

- 7 Rappersberger K, Konrad K, Wieser E, *et al.* Morphological changes in peripheral blood cells and skin in amiodarone-treated patients. *Br J Dermatol* 1986; 114: 189–196.
- 8 Zachary CB, Slater DN, Holt DW, *et al.* The pathogenesis of amiodarone-induced pigmentation and photosensitivity. *Br J Dermatol* 1984; 110: 451–456.
- 9 Hall MA, Annas A, Nyman K, *et al.* Basalioma after amiodarone therapy—not only in Britain. *Br J Dermatol* 2004; 151: 932–933; Author reply 933.
- 10 Monk B. Amiodarone-induced photosensitivity and basal-cell carcinoma. *Clin Exp Dermatol* 1990; 15: 319–320.

Tattooing practices in the migrant Latino farmworker population: risk for blood-borne disease

Tattoos raise several medical concerns, including the potential for spreading blood-borne infection. Infection control measures typically used by professional tattooists include changing gloves between clients, hand and skin cleansing, and sterilization or single-use equipment (e.g. needles, tattoo guns, and ink supplies),¹ however, such behavior is highly operator-dependent. The lack of aseptic technique in amateur tattoos results in greater risk of exposure to blood-borne diseases, including hepatitis B, hepatitis C, HIV, syphilis, and others.^{1–6} While the prevalence of amateur tattoos is unknown, the number of virulent community-acquired pathogen outbreaks (e.g. methicillin-resistant staphylococcus infection) associated with amateur or unlicensed tattooists or to poor adherence to aseptic tattooing techniques is increasing.¹

Migrant Latino farmworkers are one group of particular concern for the spread of blood-borne infection. Farmworkers live away from their home communities and families in crowded conditions that are conducive to the spread of infectious disease.⁷ Traditional beliefs about self-medication involving reuse and sharing of injection needles adds to the potential risks of spreading contagion in this population.^{8,9} We conducted an observational analysis of migrant Latino farmworkers to assess the prevalence and type (i.e. amateur) of tattooing in this immigrant population.

During the 2005 agricultural season, 304 farmworkers residing in 45 camps in nine North Carolina counties were interviewed. A standard set of 10 digital images was made of each farmworker and reviewed by a single research assistant to assess the frequency and type of tattoos in this population. Amateur tattoos were defined by the presence of a single blue-black color and broad lines with indistinct borders (Fig. 1). Professional tattoos were identified by their use of multiple colors, fine lines and details, and sharp, distinct borders.¹⁰

In our study, participant age ranged from 18 to 45 years. Years of education varied from 1 to 12. Participants originated from many Mexican states (Fig. 2). Tattoos were identified in 19 (6%) of the participants. Three workers (1%) had only professional tattoos, 13 others had only amateur tattoos (4.3%, Fig. 1), and three workers (1%) had both types. Farmworkers with tattoos had no distinguishing personal characteristics (Table 1).



Figure 1 Amateur tattoo. Amateur tattoos are generally simple in appearance, without complex colors or design features. The lines within amateur tattoos tend to be thicker and less distinct than lines in professional tattoos

We found that 1 in 15 migrant Latino farmworkers has a tattoo. More importantly, over 1 in 20 migrant farmworkers has an amateur tattoo, representing 84% of those with tattoos. Tattooing, especially when performed by unlicensed artists, risks spread of blood-borne infectious disease.¹ This transmission risk is complicated by the cultural practice common in Latino farmworkers of lay person medicinal injections. The associated needle sticks may result in transmission of blood-borne illnesses (i.e. HIV and hepatitis B) at relatively high rates among Latino farmworkers.^{8,9} In a study of needle sharing, many migrant farmworkers were initially found to have limited knowledge of the infectious risks related to needle sharing. However this behavior was found to be modified or completely abandoned after proper education.⁹

The common practices of amateur tattooing and other forms of lay injections in the migrant farmworker population, especially with the additional risk of needle sharing, represent

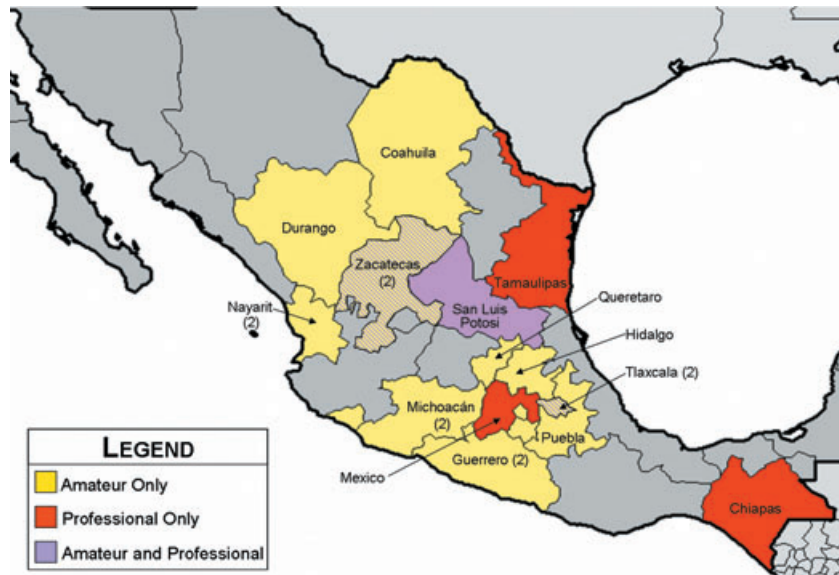


Figure 2 Map of Mexican States with the relative distribution of tattooed farmworkers. (Note: Zacatecas and Tlaxcala have two different classifications of tattooing)

