

Contact dermatitis in tobacco farmworkers

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Occupational skin disease is highly prevalent among agricultural workers. Tobacco cultivation and harvest are particularly hazardous for farmworkers. We report 5 migrant Latino farmworkers in North Carolina with contact dermatitis related to tobacco work. These cases show a characteristic distribution of contact dermatitis; the flexural and medial surfaces of the upper extremities were affected in each case, whereas most cases showed some involvement of the torso and axilla. This pattern most likely reflects a common occupational practice of holding the tobacco leaves under the arm and pressed against the body during harvesting.

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Occupational skin disease is widely recognized, but infrequently reported, among agricultural farmworkers (1). The nature of agricultural work results in exposure to chemical, biologic, and physical hazards on a daily basis. The agricultural industry has the highest incidence of skin diseases among all industrial sectors, with a reported U.S. annual incidence in 2003 of 18.5 per 10 000 workers in the crop production sector compared with 4.9 per 10 000 workers for all private industry (2). Multiple risk factors contribute to this high incidence, including wet working conditions, working in hot-humid climates, prior skin damage, and exposure to specific chemicals and plants in the work environment (1, 3).

Despite the multiple risk factors and high incidence of disease, research examining the prevalence and possible aetiologies of occupational skin disease in farmworkers is limited (1). Several studies have reported on occupational skin disease found in migrant and seasonal farmworkers, and among farmers (4–7). In a recent study of Latino farmworkers in North Carolina, 42 of the 54 men (77.7%) and 5 of the 5 women examined had a diagnosed skin disease. Contact dermatitis was diagnosed in 5.6% of the sample (5).

Tobacco farming is particularly hazardous to farmworkers because it is a chemical-intensive process. A successful crop requires multiple applications of insecticides, herbicides, ripening agents,

and growth regulators (8). Farmworkers are directly involved with these substances. They work in fields sprayed with pesticides and ripening agents, apply growth regulators, and harvest tobacco by hand that has been treated with these chemicals.

In 2 published reports of contact dermatitis found in tobacco harvesters, the farmworkers presented had positive patch tests to tobacco leaves (4, 9). In the case report of 2 Japanese harvesters, the workers presented with itchy, erythematous eruptions 1 day after working in tobacco fields (9). The areas of involvement included the face, neck, shoulders, and arms, all of which were exposed during harvesting. The 2 harvesters had been working in tobacco fields for a long time with no previous eruptions related to tobacco farming. Both Japanese harvesters had positive patch tests to raw tobacco leaf after 48 hr. In that report, researchers speculated that the dermatitis was related to ‘mechanical irritations of the tobacco leaf’. In a second case report, a female tobacco harvester with no history of eczema presented with pruritic, eczematous lesions on areas of skin exposed during harvesting (4). The lesions recurred every tobacco season. The farmworker had positive patch tests to green and yellowish tobacco leaves and to cured tobacco after 48 hr. The authors speculated that the allergen remained unchanged during the drying and curing process. The farmworker also had positive patch tests to

pyrethrum, pesticides containing pyrethrum that are used at the plantation, and several plant-derived substances (4).

In this case series, we report 5 migrant Latino farmworkers with contact dermatitis related to tobacco farming. These cases demonstrate a characteristic distribution of contact dermatitis.

Case Reports

The farmworkers in this case series include 5 migrant Latino male farmworkers from Mexico who presented to community and migrant health care clinics in North Carolina. They agreed to participate in a larger study of occupational skin disease and environmental risk factors in Latino farmworkers in North Carolina (5), which was approved by the Wake Forest University School of Medicine Institutional Review Board. Data on farmworkers presenting with skin disease were collected by clinic staff through a standard questionnaire and photographs. The questionnaire asked about work tasks performed in the past 7 days. The photographs were sent electronically to dermatologists at Wake Forest University School of Medicine for diagnostic evaluation. The dermatologists did not have any direct contact with the patients.

All 5 presented with itchy eruptions of exposed flexor surfaces (Table 1; Figs 1 and 2). All had worked in wet conditions. Only 1 of the 5 had a

history of asthma or hay fever. The eruptions involved flexor surfaces of the upper extremities and contiguous torso, with a tendency towards greater involvement of 1 side.

Discussion

The tobacco farmworkers in this case series share a characteristic pattern of distribution of contact dermatitis. In each case, the flexor and medial surfaces of the upper extremities were affected, with 1 side affected more severely than the other side. In addition, most cases had some involvement of the torso and axilla on the more severely affected side. This pattern of distribution most likely reflects a common occupational activity of holding the tobacco leaves under the arm and pressed against the body during harvesting (Fig. 3). The arm may be more affected than the torso because of limited protection provided by the short sleeve or sleeveless shirt that is typically worn.

