

A rare case of sepsis due to *Corynebacterium macginleyi* from central venous catheter in an elderly woman

Marco Mosele, Nicola Veronese, Francesco Bolzetta, Enzo Manzato, Giuseppe Sergi

Department of Medical and Surgical Sciences, Division of Geriatrics, University of Padova

SUMMARY

Corynebacterium macginleyi is a gram positive rod that causes especially ocular infections: since now only six elderly cases of extraocular infection are described. A 76 years old bedridden woman with a central venous catheter was hospitalized for 10 days of persistent fever. She was treated before with vancomycin and then with imipenem. The clinical conditions improved and the patient was discharged after two weeks of hospitalization. Among recognised risk factors for this infection the advanced age, indwelling devices and immunosuppression seem the most important. On the other hand, the antibiotics of choice are glycopeptides while the association of another antibiotic is recommended in our opinion only in severe clinical manifestation

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Corynebacterium macginleyi is a gram positive rod, member of the lipophilic group of the genus *Corynebacterium*. It was first identified in 1995 by Riegel *et al.* during investigations on lipophilic corynebacteria and defined as an exclusively conjunctival pathogen (Giammanco *et al.*, 2002). Nowadays there is evidence that *C. macginleyi* can lead to extraocular infections in predisposed patients: to date only six cases of extraocular infection have been described. In 2002, Villanueva *et al.* published for the first time the case of a male patient with neurogenic bladder and vesical stones who presented with a urinary tract infection (Villanueva *et al.*, 2002). In 2003, two more cases of extraconjunctival infection were documented: one of them was an intravenous catheter-related infection (Dobler *et al.*, 2003) and the other was a case of endocarditis, without systemic complications (Pubill Succarat *et al.*, 2003). Another case of endocarditis was reported by

Tejada Evans in 2007 (Tejada Evans 2007). Villamil-Cajoto *et al.* described the first case of fatal septicaemia in an immunocompromised adult patient (Villamil-Cajoto *et al.*, 2007). Finally, Dias reported a case of *Corynebacterium macginleyi* isolated from the tracheostomy site of a patient with carcinoma of the larynx (Dias *et al.*, 2010). In these cases the mean age of the patients was about 70 years and all were male with severe comorbidity. There were no signs of keratitis or intraocular infection or inflammation in any patient. We report the second case of catheter-related septicaemia, the first with a good exitus in a woman. A 76-year-old woman was hospitalized in October 2010 at the Geriatric Clinic, University of Padua, for 10 days of persistent fever. At admission corporal temperature was 38.2°C, blood pressure was 90/54 mmHg with heart rate 120 bpm. The patient had a clinical history of MGUS, diabetes mellitus type 2, vascular dementia and she was bedridden after a stroke (July 2008). For anorexia correlated to severe dementia, a central venous catheter was already present in the femoral vein for parenteral nutrition and managed in the nursing home. Cardiopulmonary and abdominal examinations were normal.

Corresponding author

Dr. Nicola Veronese

Clinica Geriatrica, Ospedale Giustiniano

Via Giustiniani, 2 - 35128 Padova, Italy

E-mail: ilmannato@tiscali.it

Neurological examination demonstrated signs of remote stroke (right hemisindrome). No signs of ocular infection were evident. Chest ray and electrocardiogram were negative. Laboratory examinations demonstrated normal renal function, neutrophil leukocytosis, anaemia, monoclonal gammopathy (Bence Jones proteinuria was negative) and bacteria in urine with negative urine culture. For the persistence of fever we suspected sepsis starting from the CVC. Serial blood cultures were performed from a peripheral vein and from the CVC, then an empiric antibiotic therapy with vancomycin (500 mg I.V. twice daily) as suggested by Mermel *et al.* was started (Mermel *et al.*, 2001).

