Actinobaculum spp: Clinical observation of 19 cases


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Introduction

- In 1997 with the help of 16S rRNA sequencing, Lawson and al. reclassified Actinomyces suis in the genus Actinobaculum and place the human strain in a new species: Actinobaculum schaali [1]
- In 2002 two new species were added: Actinobaculum massiliae and urinale [2, 3]

• Actinobaculum spp are:
  - Gram-positive, straight to slightly curved, nonmotile, facultatively anaerobic rods.
  - Isolated from human urine, blood and pus [4]
  - Causing predominantly UTI in patients with underlying genitourinary tract pathology, but also osteomyelitis, sepsisemia and superficial skin infections [5, 6, 7, 8]
  - Underestimated and undiagnosed because of the difficulty to be isolated and identified with standard laboratory techniques, due to its resemblance to normal bacterial flora.

Methods

- Retrospective study with all known cases of Actinobaculum spp. infections identified since 2004 in the canton of Neuchâtel, Switzerland.
- Chart review of all patients suffering from Actinobaculum spp. infection, with special attention to demographic characteristics, clinical status and laboratory values.
- Strains were cultivated and isolated in the bacteriology laboratory by its routine procedure. Identification with API 32 A gallery and 16S rRNA gene sequencing.

Results

- 20 positive samples could be found in 19 patients: 10 urine (50%), 6 blood (30%), 1 blood and urine (5%), and 3 pus (15%)
- Sex ratio was 11M/8F
- Patients’ ages ranged from 16 to 91 years with 60% being over 70 years.
- 15/18 (83%) cases with either blood or urine specimens had underlying genitourinary tract pathologies.
- When urine cultures were positive for Actinobaculum spp., leukocytes were found in all samples (8/8) as and Gram positive rods in 9/10 (90%) but nitrite tests were always negative 8/8.
- Onset of appropriate treatments was delayed by an average of 2.7 days (0-13), due to the diminished sensitivity of Actinobaculum spp. to the commonly used antibiotics in UTI (ciprofloxacin, sulfamethoxazol/trimethoprim) and to the length of microbiological diagnosis.
- 10/20 (50%) of the cases were outpatients, of whom 8/10 (80%) had a benign infection (cystitis or skin abscess) and 2/10 (20%) a major infection (pyelonephritis, abscess).
- 10/20 (50%) of the cases were hospitalized, of whom 7/10 (70%) had a major infection (pyelonephritis, abscess).
- Antibiotic resistance:
  - 1. gram positive rods*** 9/10 (90%)
  - 2. leukocytes 8/8 (100%)
  - 3. B-lactams 8/10 (80%)
  - 4. sulfamethoxazol/trimethoprim 7/10 (70%)
  - 5. quinolones 7/10 (70%)

- Comorbidities:
  - 1. Hypertension
  - 2. Chronic kidney failure
  - 3. Diabetes
  - 4. Kidney transplantation
  - 5. Dialysis
  - 6. Hypercholesterolemia
  - 7. Ischemic heart disease
  - 8. Cancer
- Time to diagnosis 8.4 days (2-25)
- Time to accurate treatment 2.8 days (0-13)

- 1. gram positive rods
  - 2. gram negative rods
  - 3. staphylococci
  - 4. beta-lactams
- 5. quinolones

- Cases of leukocyturia with negative nitrite test but presence of Gram positive rods, in patients with an underlying genitourinary tract pathology, Actinobaculum spp. should specially be searched instead of considering clinically irrelevant colonization by Corynebacteria.
- Actinobaculum spp. are:
  - clinically relevant as 15/20 (75%) of the patients were symptomatic of their infection.
  - probably much more common than thought, as we are finding more specimens since our laboratory is actively looking for it.
  - important to isolate because of the diminished sensitivity to the commonly used antibiotics in UTI (ciprofloxacin, sulfamethoxazol/trimethoprim).
  - easily treated with beta-lactams.
- A prospective study on Actinobaculum spp. infections should be performed to answer these questions.

Conclusion

- In case of leukocyturia with negative nitrite test but presence of Gram positive rods, in patients with an underlying genitourinary tract pathology, Actinobaculum spp. should specially be searched instead of considering clinically irrelevant colonization by Corynebacteria.

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References

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