Table 1 Personal characteristics of migrant Latino farmworkers with tattoos

Type of tattoo	Age	Years of education	State in Mexico*	Indigenous language	H2A visa
Professional	19	9	Mexico	No	No
Tattoo Only	21	3	Chiapas	No	No
	21	4	Tamaulipas	No	Yes
Amateur	45	6	Nayarit	No	Yes
Tattoo Only	31	1	Durango	No	Yes
	34	6	Coahuila	No	Yes
	18	9	Puebla	No	No
	27	10	Hidalgo	No	Yes
	27	6	Michoacán	Purepecha	Yes
	27	6	Zacatecas	No	Yes
	19	6	Queretaro	No	No
	41	3	Tlaxcala	No	Yes
	30	1	Michoacán	Purepecha	Yes
	24	12	Guerrero	No	No
	37	3	Guerrero	No	No
	38	6	Nayarit	No	Yes
Professional and Amateur Tattoos	29	9	Tlaxcala	No	Yes
	23	10	San Luis Potosí	No	No
	24	9	Zacatecas	No	No

*A map of Mexican States can be found at URL: http://www.statemuseum.arizona.edu/edu/resources/santos_diablos/_images/map_mexico.gif, accessed August 19, 2007.

a public health concern. This risk behavior can be reduced by education and is therefore a good target for mitigating transmission risks. Clinicians treating migrant farmworkers, health educators and health outreach workers can educate farmworkers about the dangers of this practice, with emphasis placed on the potential for the unintentional infections of

others, including spouses who remain in the community of origin. Farmworkers with amateur tattoos should be screened for infectious diseases.

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References

- Centers for Disease Control and Prevention. Methicillin-resistant *Staphylococcus aureus* skin infections among tattoo recipients – Ohio, Kentucky, and Vermont, 2004–05. *MMWR* 2006; **55**: 677–679.

- 2 Jacob CI. Tattoo-associated dermatoses: a case report and review of the literature. *Dermatol Surg* 2002; 28: 962-965.
- 3 Ko YC, Ho MS, Chiang TA, *et al*. Tattooing as a risk of hepatitis C virus infection. *J Med Virol* 1992; 38: 288-291.
- 4 Long GE, Rickman LS. Infectious complications of tattoos. *Clin Infect Dis* 1994; 18: 610-619.
- 5 Montgomery DF, Parks D. Tattoos: counseling the adolescent. *J Pediatr Health Care* 2001; 15: 14-19.
- 6 Nishioka SA, Gyorkos TW. Tattoos as risk factors for transfusion-transmitted diseases. *Int J Infect Dis* 2001; 5: 27-34.
- 7 Arcury TA, Quandt SA. Delivery of health services to migrant and seasonal farmworkers. *Annu Rev Public Health* 2007; 28: 345-363.
- 8 Flaskerud JH, Nyamathi AM. Home medication injection among Latina women in Los Angeles: implications for health education and prevention. *AIDS Care* 1996; 8: 95-102.
- 9 McVea KL. Lay injection practices among migrant farmworkers in the age of AIDS: evolution of a biomedical folk practice. *Soc Sci Med* 1997; 45: 91-98.
- 10 Sweeney SM. Tattoos: a review of tattoo practices and potential treatment options for removal. *Curr Opin Pediatr* 2006; 18: 391-395.

Eosinophilic cellulitis caused by adenocarcinoma of the lung

The pathogenesis of Wells' syndrome (eosinophilic cellulitis) is unknown, but it is considered to be a hypersensitivity reaction to a variety of triggers, such as insect bites, parasitic and viral infections, medications, and lymphoproliferative disorders. Only a small number of nonhematologic malignancies, including bronchogenic and anal squamous cell carcinoma (SCC), nasopharyngeal carcinoma, and colonic adenocarcinoma, have been noted in patients with Wells' syndrome.¹⁻⁴ The association of Wells' syndrome with adenocarcinoma of the lung has not been reported previously.

A 60-year-old man, a smoker of 40 packets of cigarettes per year with a chronic cough, was referred to the Dermatology Department with a 2-year history of widespread pruritic urticarial lesions involving the trunk and extremities (Fig. 1). Skin biopsy showed eosinophils and numerous "flame" figures (granular eosinophilic deposits) surrounded by histiocytes, consistent with eosinophilic cellulitis (Fig. 2). There was no peripheral blood eosinophilia. Chest X-ray revealed a nodule in the right mid zone. A diagnosis of bronchoalveolar adenocarcinoma was made following right middle lobectomy. Four days postoperatively, the cutaneous eruption cleared spontaneously. The eruption recurred 3 months later, and cytologic examination of an aspirate from a newly enlarged retroauricular lymph node showed metastatic adenocarcinoma.

Wells' syndrome was first described in 1971 by George C. Wells as "recurrent granulomatous dermatitis with eosinophilia", and was termed "eosinophilic cellulitis" in 1979 by Wells and Smith.⁵ Wells suggested that the disorder was a hypersensitivity reaction to a precipitating event, such as an arthropod bite. The syndrome has a variable clinical presentation which can include annular plaques, urticaria, edema, vesicles, papules or nodules, or a cellulitis-like appearance. The clinical features may vary with the location of infiltrates within the dermis.⁵

Immunofluorescence staining of skin biopsy specimens reveals that the deposition of eosinophil granule major basic protein corresponds to the flame figures, and therefore



Figure 1 Urticarial eruption of the trunk. The eruption also involved the extremities

eosinophils may be involved in the pathogenesis of this syndrome. Early flame figures are associated with eosinophils; established lesions have few or no intact eosinophils, suggesting that eosinophil degranulation is part of the pathogenic process.⁶ Increased proportions of T cells and high levels of interleukin-5 (IL-5), found in some patients, suggest that activated T cells may induce eosinophilia and promote subsequent eosinophil homing to the skin.⁷