Tatumella ptyseos Causing Severe Human Infection: Report of the First Two Brazilian Cases

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***Tatumella ptyseos* is the type species of the *Tatumella* genus (*Enterobacteriaceae*). This fermentative Gram-negative rod has only rarely been reported as a cause of human infections; there is very little information about it in the medical literature. We report here the first two Brazilian cases of *T. ptyseos* infections, both evolving to severe sepsis.**
Key-Words: *Tatumella ptyseos*, sepsis, Brazil.

Scientific information about *Tatumella* species is scarce, as are confirmed human infections; only 10 articles were found in a recent (4/05/2008) Pubmed/Medline search. This agent was first characterized by Hollis in 1981 [1], as belonging to an unclassified bacterial group previously denominated EF-9 and named *T. ptyseos* (*Tatumella* from Harvey Tatum a CDC microbiologist, and *ptyseos*, epithet of sputum, given the large number of isolates from that source) [1]. Its biochemical properties include indole, urease, methyl red, Voges-Proskauer and gelatinase negative and phenilalanine deaminase, sucrose, and catalase positive [1,2]. Differences between *T. ptyseos* and other *Enterobacteriaceae* include a large zone of inhibition around penicillin, the tendency to die in blood agar in seven days and the small number of flagella [1,2]. DNA studies have shown *Enterobacter agglomerans* to be the closest *Enterobacteriaceae* species, but the homology does not exceed 38% [1,2]. Biochemical similarities have been observed between *T. ptyseos* and both *E. agglomerans* and *Chromobacterium violaceum*, but the DNA relatedness to the latter is only 2% [1,2]. A tight phylogenetic affiliation between *Pantoea* and *Tatumella* was recently demonstrated by partial sequencing of elongation factor Tu gene (*tuf*) and F-ATPase â sub unit gene (*atpD*) [3]. *Tatumella ptyseos* human infections have been exceedingly rare worldwide, with no previous reports of human infections from Brazilian clinical settings.

Case Reports

Case 1

In November 2007, a 41-year-old woman was admitted to the Hospital with a clinical picture of intestinal sub occlusion. She reported a gastric reduction surgery two years before; an emergency exploratory laparotomy was performed. After seven days in the ICU, where she was treated with imipenem plus metronidazole, she was discharged to the ward. Two days later she started to have high fever, chills, tremor and hypotension. Blood tests showed leucocytosis, with a shift to the left (16,100 -5% bands) and increased CRP. An intravenous central line with secretions was observed; no other obvious source of infection was identified (Normal abdominal CT, chest X ray and urinanalysis); consequently, a sepsis-associated catheter diagnosis was made. The catheter was sent to culture; it revealed positive for a nonfermentative Gram-negative rod identified by automated Microscan Baxter using a Dade Behring B101.7-119 plate as *T. ptyseos* (>99.9999% of probability and no second option), showing the following antimicrobial susceptibilities (MIC): amikacin (<16), ampicillin (>16), ampicillin/sulbactam (<8/4), ceftazidime (<2), cefazolin (<4), cefepime (<4), cephalothin (<8), ceftriaxone (16), ciprofloxacin (<0.5), cotrimoxazole (>2/38), gentamicin (<1), imipenem (>8), ofloxacin (<1), piperacillin (32), piperacillin/tazobactam (<16), ticarcillin/clavulanate (<16), and tobramycin (<4). She was put on a new antibiotic scheme with ampicillin/sulbactam; after 10 days, she was discharged, completely recovered.

Case 2

In December 2007, a 74-year-old man was admitted to the hospital with a sudden-onset high fever associated with malaise, myalgias, headache and dyspnea. His axillary temperature was 40ºC, blood pressure 60/40 mm Hg, pulse rate 140/min and respiratory rate 30/min. He suffered from type II diabetes, controlled with oral drugs. Initial laboratory tests showed leukocytosis with a left shift and a positive CRP. An admission chest X ray was normal. A diagnosis of severe sepsis was made, and initial antibiotic therapy with ampicillin/sulbactam plus ciprofloxacin started after blood cultures were taken. Given the disease's severity, the patient was transferred to the ICU for hemodynamic control. The patient remained hypotensive for three days and developed an inflammatory edema associated with lymphangytis in the lower right limb (Figure 1A). No evidence of thrombophlebitis or fasciitis was detected by image techniques. Chest X ray follow up showed an alveolar infiltrate affecting both lungs (Figure 1B). All blood cultures (TSB soy broth) revealed positive for a nonfermentative Gram-negative rod identified by automated MicroScan Baxter using Dade Behring B101.7-119 plate as *T. ptyseos* (>99.9999 % probability and no second option), showing the following antimicrobial susceptibilities (MIC): ampicillin (<2), ampicillin/sulbactam (<8/4), amikacin (32), cephalothin (<8), cefazolin (<4), cefepime (<4), ceftazidime (<2), ceftriaxone (<8), ciprofloxacin (<0.5), cotrimoxazole (<2/38), gentamicin (8), imipenem (<1), ofloxacin (<1), piperacillin (32), piperacillin/tazobactam (<16), ticarcillin/clavulanate (<16), and tobramycin (8). Immune system evaluation showed the following immunoglobulin levels (mg/

