RESEARCH LETTERS

Atypical Mycobacteria Infection Following Tattooing: Review of an Outbreak in 8 Patients in a French Tattoo Parlor

Environmental (atypical) mycobacteria may be inoculated after surgery, acupuncture, mesotherapy, intravenous catheter use, or subcutaneous injections. Inoculation after tattooing has also been reported in a single case. Herein, we describe an outbreak of an undetermined atypical mycobacterial infection after tattooing that occurred in Grenoble, France, during the year 2005.

Report of Cases. Eight otherwise healthy patients (6 men and 2 women; median age, 24 years) were referred to our institution between January and May 2005 for multiple asymptomatic erythematous papules and pustules strictly confined to the gray parts of their tattoos (Table). Findings from examination were otherwise unremarkable. All of the tattoos had been performed in the same parlor by the same artist (Figure). Lesions evolved mostly within 10 to 21 days after the first tattoo session and between 2 and 5 months prior to presentation. Only patient 3 underwent 4 tattoo sessions (1 per month) with the same black ink without any complications before lesions occurred within 10 days after the fifth tattoo session.

Findings from direct examination, cultures from swabs, and analysis of biopsy specimens were negative for Staphylococcus species, Gram-negative organisms, and Mycobacteria. Acid-fast bacilli staining of a sample from the bottle of tattoo ink used for all the patients proved positive, but culture results were negative, and no organism could be identified.

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Histologic studies showed epidermal pseudopithelio-omatous hyperplasia with intracorneal pustules. In the lower skin layers, lymphocytes, plasmocytes, neutrophils, and epithelioid histiocytes infiltrated the dermis, sometimes with a giant cell granulomatous reaction. Exogenous dark pigments were observed within the inflammation, mostly in epithelioid histiocytes. Findings from periodic acid–Schiff and Ziehl-Neelsen staining were negative.

Local antibiotic therapy (fusidic acid) was ineffective in 4 cases. Suspicion of mycobacterial infection prompted us to initiate a 1-month regimen of oral minocycline hydrochloride, 100 mg, twice daily, for 6 patients. Among these 6 patients, 2 patients experienced minocycline-induced vertigo that prompted us to replace minocycline treatment with clarithromycin stearate therapy, 250 mg, twice daily, for 1 month. One patient was immedi-

Table. Main Characteristics of the 8 Study Patients

<table>
<thead>
<tr>
<th>Patient No./Sex/Age, y</th>
<th>No. of Sessions (Date)</th>
<th>Delay of Onset</th>
<th>Date of Presentation</th>
<th>Clinical Findings</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/M/25</td>
<td>Several (NA)</td>
<td>10 Days after last session in October 2004</td>
<td>January 7, 2005</td>
<td>Papules, pustules</td>
<td>Minocycline HCl, 200 mg/d, 1 mo</td>
<td>Improvement</td>
</tr>
<tr>
<td>2/F/22</td>
<td>1 (November 2004)</td>
<td>21 Days after session</td>
<td>January 10, 2005</td>
<td>Papules, pustules, ulcerated nodules</td>
<td>Minocycline HCl, 200 mg/d, 1 mo</td>
<td>Improvement</td>
</tr>
<tr>
<td>3/M/23</td>
<td>5 (June, July, August, September, and October 2004)</td>
<td>10 Days after fifth session in October 2004</td>
<td>January 12, 2005</td>
<td>Papules, pustules</td>
<td>Clarithromycin stearate, 500 mg/d, 1 mo</td>
<td>Improvement</td>
</tr>
<tr>
<td>4/M/21</td>
<td>1 (November 2004)</td>
<td>15 to 21 days after session</td>
<td>January 14, 2005</td>
<td>Papules, pustules</td>
<td>Minocycline HCl, 200 mg/d, 1 mo</td>
<td>Improvement</td>
</tr>
<tr>
<td>5/M/22</td>
<td>4 (October and November 2004, beginning and end of January 2005)</td>
<td>15 Days after first and second sessions; 5 days after third session; no reaction after fourth session</td>
<td>January 21, 2005</td>
<td>Papules, pustules</td>
<td>Minocycline HCl, 200 mg/d, 1 mo</td>
<td>Improvement</td>
</tr>
<tr>
<td>6/M/20</td>
<td>1 (January 2005)</td>
<td>15 Days after session</td>
<td>March 11, 2005</td>
<td>Papules, pustules</td>
<td>Minocycline HCl, 200 mg/d, 1 mo; switcheda to clarithromycin stearate, 500 mg/d, 1 mo</td>
<td>Improvement</td>
</tr>
<tr>
<td>7/M/26</td>
<td>1 (January 2005)</td>
<td>7 Days after session</td>
<td>April 18, 2005</td>
<td>Pustules</td>
<td>Bacitracin, neomycin sulfate, 2 mo</td>
<td>NA</td>
</tr>
<tr>
<td>8/F/31</td>
<td>1 (December 2004)</td>
<td>15 Days after session</td>
<td>May 16, 2005</td>
<td>Papules, pustules, painful under shower</td>
<td>Minocycline HCl, 200 mg/d, 1 mo; switcheda to clarithromycin stearate, 500 mg/d, 1 mo</td>
<td>Improvement</td>
</tr>
</tbody>
</table>

