Seven Isolates of *Actinomyces turicensis* from Patients with Surgical Infections of the Anogenital Area in a Czech Hospital

Due to molecular biology techniques such as 16S rRNA gene sequencing, the number of new bacterial species grows continuously. However, this taxonomic reorganization has to be followed by clinical and epidemiological studies. The clinical relevance of *Actinomyces turicensis*, first identified in 1995 by Wüst et al. [5], has not been solved yet. *Actinomyces*, as a part of the indigenous microflora of human mucous membranes, may be isolated from human clinical sources without evidence of its pathogenicity [2].

*A. turicensis* has been described as a potential pathogen mostly in genital infections, followed by urinary tract infections and skin-related infections. According to the spectrum of clinical specimens in which this species has been found, it can be hypothesized that *A. turicensis* is normally present in the vagina, gut, and skin on the lower part of the body [4].

Here, we present seven cases of infections of the anogenital area caused by this microbe in the University Hospital in Plzeň (Czech Republic) from August 2009 to March 2010. The hospital is a teaching facility (1,800 beds) covering a region with approximately 650,000 inhabitants.

Microscopy and cultivation showed catalase-negative, facultative anaerobic coryneform bacteria. Conventional tests routinely used for anaerobic bacteria identification (e.g., API 20A [bioMérieux, Marcy-l’Etoile, France]) failed; therefore, the identification was carried out by sequencing of the 16S rRNA gene [3]. The sequences were analyzed using BLAST (http://blast.ncbi.nlm.nih.gov/). The microbe was identified as *A. turicensis* (99.54% homology to the sequence described by Wüst et al. [5]; GenBank accession number X78720.1). Then, API Coryne (bioMérieux, Marcy-l’Etoile, France) with prolonged incubation (3 days) in the atmosphere with 10% CO2. MICs of metronidazole and ciprofloxacin are normally used for anaerobic bacteria identification (e.g., API 20A). The above technique was also used for the identification of the microbe in the University Hospital in Plzeň. MICs of the antimicrobials were determined by broth dilution, as proposed by EUCAST (1), with prolonged incubation (3 days) in the atmosphere with 10% CO2. MICs of metronidazole and clindamycin were obtained by Etest (AB Biodisk, Solna, Sweden) after 2 days of cultivation in the anaerobic atmosphere. All strains showed similar antimicrobial patterns, with high degrees of resistance to metronidazole and ciprofloxacin. The strains were susceptible to clindamycin and penicillin (Table 1).

The first five patients, all immunocompetent young people, as well as patient 6, with insulin-dependent diabetes mellitus, suffered from infected pilonidal sinus and perianal abscesses. In two cases, *A. turicensis* was the only possible pathogen isolated from the wound under aerobic and anaerobic conditions. In the other three cases, some concomitant flora represented by anaerobic pathogens (Table 2) as well as aerobic cocci—*Streptococcus milleri* in patient 4 and *Staphylococcus aureus* in patient 5—was detected. All patients were surgically treated together with or without antibiotic therapy (clindamycin) without any known complications.

Isolate P7 was cultivated from wound swab and scrotal exudate samples obtained from a 65-year-old man with gas gangrene, together with *Prevotella* spp. The samples were taken during a bilateral orchietomy and necrectomy on the urology ward. The patient was later transferred into the emergency unit, because of sepsis. His medical history was significant for rheumatoid arthritis recently without therapy, type 2 diabetes mellitus treated by peroral antidiabetics, obesity (body mass index [BMI], 30.4), hypertension, and smoking. Under continual intravenous antibiotic therapy with penicillin (5,000,000 units every 3 h), gentamicin (240 mg every 24 h), and ornidazole (500 mg every 8 h), the clinical condition of the patient quickly improved. After the initial treatment, *A. turicensis* or any other aerobic bacterium was not isolated from the wound.

These seven reported cases are the next demonstration of the possible clinical importance of *A. turicensis*. Identification of this species using conventional biochemical tests can be difficult. Sequencing analysis of 16S rRNA is a helpful tool for the identification of such bacteria.

