

According to study protocol, he will be followed for 1 year posttreatment to monitor for relapse.

The shortened treatment regimen has several potential benefits for children. The shorter treatment period enables an earlier return to school and social activities, the shorter duration of anti-TB injectable drug use may lessen ototoxicity, and fewer adverse effects and shorter duration could improve treatment adherence.

The reluctance to include children in TB research studies may result from difficulties in confirming a diagnosis (due to paucibacillary disease and difficulty in obtaining specimens); such confirmation is often a prerequisite for treatment. Other barriers include lack of second-line TB drug formulations and pharmacokinetic data for children, ethics review issues, and informed and parental consent issues. Clinicians and TB program managers could consider the 9-month treatment regimen for children. We advocate inclusion of children of all ages in research investigating the efficacy and safety of a 9-month regimen and emphasize the importance of separately reporting data for children.

Acknowledgment

We thank Sarah Venis for editing assistance.

References

1. World Health Organization. Global tuberculosis report 2014 [cited 2015 May 20]. http://www.who.int/tb/publications/global_report/en/
2. Jenkins HE, Tolman AW, Yuen CM, Parr JB, Keshavjee S, Perez-Velez CM, et al. Incidence of multidrug-resistant tuberculosis disease in children: systematic review and global estimates. *Lancet*. 2014;383:1572–9. [http://dx.doi.org/10.1016/S0140-6736\(14\)60195-1](http://dx.doi.org/10.1016/S0140-6736(14)60195-1)
3. World Health Organization. Guidelines for the programmatic management of drug-resistant tuberculosis. 2011 update [cited 2015 May 20]. http://www.who.int/tb/challenges/mdr/programmatic_guidelines_for_mdrtb/en/
4. Van Deun A, Maug AKJ, Salim MAH, Das PK, Sarker MR, Daru P, et al. Short, highly effective, and inexpensive standardized treatment of multidrug-resistant tuberculosis. *Am J Respir Crit Care Med*. 2010;182:684–92. <http://dx.doi.org/10.1164/rccm.201001-0077OC>
5. Aung KJM, Van Deun A, Declercq E, Sarker MR, Das PK, Hossain MA, et al. Successful “9-month Bangladesh regimen” for multidrug-resistant tuberculosis among over 500 consecutive patients. *Int J Tuberc Lung Dis*. 2014;18:1180–7. <http://dx.doi.org/10.5588/ijtld.14.0100>
6. Nunn AJ, Rusen ID, Van Deun A, Torrea G, Phillips PPJ, Chiang C-Y, et al. Evaluation of a standardized treatment regimen of anti-tuberculosis drugs for patients with multi-drug-resistant tuberculosis (STREAM): study protocol for a randomized controlled trial. *Trials*. 2014;15:353. <http://dx.doi.org/10.1186/1745-6215-15-353>
7. Trébuq A, Schwoebel V, Kuaban C, Kashongwe Munogolo Z, Fikouma V, Bakayoko A, et al. Expanded shortened MDR-TB treatment: the west African experience. In: Abstracts of the 45th Union World Conference on Lung Health; Barcelona, Spain; 2014 Oct 28–Nov 1. Symposia 10. Paris: The Union; 2014.
8. World Health Organization. The use of short regimens for treatment of multidrug resistant tuberculosis [cited 2015 May 20]. http://www.who.int/tb/challenges/mdr/short_regimen_use/en/
9. du Cros P, Khamraev AK, Mirzagalib T, Nargiza P, Zinaida T, Marjan S, et al. Effectiveness of a simplified short regimen for multidrug resistant tuberculosis treatment in Karakalpakstan, Uzbekistan [cited 2015 May 20]. <http://hdl.handle.net/10144/322296>
10. Ettehad D, Schaaf HS, Seddon JA, Cooke GS, Ford N. Treatment outcomes for children with multidrug-resistant tuberculosis: a systematic review and meta-analysis. *Lancet Infect Dis*. 2012;12:449–56. [http://dx.doi.org/10.1016/S1473-3099\(12\)70033-6](http://dx.doi.org/10.1016/S1473-3099(12)70033-6)

Address for correspondence: Jay Achar, Médecins Sans Frontières, 10 Furnival St, London EC4A 1AB, UK; email: jay.achar@london.msf.org

Human Infection with *Sporolactobacillus laevolacticus*, Marseille, France

Cédric Abat,¹ Jad Kerbaj,¹ Gregory Dubourg, Vincent Garcia, Jean-Marc Rolain

Author affiliation: Aix-Marseille Université, Marseille, France

DOI: <http://dx.doi.org/10.3201/eid2111.151197>

To the Editor: *Sporolactobacillus laevolacticus*, formerly known as *Bacillus laevolacticus*, is a gram-positive, acid-tolerant, catalase-positive, facultatively anaerobic and mesophilic bacteria initially isolated from the rhizosphere of wild plants (1,2). However, there have been no reports of its isolation from humans. We report *S. laevolacticus* associated with a wound infection and cellulitis in a patient hospitalized in Marseille, France.