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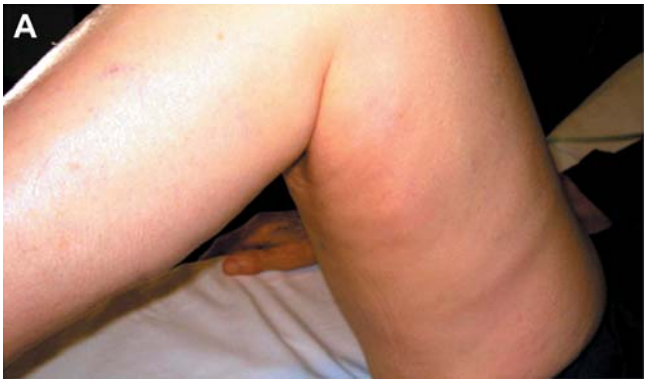
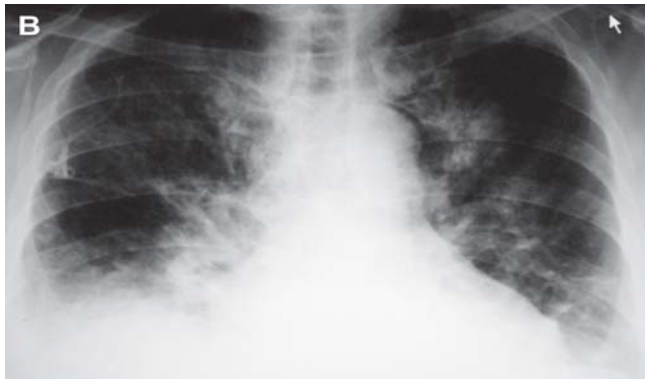
Figure 1. Right leg cellulitis and lymphangitis (A), and chest X-ray showing bilateral pneumonia (B).





mL): IgG 403, IgA 74, IgM 30, IgE (U) 11. IgG subclass levels (mg/mL) were: IgG 1 6,310 (2,396-10,835), IgG 2 2,900 (1,235-5,487), IgG 3 202 (276-1,344), and IgG 4 1620 (84-888). Complement levels (mg/mL) were C3 103 and C4 16, and CD4 and CD8 counts were 583/mm^3 and 74/mm^3, respectively. No monoclonal spike was detected in immune electrophoresis.

Discussion

The *T. ptyseos* isolates were identified by the Microscan Baxter automated system; though the VITEK automated system has been reportedly ineffective for *T. ptyseos* identification and antimicrobial susceptibility testing [4], the Microscan Baxter automated system has been considered effective [5].

Clinical information on *T. ptyseos* infection has been very limited, and isolates from sources other than sputum are uncommon [1,2], with only five cases of blood isolates reported until 2005 [6,7]. Clinical reports associate this agent with tracheobronchial/pulmonary infections (pneumonitis, asthmatic bronchitis, pharyngitis, Wegener granulomatosis, pneumonia, chronic lung disease, and pulmonary edema) [1,2,4], infection associated with pulmonary tuberculosis [8] and gastrointestinal infection (gastroenteritis) [6].

Isolation from other materials, on the other hand, has not been infrequent; this agent has already been found in soil in Brazil [9], vegetation in Japan [10], poultry carcasses in Argentina [11], edible macroalga (*Palmaria palmata*) in Ireland [12] and water supplies in South Africa [13]. Reported risk factors have been diabetes, older and younger age (neonates) and feeding tubes in neuromuscular disease patients including ataxia telangiectasis patients [1].

These two cases of sepsis, one associated with central venous catheter infection and the other associated with cellulitis, lymphangytis and pneumonia, have no parallel so far in medical literature. The isolate from a central venous catheter was apparently of nosocomial origin and showed previously-unrecorded resistance to ampicillin and imipenem [1,2,4,5]. The second case isolated from blood resulted from community-acquired disseminated infection and showed negligible antibiotic resistance. The first patient had no known immunodeficiency or risk factor, but the second had diabetes and low IgG3 levels. No DNA testing was made of the *T. ptyseos* samples, but the different biotypes (data not shown) and different antimicrobial sensitivity patterns suggest no relationship between the two isolates. The identification of two human cases of *T. ptyseos* infections, one nosocomial and the other community-acquired, should alert microbiologists and medical doctors concerning the potential patogenicity of this agent in different clinical settings in Brazil and elsewhere.

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