Abbreviations: HCl, hydrochloride; NA, not available.

a Switched after 1 month owing to drug’s ineffectiveness and adverse effect (vertigo).
b Switched after 1 month owing to drug’s adverse effect (vertigo).
parlor. In that case, within 7 to 10 days after tattooing, similar outbreak was reported in another French tattoo ment with clarithromycin or minocycline. In addition, a cilli in the ink; and (6) the favorable outcome under treat-

histologic findings of neutrophilic infiltration of the der-

sis may occur after tattooing because of lack of hygiene and reported that no relapse had occurred. Five patients were contacted by telephone in October 2007 and reported that no relapse had occurred.

Comment. Pyogenic infections, leprosy, and tuberculosis may occur after tattooing because of lack of hygiene during the procedure, use of dirty tools and/or contaminated pigments, and absence of follow-up care. Wolf and Wolf reported a case of erythematous nodules that arose in a 3-month-old tattoo. Acid-fast organisms were detected by Ziehl-Neelsen stain, and a common antigen to all Mycobacteria species was found by polymerase chain reaction. Another case involving draining sinuses, abscesses, and acid-fast bacilli found on histologic analysis was reported recently. 

Indications of environmental mycobacterial infection in the present cases include (1) the outbreak presentation; (2) the restriction of the lesions to a single color; (3) the clinical presentation with papules and pustules, formerly described with mycobacterial infection; (4) the histologic findings of neutrophilic infiltration of the dermis and granulomas; (5) identification of acid-fast bacilli in the ink; and (6) the favorable outcome under treatment with clarithromycin or minocycline. In addition, a similar outbreak was reported in another French tattoo parlor. In that case, within 7 to 10 days after tattooing, 20 men, aged 23 to 49 years, developed multiple itchy papules and pustules restricted to the gray parts of the tattoos. Acid-fast bacilli were observed, and Mycobacterium chelonae was identified by culture and polymerase chain reaction. Outcomes were favorable under treatment with clarithromycin and tobramycin.

An atypical mycobacteria might have been one of the causes of the outbreak in the present cases, although we failed to identify any. Inoculation might have been related to the use of tap water to dilute the black ink and obtain the gray color. A common “mix” was indeed used for all customers during the several months under consideration and left at ambient temperature, potentially allowing the growth of pathogenic mycobacteria. Patient 3 was infected only after the fifth session because the mix was used only at that time. Patient 5 developed lesions quickly (within 5 days) after the third session, indicating a higher concentration of bacteria in the old and used mix. The tattoo artist changed his practice by preparing a fresh mix just before tattooing, allowing patient 5 to undergo his fourth session without any reaction. No other case occurred in the previous 2 years.

This outbreak illustrates the importance of instituting laws and regulations to govern the education of tattoo artists and the practice of applying tattoos.

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Author Contributions: Dr Kluger had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Kluger. Acquisition of data: Kluger, Muller, and Gral. Analysis and interpretation of data: Kluger, Muller, and Gral. Drafting of the manuscript: Kluger. Critical revision of the manuscript for important intellectual content: Kluger, Muller, and Gral. Administrative, technical, and material support: Gral. Study supervision: Muller and Gral.

Financial Disclosure: None reported.


8. Ejersted A, Lundsgaard J. Outline for a possible regulation of the tattooing and piercing area through a certification and approval arrangement. In: Pa-

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