In March 2015, a 47-year-old man with no underlying disease was admitted to the emergency unit of the North Hospital in Marseille, France. He had an infected wound on his right foot that occurred after he jogged barefoot during a vacation in Comoros, but the patient did not know how he obtained the wound and had not taken any antiinflammatory drugs. The foot became swollen, red, hot, and painful. He visited a doctor during his vacation and was prescribed antiinflammatory drugs and antimicrobial drugs, including a second-generation cephalosporin and ofloxacin.

The patient returned to Marseille, but the infection persisted. At admission, the patient was afebrile but had high levels of C-reactive protein (85.7 mg/L [reference range 1–3 mg/L]) and fibrinogen (8.35 g/L), which indicated inflammation. His leukocyte count was normal (9.29 × 10⁹ cells/L) but his procalcitonin level (0.19 µg/L) was increased, which suggested that the infection had not been

¹These authors contributed equally to this article.



Figure. A) Foot of a 47-year-old man showing wound infected with *Sporolactobacillus laevolaticus*, Marseille, France. B) Drainage of a cellulitis abscess. C) Extent to which the wound on the arch of the foot had healed 6 weeks after surgery and antimicrobial drug therapy. A color version of this figure is available online (<http://wwwnc.cdc.gov/EID/article/21/11/15-1197-F1.htm>).

cured. A cellulitis abscess was suspected, and surgical cleaning and drainage was performed on March 10 (Figure, panels A, B).

Samples were collected during surgery and probabilistic antimicrobial drug therapy, including tazocillin, clindamycin, and vancomycin, was initiated. Abscess puncture liquid collected during surgery was sterile when incubated directly on Columbia and Polyvitex agar plates (bioMérieux, Craponne, France). However, a surgical sample inoculated into a blood culture bottle grew gram-positive bacilli after 4 days.

Subculture colonies were identified by using matrix-assisted laser desorption/ionization time of flight (MALDI-TOF) mass spectrometry (Bruker, Leipzig, Germany) as *S. laevolaticus* (score 1.88). Identification was confirmed by PCR amplification of the 16S RNA gene (3). A 944-bp sequence showed 99.5% similarity with that of a known *S. laevolaticus* strain (GenBank accession no. AB362648) by BLAST analysis (<http://www.ncbi.nlm.nih.gov>).

The *S. laevolaticus* strain was susceptible to amoxicillin, amoxicillin/clavulanate, imipenem, metronidazole, clindamycin, and vancomycin. The antimicrobial drug regimen was then changed to clindamycin and trimethoprim/sulfamethoxazole, and the patient showed an excellent clinical outcome. The patient was considered clinically cured 7 weeks later (Figure, panel C).

S. laevolaticus has been studied for its capacity to survive extreme conditions and for its fermentation system (4–8). The fact that the bacterium has not been previously isolated from humans might be because it was isolated only from plant rhizospheres (2), so human studies have not been conducted. In addition, conventional identification methods, such as the VITEK 2 system (bioMérieux) or the API system (bioMérieux), cannot identify *S. laevolaticus*. Since September 2009, we have used MALDI-TOF mass spectrometry in North Hospital for routine identification

of bacterial species isolated from clinical samples (9). This strategy increases our capacity to detect rare bacterial species, including emerging pathogens (10).

The bacterial species was accurately identified by using MALDI-TOF and then confirmed by using a 16S RNA PCR. Because the bacterium was originally isolated from a plant rhizosphere and the patient was hospitalized with an open wound in the foot and bacteremia, we speculate that the infection was the direct result of close extended contact between the wound and soil infected with the bacteria. This case confirms that *S. laevolaticus* can be responsible for human infections and suggests that this bacterial species could be an emerging opportunistic pathogen responsible for human infections.

Acknowledgment

We thank TradOnline (<http://www.tradonline.fr/en/>) for providing English corrections.

This study was partly supported by the Centre National de la Recherche Scientifique and the Institut Hospitalo-Universitaire Méditerranée Infection.

