of health topics and took about 30 minutes to complete. Interviewers participated in a one-day training, which included a review of camp and participation selection, recruitment procedures, and interview data collection procedures. The questionnaire was developed in English and translated into Spanish by a native Spanish speaker familiar with Mexican Spanish and farmworker vocabulary. Five farmworkers were recruited to pretest the questionnaire. Modifications to the questionnaire were made based on their feedback.

The interview included the question: "Have you EVER had an eye injury while working in agriculture in the US?" Those responding positively were asked the type and cause of injury,

the task being performed during injury, whether and to whom the injury was reported, the site and timing of medical care received, and amount of work time lost. Additional questions obtained self-reported personal data, including age, education, and number of years worked in agriculture in the US. All workers chose to be interviewed in Spanish.

To calculate the rate of eye injuries for the sample, the number of eye injuries reported that resulted in one or more days of lost work time was divided by the number of worker years at risk of injury. The variable worker years at risk was calculated by summing the self-reported years working in US agriculture for all 300 workers. Confidence interval for the rate was calculated[16] assuming a simple random sample.

All participants gave signed, informed consent. All consent and data collection procedures were approved by the Wake Forest Health Sciences Institutional Review Board.

Results

Farmworkers at 62 camps were asked to participate in the study. At eight camps, workers declined to participate; and growers refused to allow study personnel to recruit at two camps. At the 52 camps included in the sample, 157 individuals refused to participate, for a participation rate of 66% (300/457). The overall sample size included 300 farmworkers recruited from 52 campsites.

The overall sample was 95% male (Table 1). Age ranged from 18 to 65 years, with a median of 34 years. Formal education ranged from none to 16 years; the median was 6 years. A fifth reported speaking an indigenous language. Almost two-thirds of the total sample was composed of workers on H-2A visas. The workers had worked from 1 to 40 seasons in US agriculture. The median reported was 6 seasons. Almost three-quarters had never had an eye examination. Based on reported years worked in agriculture for all 300 individual workers, the sample had a total of 2,104 years worked in US agriculture.

By comparison, the subsample of 15 who reported any eye injury during US farmwork was somewhat older, had a smaller proportion on H-2A visas, and, as would be expected, had more workers reporting having ever had an eye examination.

Seventeen work-related eye injuries were reported by 15 workers (Table 2). None of the workers were in the same camp. The most common injuries were penetrating or open wounds to the eyeball (n=13), followed by chemical gas or fumes (n=3) or a foreign body in the eye (n=1). Branches (9), pesticides (3), machinery (2), and stone (1) were reported as causes. The injuries occurred during all phases of agricultural production, from planting to post-harvest packing. Seven of seventeen injuries were reported to employers. The other ten injuries were not reported. There was a trend toward more injuries being reported if the worker was on an H-2A visa than if he was not (5 of 7 injuries vs. 3 of 10). For 5 injuries, the worker obtained care at a clinic. Care at home was reported for 4 injuries, and no care at all for 8 injuries. For those injuries that were treated at a clinic, care received varied from less than 1 hour to more than 1 week after the injury.

Five injuries resulted in lost work time, ranging from 1 to more than 14 days. Only 3 of these injuries were reported to employers. All were treated at clinics, but not until at least 4 days after the injury. The rate of lost work time injuries was 5 injuries/2,104 worker years, or 23.8/10,000 worker years (95% confidence interval 7.5, 55.9).

Discussion

Agriculture is a dangerous industry, and eye injuries have long been a focus of concern. Previous research with farmers showed that grinding and cutting metal caused most eye injuries.[1,17] In contrast, our data indicate plant branches and pesticides are the most common sources of eye injuries for farmworkers. This likely reflects the differences in tasks growers and farmworkers routinely perform. Farmworkers tend to work in fields or orchards hand cultivating and harvesting, while growers are more likely to engage in the higher skilled and more mechanized work on farms.

The incidence rate of 23.8/10,000 worker years for migrant farmworkers is significantly higher than the 6.9/10,000 workers reported in 2009 for the agricultural crop production industry as a whole.[8] Two factors may account for this difference. First, the proportion of farmworkers in the industry is unknown and so high rates among farmworkers may be diluted in national data by inclusion of other employees with lower rates of injuries. Second, workers fail to report injuries, so the data compiled by the Occupational Safety and Health Administration (OSHA) and reported by the BLS may underestimate eye injuries. The findings of the present study support this, as only three of five eye injuries resulting in missing work time were reported to a grower or supervisor. As suggested by a 2009 report by the Government Accountability Office,[18] underreporting can originate from employers' failure to record and report injuries for fear of increasing workers' compensation insurance, and from employees' failure to report the injuries to the employer. The latter often stems from a fear of being disciplined, losing wages, and even being fired. In the present study, workers with H-2A visas appeared to be somewhat more likely to report injuries. Because all have legal documentation to be in the US and, in North Carolina, they are the only workers with a union contract, fears of reprisal for reporting injuries may be less than for workers not on H-2A visas.

