Case Report

Endophthalmitis due to *Williamsia muralis*

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A case of endophthalmitis caused by *Williamsia muralis* is described. The infection occurred following a procedure known as intravitreal triamcinolone acetonide injection for the treatment of diabetic maculopathy. This is the first report of *W. muralis* as a causative agent of endophthalmitis.

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Case report

A 66-year-old male with a history of diabetes mellitus presented to the ophthalmology clinic with reduced visual acuity and pain in the left eye. Twenty-four hours earlier, he had undergone a procedure known as intravitreal triamcinolone acetonide (IVTA) injection for the treatment of diabetic maculopathy. On examination, visual acuity in the left eye was reduced to perception of ‘hand movement’, whereas the right eye showed 6/36 vision. On slit-lamp examination, many cells were seen in both the aqueous chamber and in the vitreous fluid, consistent with a diagnosis of endophthalmitis.

Vitreous fluid (0.1 ml) was aspirated and sent for analysis. The Gram stain was negative for white cells and bacteria. The remainder of the specimen was inoculated onto GC agar [Oxoid GC agar base + 5% chocolate horse blood + essential growth factor supplement 1% (IsoVitalex)] and into serum broth. No growth was observed in serum broth. No other micro-organism was cultured from the specimen. Gram staining of the colonies showed short Gram-positive bacilli that tested positive for catalase. The organism was not acid-fast on Kinyoun’s staining. Biochemical characterization using the API Coryne Identification System (bioMérieux) showed positive reactions for alkaline phosphatase, α-glucosidase and catalase (biocode 0110004) after 24 h incubation. A detailed electron microscopic investigation showed that the cells were coccoid to irregular, with a dense ‘fuzzy coat’ surrounding the capsule (Fig. 1).

The 16S rRNA gene was analysed as described by Kämpfer et al. (2003). The 16S rRNA sequence of strain 9571414 J (the patient isolate) was a continuous stretch of 1428 bp. Sequence similarity calculations after a neighbour-joining analysis indicated that the closest relative of strain 9571414 J was *Williamsia muralis* DSM 44343T, accession number Y17384 (98.4%). Fatty acid analysis of whole-cell hydrolysates, prepared after growth on trypticase soy broth agar for 24 h at 28 °C in air, using the Sherlock System (MIDI) and comparison with the Sherlock database provided the identification of *Gordonia terrae* with a similarity index of 0.828 and 0.796 (results not shown). Alternatively, when the identification method based on growth on trypticase soy agar containing 5% defibrinated sheep blood incubated at 35 °C in air was used, the organism could not be clearly separated between *Nocardioides*, *Rhodococcus* and *Gordonia* species (similarity index ≤0.1 between first and third choice). Results of the physiological characterization (biochemical tests based on carbon substrate utilization and hydrolysates of various chromogenic substrates according to Kämpfer et al., 1991) for strain 9571414 J were in accordance with those reported for *W. muralis* DSM 44343T (Kämpfer et al., 1999). DNA–DNA hybridization experiments were performed with 9571414 J and *W. muralis* DSM 44343T using the method described by Ziemke et al. (1998) modified as described by Kämpfer et al. (1991). Strain 9571414 J showed 100% DNA–DNA similarity (mean value of two hybridizations) to *W. muralis* DSM 44343T, indicating clearly that the strain is a member of this species.

MIC estimation was performed on the isolate using the Etest method (AB Biodisk). A 0.5 McFarland suspension of the isolate was lawn-inoculated onto GC agar plates, and Etest strips containing benzylpenicillin, ciprofloxacin, ceftazidine and vancomycin were placed onto the plates. The plates were then incubated at both 30 °C and 35 °C in 5% CO₂, and read at 24 h intervals together with control plates. Confluent growth was observed on the control plate incubated at 30 °C for 48 h; there was minimal growth on the control plate incubated at 35 °C for 72 h. MICs were

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Abbreviation: IVTA, intravitreal triamcinolone acetonide.

The GenBank/EMBL/DDBJ accession number for the 16S rRNA gene sequence of isolate 9571414 J is AM409316.
therefore estimated following growth at 30 °C for 48 h, with the following results: benzylpenicillin, 1 mg l⁻¹; vancomycin, 1 mg l⁻¹; ciprofloxacin, 0.125 mg l⁻¹; and ceftazidime, >32 mg l⁻¹.

The patient received intravitreal vancomycin (10 mg) and ceftazidime (20 mg) immediately following the collection of the vitreous fluid specimen as per institutional protocol. On review the following day, improvement in visual acuity in the left eye to 'count fingers' was noted, but a small hypopyon (pus in the anterior chamber) was present, and moderate numbers of cells were seen in both the aqueous chamber and vitreous on slit-lamp examination. By the time that the organism had been isolated, the patient had been discharged for follow-up; visual acuity improved, but remained reduced at 6/36. Given the temporal relationship between the injection and the development of endophthalmitis (24 h), the fact that there was no clinical suspicion of endogenous endophthalmitis, and the fact that no other organism was identified on culture, it was considered likely that *W. muralis* was the cause of this infection and was inoculated into the eye at the time of IVTA injection. However, as the equipment used to administer the injection and the medication vial containing triamcinolone had been disposed of by the time that the organism was isolated, the source of the infection could not be proven. No further cases of *W. muralis* endophthalmitis have been identified at our institution either prior to, or subsequent to, this case.


*W. muralis* has been isolated from indoor building materials (Kämpfer *et al.*, 1999). Only one clinical case of respiratory tract infection by *W. muralis* has been described so far (del Mar Tomas *et al.*, 2005).

A second *Williamsia* species, *W. deligens*, has been isolated from clinical specimens, but no infection has been reported along with the description of this species (Yassin & Hupfer, 2006). To our knowledge, this is the first report of a 'sterile-site' infection caused by *W. muralis*.

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**References**