The nucleotide sequence reported here has been assigned to the GenBank database and has been given accession number HM210084. Strains P3, P4, and P5 have been deposited in the Czech National Collection of Type Cultures (CNCTC) (http://

### TABLE 1. Identification details and MICs of the isolates of *Actinomyces turicensis*

<table>
<thead>
<tr>
<th>Isolate</th>
<th>Biochemical identificationa</th>
<th>MIC (µg/ml) of antimicrobialb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Profile</td>
<td>ID (%)</td>
</tr>
<tr>
<td>P1 00100000</td>
<td>99.9</td>
<td>0.125 &gt;256 0.025 0.25 ≤0.06</td>
</tr>
<tr>
<td>P2 00100000</td>
<td>99.9</td>
<td>0.5 &gt;256 0.25 0.5 ≤0.06</td>
</tr>
<tr>
<td>P3 02100000</td>
<td>87.4</td>
<td>0.125 &gt;256 0.032 ≤0.125 ≤0.06</td>
</tr>
<tr>
<td>P4 00100000</td>
<td>99.9</td>
<td>0.5 &gt;256 0.06 2 ≤0.06</td>
</tr>
<tr>
<td>P5 02100000</td>
<td>87.4</td>
<td>0.25 &gt;256 0.047 2 0.125</td>
</tr>
<tr>
<td>P6 00100000</td>
<td>99.9</td>
<td>0.25 &gt;256 0.032 0.5 ≤0.06</td>
</tr>
<tr>
<td>P7 04100000</td>
<td>99.4</td>
<td>0.25 &gt;256 0.06 2 ≤0.06</td>
</tr>
</tbody>
</table>

a Biochemical identification was carried out by API Coryne (bioMérieux, Marcy-l’Etoile, France).
b API Coryne bionumber.
c Identification probability.
d Abbreviations: PEN, penicillin; MTZ, metronidazole; CLI, clindamycin; AMP, ampicillin; CTX, cefotaxime; CHL, chloramphenicol; TET, tetracycline; ERY, erythromycin; RIF, rifampin; SXT, co-trimoxazole; VAN, vancomycin; TEC, teicoplanin; CIP, ciprofloxacin; NIT, nitrofurantoin.
The study reported here was financed by the research project grant MSM 0021620819 from the Ministry of Education of the Czech Republic.

**REFERENCES**


---

**TABLE 2. Clinical characterization of the isolates of *Actinomyces turicensis***

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex</th>
<th>Age</th>
<th>Sample(s)</th>
<th>Concomitant flora</th>
<th>Diagnosis connected with the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Female</td>
<td>18</td>
<td>Wound swab</td>
<td>No</td>
<td>L05.9, pilonidal cyst without abscess</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>18</td>
<td>Wound swab</td>
<td><em>Bacteroides ureolyticus, Fusobacterium nucleatum</em></td>
<td>K61, abscess of anal and rectal regions</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>28</td>
<td>Wound secretion</td>
<td>No</td>
<td>L02.3, cutaneous abscess, furuncle, and carbuncle of buttock</td>
</tr>
<tr>
<td>4</td>
<td>Male</td>
<td>23</td>
<td>Wound swab</td>
<td><em>Streptococcus milleri, Peptostreptococcus anaerobius</em></td>
<td>K61.0, perianal abscess</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>28</td>
<td>Wound secretion</td>
<td><em>Staphylococcus aureus</em> (low quantity)</td>
<td>L05.0, pilonidal cyst with abscess</td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
<td>33</td>
<td>Wound swab</td>
<td><em>Propionibacterium acnes</em></td>
<td>L02.0, cutaneous abscess, furuncle, and carbuncle of buttock</td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>65</td>
<td>Wound swab, scrotal exudate</td>
<td><em>Prevotella spp.</em></td>
<td>A48.0, gas gangrene</td>
</tr>
</tbody>
</table>

---

Eva Chudáčková*
Lenka Geigerová
Jaroslav Hrabák
Tamara Bergerová
Department of Microbiology
Faculty of Medicine and University Hospital in Plzeň
Charles University in Prague
Plzen 305 99, Czech Republic

Václav Liška
Department of Surgery
Faculty of Medicine and University Hospital in Plzeň
Charles University in Prague
Plzen 305 99, Czech Republic

Josef Scharfen, Jr.
National Reference Laboratory for Pathogenic Actinomyces
Hospital in Trutnov
Trutnov 541 21, Czech Republic

*Phone: 420 377 10 32 64
Fax: 420 377 10 32 50
E-mail: E.C.H@seznam.cz

*Published ahead of print on 26 May 2010.