Several plausible allergens and irritants may be causing the dermatitis. The contact dermatitis may be a direct result of contact with the tobacco plant. The tobacco plant has been listed as a potential irritant for contact dermatitis (10). Green (raw) tobacco is not, however, well established in the literature as a causative agent in contact dermatitis. Most reports of tobacco dermatitis stem from the late stages of tobacco production:

Table 1. Description of patients

Patient number and date	Age (years)	History of atopy	Previous treatment	Duration of rash	Symptoms	Distribution of rash	Exposure to tobacco in previous week	Reported pesticide exposure	Effect on work
1; 13 July 2006	50	No	None	2 days	Pruritus	Flexural and medial surfaces of his arms with predominance in the right antecubital fossa	Topping and harvesting	No	Eruption prevented work
2; 19 July 2006	35	No	Over-the-counter antifungal	3 weeks	Pruritus	Flexural and medial surfaces of his right arm, axilla, and torso	Topping	Yes	Bothered but did not stop work
3; 9 August 2006	46	No	Unspecified cream from local Mexican store	3 weeks	Pruritus	Right flexural and medial surfaces of his right arm, and axilla (Fig. 1)	Barning and baling	Yes	No effect on work
4; 28 August 2006	52	No	Chlorine bleach	3 weeks	Pruritus	Flexural and medial surfaces of arms, right greater than left	Topping and harvesting	No	Prevented work
5; 7 September 2006	25	Yes	None	4 days	Pruritus	Medial and flexural surfaces of his left arm, side of his left torso, and axilla (Fig. 2)	Harvesting and barning	Yes	Prevented work

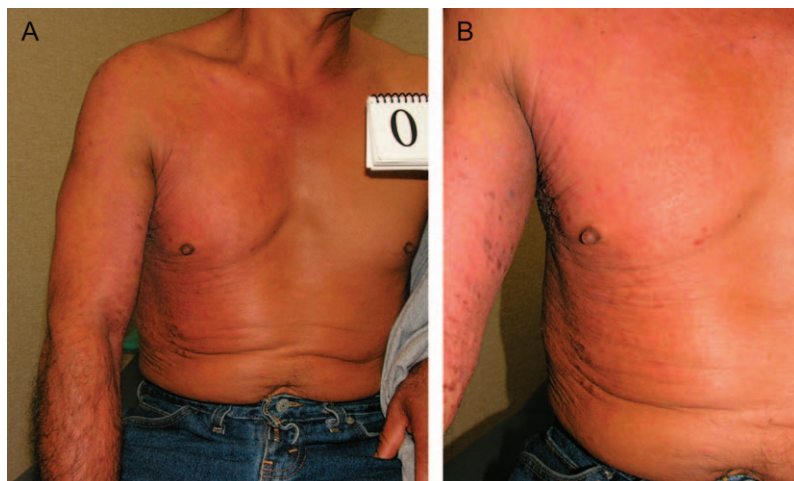


Fig. 1. Unilateral distribution of contact dermatitis on the flexural and medial surfaces of the arm, axilla, and torso.

leaf curing, handling cured leaves, and manufacturing cigars and cigarettes (11).

Alternatively, 1 of the agents applied to the tobacco may be the primary cause of the contact dermatitis. Schuman and Dobson (12) report an outbreak of contact dermatitis from pesticide exposure among farmworkers harvesting tomatoes. Many agents are applied to tobacco during a single agricultural season, varying in their toxicities and time of application. The patients in the present case reports presented from July through early September; therefore, the applications most likely affecting this patient population include agents applied from late June through August and include growth regulators and ripening agents. Maleic hydrazide and ethephon are 2 such agents commonly used in the region where farmworkers in this study work. Maleic hydrazide is a common growth regulator sprayed on tobacco

during July. It is applied to control the growth of secondary shoots known as ‘suckers’, which divert energy away from the tobacco leaves. It is slightly toxic to the skin with an Environmental Protection Agency (EPA) signal word of ‘caution’, which indicates minimal toxicity (13). Ripening agents, such as ethephon, are commonly applied to tobacco during the month of August. Ethephon is moderately toxic to the skin with an EPA signal word of ‘danger’, indicating that this application is among the most highly toxic agents (13).

Patch testing to evaluate the aetiology of these tobacco workers’ dermatitis was not performed. The potential causative allergens – the tobacco plant itself, pesticides, growth regulators, or even self-applied skin care products – would have been, in an ideal world, subjected to patch testing in these patients. Without such testing, an irritant or allergic contact dermatitis cannot be discriminated. Unfortunately, patch testing is impractical in the migrant farmworker population. These workers have difficulty accessing any formal medical care (14). Barriers include communication, cost, transportation, and cultural beliefs



Fig. 2. Unilateral distribution of contact dermatitis with predominance over the side of the torso and axilla.



Fig. 3. Farmworker harvesting tobacco.

(14). The multiple visits required for patch testing are a major barrier to these individuals whose livelihoods are tied to their work. The dermatological evaluation these patients received was achieved through telemedicine consultation. Accessing specialized patch testing services is generally not within these patients' means.

Tobacco farming exposes agricultural workers to a wide range of potential irritants. Although the chemical cause of contact dermatitis cannot be deduced from this case series, one can conclude with a reasonable degree of certainty that environmental exposure common to tobacco farming is a causal factor in contact dermatitis. These cases share a characteristic pattern of distribution developing from the way tobacco leaves are commonly held during harvesting. Timing relative to the tobacco season suggests growth regulators or ripening agents as potentially relevant environmental exposures.

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