Corynebacterium macginleyi isolation from conjunctival swab in Italy

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Abstract

Corynebacterium macginleyi was isolated from conjunctival swabs of a farmer suffering from purulent conjunctivitis. This species has only recently been reported in Switzerland and Germany to be exclusively isolated from ocular surfaces. This represents the first isolation of C. macginleyi in Italy indicating that its circulation is not geographically limited. © 2002 Elsevier Science Inc. All rights reserved.

1. Case report

The species Corynebacterium macginleyi has been recently described by Riegel and coll. (Riegel et al., 1995) as a result of comprehensive investigation of lipophilic corynebacteria. Since the original description including three strains isolated from eye specimens, only 25 clinical isolates of C. macginleyi have been reported in the literature. All of these clinical strains have been isolated from conjunctival swabs in Switzerland (Funke et al., 1998) and Germany (Joussen et al., 2000).

We isolated C. macginleyi from a conjunctival swab of a 65 year old farmer living in a rural area in Western Sicily and suffering from bilateral conjunctivitis. According to the physician in charge, the patient showed conjunctival hyperaemia with a whitish discharge, loss of visual acuity and corneal ulcers, but with no signs of intraocular infection.

The conjunctival sample was cultured on Columbia agar plates (Becton Dickinson BBL, Cockeysville, Md.) supplemented with 5% sheep blood (SBA) and chocolate agar (Becton Dickinson) at 37°C both in a 5% CO2-enriched atmosphere and in ambient air and on MacConkey agar (Becton Dickinson) at 37°C in ambient air. Very small colonies of Gram+ pleomorphic rods were observed after 48 h incubation on SBA. No growth was observed on chocolate agar and MacConkey agar. Gram’s stain revealed coryneform rods forming arrangements similar to Chinese letters. The commercial API Coryne system (bioMérieux, Marcy l’Etoile, France) was used according to the manufacturer’s instructions for identification of the isolate. The numerical code 5100305 was obtained after 24 h incubation and used for species identification with API Coryne database 2.0 (Funke et al., 1997). API Coryne system unequivocally identified the isolate as C. macginleyi and the numerical code obtained corresponded to the one more frequently encountered by Funke and coll. (Funke et al., 1998). Moreover, an identical identification code was obtained with C. macginleyi type strain (ATCC 104099T).

The Corynebacterium isolate was confirmed to be lipophilic by testing its growth on Tween 80-supplemented SBA (Riegel et al., 1995). Our isolate grew well on both 0.1 and 1% Tween-supplemented SBA.

Antimicrobial susceptibility patterns were determined by the agar diffusion method. Our strain was susceptible to a large panel of antibiotics including: amoxicillin/clavulanate, clindamycin, erythromycin, gentamicin, penicillin G, chloramphenicol, rifampicin, tetracycline, vancomycin, ceftazidime, enrofloxacin, and kanamycin.

In order to determine the phylogenetic position of our isolate, 16S rRNA gene was amplified by polymerase chain
reaction and sequenced by GenomeExpress (Montreuil, France). The sequence of our clinical isolate was compared and aligned to published 16S rRNA sequences searched with NCBI taxonomy browser (National Center for Biotechnology Information, National Library of Medicine, Bethesda, MD, USA; http://www.ncbi.nlm.nih.gov) and retrieved from GenBank. The retrieved 16S rRNA sequences belonged to nine reference strains of six different species of lipophilic Corynebacteria, including C. macginleyi type strain, and three strains of CDC Groups F-1 and G. The EMBL/GenBank accession numbers for the 16S rRNA sequences were as follows: C. accolens ATCC 4972T, X80500; C. afermentans afermentans CIP 103499T, X82054; C. afermentans lipophilum CIP 103500T, X82055; C. bovis NCTC 3224T, X84444; C. jeikeium ATCC 43216, U87816; C. jeikeium ATCC 43217, U87815; C. jeikeium ATCC 43218, U87823; C. CDC Group F-1 CDC G5911, X81904; C. CDC Group F-1 G4330, X81905; C. CDC Group G CDC G5840, X80498; C. urealyticum ATCC 43042T, X81913; C. macginleyi ATCC 104099T, X80499.

Phylogenetic analysis included sequence alignment, calculation of percent sequence similarity, construction of a phylogenetic tree, and assessment of the tree topology by bootstrap analysis, which was performed by Clustal method with Weighted residue weight table using DNAstar software (DNASTAR Inc., Madison, WI, USA). In the phylogenetic tree (Fig. 1) our clinical isolate clustered together with C. macginleyi published sequence showing 98.7% sequence similarity (0.4 divergence). 16S rDNA sequence similarity above 97% should be considered sufficient to consider two strains as belonging to the same species (Stackebrandt & Goebel, 1994). The 16S rRNA gene sequence obtained for the Italian C. macginleyi isolate has been deposited in the GenBank sequence data-base and given accession no. AF490772.

As confirmed by 16S rDNA sequence analysis API Coryne system is affordable in identifying C. macginleyi isolates. Growth on Tween 80-supplemented SBA can be used to detect lipophilic isolates but further biochemical tests are needed for species identification.

C. macginleyi is reported to predominantly affect already injured conjunctivas or superinfect during conjunctivitis caused by other bacterial micro-organisms or viruses (Funke et al., 1998; Joussen et al., 2000). No other bacteria could be isolated from our sample but, unfortunately, it was not submitted for viral or Chlamydia isolation, so that bacterial superinfection of a viral or chlamydial etiology can not be excluded.

The patient recovered uneventfully three weeks after sampling following Colbiocin (chloramphenicol + colistin + tetracycline) antibiotic drops treatment. According to the literature, our isolate was susceptible to a large panel of antibiotics including chloramphenicol and tetracycline. Delayed recovery could be explained by the scarce compliance of our patient toward therapy. Other three members of the same family showed similar symptoms but they were not sampled because they had already started antibiotic treatment. They all recovered after antibiotic drops treatment but, in the absence of isolation, the occurrence of a C. macginleyi epidemic remains a mere speculation.

Our finding of a case of conjunctivitis associated to C. macginleyi isolation in Italy confirms Joussen’s and coll. indication that the presence of this micro-organism is not geographically limited (Joussen et al., 2000).

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References