The high rate and sources of injuries underscore the importance of measures to increase eye protection use among farmworkers. Previous research has shown that workers only rarely wear eye protection. Reasons for lack of use range from eye protection interfering with work (making it hard to distinguish ripe leaves or fruit), comfort (slipping, fogging), cosmetic (being laughed at), economic (not having protective lenses), and misconception that risk of eye injuries is low.[3,4,13]

Employers are required to provide eye protection to employees and employees are required to wear such protection whenever workers are performing tasks that have a likelihood of injury. However, such regulations (OSHA 1910.133(a)) are not enforced. Less than 8% of workers in this sample (reported elsewhere[13]) had employer-provided eye protection. Interventions to increase appropriate use of eye protection have shown success in changing knowledge and behavior.[6,19] Despite their success, they have not been implemented on a large scale.

These data have limitations. Data are self-reported and cover lifetime experience of injuries, so injuries may be under-reported. However, lost work time injuries are likely salient enough to be recalled. Years worked in US agriculture may be misreported. However, examination of the distribution of these data showed no "heaping" of data by decades that would suggest rounding or estimating. These data are compared to national data for annual injuries. These are different measures, so assumptions are made in the comparison that may not be warranted. These data were collected in North Carolina where there are a significant number of workers with H-2A visas. Thus, these workers may not represent all migrant farmworkers in the US. However, this study has a high participation rate, with 84% of camps selected actually participating and 66% of workers within these camps consenting to

the study. This compares with the National Agricultural Workers Study, in which only 37% of growers selected were actually contacted and agreed to participate and then 76% of workers consented.[20]

The incidence of eye injuries reported by migrant farmworkers in this study exceeds OSHA statistics for all crop workers, indicating a health disparity. Migrant farmworkers lack many of the legal protections afforded non-agricultural workers.[10] They are also at risk of exploitation due to language barriers, lack of formal education, and issues of ethnicity and documentation status, making failure to report injuries and delays in receiving treatment troubling. Greater efforts to prevent eye injuries are needed, including dissemination of existing prevention programs.[6,19] A more detailed study of eye injuries and access to health care in this population is warranted, including the types of crops in which injuries occur, exactly how injuries happen, and whether greater access to care is available to workers covered by labor agreements or in different states.

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Table 1

Demographic characteristics of total sample and workers reporting eye injuries, North Carolina.

	Total Sample		Workers with Eye Injuries	
	N=300		N=15	
	N	%	N	%
Gender				
Male	285	95.0	15	100.0
Female	15	5.0	0	0.0
Age				
18–29 years	94	31.3	4	26.7
30–39 years	110	36.7	7	46.7
40+ years	96	32.0	4	26.7
Educational Attainment				
0–6 years	161	53.7	9	60.0
7–9 years	115	38.3	4	26.7
10+ years	24	8.0	2	13.3
Language Spoken [a]				
English	35	11.7	4	26.7
Spanish	299	99.7	15	100.0
Indigenous Language	60	20.0	3	20.0
H2A visa				
Yes	194	64.7	8	53.3
No	106	35.3	7	46.7
Seasons in US agriculture				
<1 year to 4 years	126	42.0	6	40.0
5 to 9 years	97	32.3	2	13.3
10+ years	77	25.7	7	46.7
Last time eyes checked				
Never	219	73.0	8	53.3
5 or more years ago	24	8.0	2	13.3
1 to 4 years ago	27	9.0	2	13.3
Less than a year ago	30	10.0	3	20.0

[a] Totals more than 300 because some farmworkers speak more than one language.

Table 2

Eye Injuries Experienced While Working in Agriculture in the US, as Reported by Migrant Farmworkers, North Carolina.

Worker	Age, yrs	Education, yrs	Years in US agriculture	H-2A visa	Work days missed	Injury type & cause	Task when injured	Injury reported to	Injury care received	
									Site	Time elapsed
1	25	6	1	No	>14	Penetrating wound, branches	Harvesting	Not reported	Home	--
2	44	3	19	No	3–7	Penetrating wound, branches	Topping tobacco	Not reported	Home	--
3	18	6	4	No	3–7	Pesticide in eye	Harvesting	Contractor or supervisor	Clinic	4–7 days
4	53	6	11	Yes	2	Penetrating wound, stone	Planting	Grower	Clinic	> 7 days
5	53	6	11	Yes	1	Penetrating wound, tractor	Loading, packing	Grower	Clinic	> 7 days
6	35	9	6	Yes	0	Penetrating wound, tractor	Loading, packing	Contractor or supervisor	Clinic	≤ 1 day
7	22	9	5	No	0	Open wound, branches	Harvesting	Contractor or supervisor	Home	2–3 days
8	33	12	3	Yes	0	Penetrating wound, branches	Harvesting	Not reported	None	--
9	36	6	13	No	0	Penetrating wound, branches	Planting	Not reported	None	--
10	55	9	10	Yes	0	Penetrating wound, branches	Loading, packing	Contractor or supervisor	Clinic	≤ 1 hour
11	19	5	1	Yes	0	Pesticide gas in eye	Installing plastic for fumigation	Not reported	None	--
12	30	9	10	Yes	0	Penetrating wound, branches	Harvesting	Not reported	None	--
13	36	6	1	No	0	Penetrating wound, branches	Harvesting	Not reported	None	--
14	38	10	13	Yes	0	Penetrating wound, branches	Barning, bailing tobacco	Grower	Home	--
15	32	3	3	No	0	Foreign body in eye, unknown	Unknown	Not reported	None	--
15	32	3	3	No	0	Pesticide gas in eye	Spraying pesticides	Not reported	None	--
15	32	3	3	No	0	Open wound, unknown	Unknown	Not reported	None	--