References

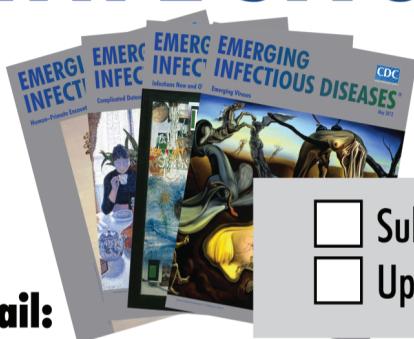
- Andersch I, Pianka S, Fritze D, Claus D. Description of *Bacillus laevolaticus* (ex Nakayama and Yanoshi 1967) sp. nov., nom. rev. *Int J Syst Bacteriol.* 1994;44:659–64. <http://dx.doi.org/10.1099/00207713-44-4-659>
- Nakayama O, Yanoshi M. Spore-bearing lactic acid bacteria isolated from rhizosphere I. Taxonomic studies on *Bacillus laevolaticus* nov. sp. and *Bacillus racemilacticus* nov. sp. *J Gen Appl Microbiol.* 1967;13:139–53. <http://dx.doi.org/10.2323/jgam.13.139>
- Morel A-S, Dubourg G, Prudent E, Edouard S, Gouriet F, Casalta J-P, et al. Complementarity between targeted real-time specific PCR and conventional broad-range 16S rDNA PCR in the syndrome-driven diagnosis of infectious diseases. *Eur J Clin Microbiol Infect Dis.* 2015;34:561–70. <http://dx.doi.org/10.1007/s10096-014-2263-z>

4. Mowlick S, Inoue T, Takehara T, Kaku N, Ueki K, Ueki A. Changes and recovery of soil bacterial communities influenced by biological soil disinfection as compared with chloropicrin- treatment. *AMB Express*. 2013;3:46. <http://dx.doi.org/10.1186/2191-0855-3-46>
5. Sawai H, Na K, Sasaki N, Mimitsuka T, Minegishi S, Henmi M, et al. Membrane-integrated fermentation system for improving the optical purity of D-lactic acid produced during continuous fermentation. *Bioresour Technol*. 2011;75:2326–32. <http://dx.doi.org/10.1271/bbb.110486>
6. Li Y, Wang L, Ju J, Yu B, Ma Y. Efficient production of polymer-grade D-lactate by *Sporolactobacillus laevolacticus* DSM442 with agricultural waste cottonseed as the sole nitrogen source. *Bioresour Technol*. 2013;142:186–91. <http://dx.doi.org/10.1016/j.biortech.2013.04.124>
7. Gulati HK, Chadha BS, Saini HS. Production and characterization of thermostable alkaline phytase from *Bacillus laevolacticus* isolated from rhizosphere soil. *J Ind Microbiol Biotechnol*. 2007;34:91–8. <http://dx.doi.org/10.1007/s10295-006-0171-7>
8. Wang H, Wang L, Ju J, Yu B, Ma Y. Genome sequence of *Sporolactobacillus laevolacticus* DSM442, an efficient polymer-grade D-lactate producer from agricultural waste cottonseed as a nitrogen source. *Genome Announc*. 2013;1:e01100–13.
9. Seng P, Drancourt M, Gouriet F, La Scola B, Fournier P-E, Rolain JM, et al. Ongoing revolution in bacteriology: routine identification of bacteria by matrix-assisted laser desorption ionization time-of-flight mass spectrometry. *Clin Infect Dis*. 2009; 49:543–51. <http://dx.doi.org/10.1086/600885>
10. Seng P, Abat C, Rolain JM, Colson P, Lagier J-C, Gouriet F, et al. Identification of rare pathogenic bacteria in a clinical microbiology laboratory: impact of matrix-assisted laser desorption ionization-time of flight mass spectrometry. *J Clin Microbiol*. 2013;51:2182–94. <http://dx.doi.org/10.1128/JCM.00492-13>

Address for correspondence: Jean-Marc Rolain, Unité de Recherche sur les Maladies Infectieuses Tropicales Emergentes, UM 63, Centre National de la Recherche Scientifique 7278, Institut de Recherche pour le Développement 198, Institut National de la Santé et de la Recherche Médicale Unité 1095, Institut Hospitalo-Universitaire Méditerranée Infection, Faculté de Médecine et de Pharmacie, Aix-Marseille Université, 27 Blvd Jean Moulin, 13385 Marseille CEDEX 05, France; email: jean-marc.rolain@univ-amu.fr

EMERGING INFECTIOUS DISEASES®

wwwnc.cdc.gov/eid



To subscribe online:

<http://wwwnc.cdc.gov/eid/subscribe.htm>

- Subscribe to print version
 Update mailing address

Email:

eideditor@cdc.gov

Fax:

404-639-1954

Mail:

CDC/OID/NCEZID
 1600 Clifton Rd NE :
 MS D61
 Atlanta, GA
 30329-4027

Number on mailing label: _____

Name: _____

Full mailing address: (BLOCK LETTERS)