Subsequently, based on microscopic examination of the blood cultures, colony morphology and biochemical reactions a preliminary diagnosis of *Corynebacterium* species was made. The commercial API Coryne system was used together with the API Coryne database 2.0, according to the manufacturer's instructions, and our strain was identified with a very good profile acceptance (98.2%) as a *Corynebacterium macginleyi*. Furthermore, the complete 16S rRNA (~1.5 kb) and the partial *rpoB* genes were amplified. The DNA sequences were compared to published sequences retrieved from the GenBank database (National Center for Biotechnology Information, National Library of Medicine, Bethesda, MD, USA). CLUSTAL W software, originally described by Thompson *et al.*, (Thompson *et al.*, 1994) was used to align the sequences, calculate percentages of similarity, and construct a phylogenetic tree.

Both the 16S rRNA gene sequences obtained from the clinical isolates had 98.2% similarity to sequences from both *C. macginleyi* CIP 104099 and *C. accolens* CIP 104783. The *rpoB* sequences of both isolates showed 97.7 and 90.2% similarity to the sequences from *C. macginleyi* (CIP 104099) and *C. accolens* (CIP 104783) respectively. The third day after the beginning of the therapy, temperature was 37.8°C, so we repeated another peripheral and central blood culture that confirmed the presence of this pathogen.

An antibiogram was performed and confirmed the sensitivity of our strain to glycopeptides and imipenem. Due to the poor clinical condition of the patient we preferred to add intravenous imipenem (1 g I.V. tid). The central venous

catheter was changed and after three days of antibiotic therapy the patient became afebrile. The following blood cultures performed at six and ten days were negative. The clinical conditions improved and the patient was discharged after two weeks of hospitalization. The extraocular infection of *Corynebacterium macginleyi* is thought to be a very rare condition, but an increasing number of cases in the last decade have been described, suggesting that infections by this pathogen are likely to become more widespread (Euguchi *et al.*, 2008). Among recognised risk factors the most relevant seem to be advanced age and the presence of indwelling devices and immunosuppression, while conjunctival infections could occur also in healthy and younger people. The recent discovery of this bacterium, the increased lifespan of immunocompromised patients and the most intensive use of indwelling devices are probably responsible for the increasing cases reported in literature.

In our case the recognized risk factors were the immunodepression related to diabetes, the immobilization syndrome and the presence of a central venous catheter. MGUS was not an acknowledged risk factor, but it may influence the progression of this disease: more studies are necessary to verify the importance of this condition. Similar conditions were present in the cases reported to date.

The clinical manifestation of this infection is often very severe: among the six cases in the literature, two were severe endocarditis and two were septicæmias, fatal in one case. Our case confirmed that *Corynebacterium macginleyi* is not usually an ordinary systemic pathogen, but compromised clinical conditions can set off this opportunistic infection. The lack in any reported cases of ocular involvement suggests that probably the first site of infection is not necessarily ocular surfaces. On the other hand, the isolation of this pathogen from a catheter used in femoral veins implies that the genitourinary region could be another possible habitat of this organism as suggested by Dobler (Dobler et Braveny, 2003). Revisiting the current literature on *Corynebacterium macginleyi*, the antibiotics of choice seem to be glycopeptides while the susceptibility to other antibiotic classes is variable. Ocular infections seem to have a sensitivity to larger antibiotic classes than systemic ones. High-level fluoro-

quinolone resistance is reported in some recent ophthalmic isolates of *Corynebacterium macginleyi* (Eguchi *et al.*, 2008) while the same resistance is observed in all the reported non-ocular cases, including the present report. About the other classes of antibiotics, the sensitivity was variable. In our case we preferred to associate vancomycin and imipenem that has a broader spectrum activity according to the other case proposed by Dobler and Braveny (Dobler *et al.*, 2003) in which early intervention with vancomycin was necessary to avoid death. So, the early use of glycopeptides is fundamental while the use of another antibiotic based on antibiogram is recommended only in severe clinical manifestations as soon as possible. Our case is so far the only one concerning a woman. Unfortunately, the small number of cases in the literature and risk factors in men than women are not known. Further studies are necessary to clarify this discrepancy. We conclude that *Corynebacterium macginleyi* can lead to severe clinical manifestations in immunodepressed patients and its resistance to antibiotic therapy can have serious outcome in frail patients.

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