Case Report

Traumatic endophthalmitis caused by *Staphylococcus gallinarum*

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Herein, we describe what we believe to be the first case of traumatic endophthalmitis caused by *Staphylococcus gallinarum*, following injury with an iron nail. The patient was successfully treated by vitrectomy and intravitreal injection of cefazolin and vancomycin.

Introduction

The coagulase-negative staphylococcus *Staphylococcus gallinarum*, originally isolated from the skin of a chicken, is a rare pathogen in humans (Devriese *et al.*, 1983). To the best of our knowledge, no ocular infections have previously been reported with *S. gallinarum*. Herein, we describe a case of traumatic endophthalmitis due to *S. gallinarum* following injury with an iron nail.

Case report

A 33-year-old male presented with a history of trauma from an iron nail in the left eye of 1 day duration. At presentation, his visual acuity was finger-counting at 3 metres. There was a radial 6 mm full-thickness corneal laceration in the superonasal quadrant, 2+ corneal stromal oedema, 4+ cells, 2+ flare and a 1 mm hypopyon in the anterior chamber. A consensual pupillary reflex was elicited. The lens showed an early cataract. The fundus view was hazy. B-scan ultrasonography showed the presence of low-intensity echoes and a few membranes in the mid and posterior vitreous cavity with an attached retina. A clinical diagnosis of left eye open globe injury (zone 1, type B, grade 3, pupil negative) with suspected endophthalmitis was made. The patient underwent corneal tear repair and vitreous biopsy and was given intraocular antibiotics vancomycin 1 mg and ceftazidime 2.25 mg in 0.1 ml each on the same day. Postoperative treatment included oral ciprofloxacin 750 mg twice a day, topical ciprofloxacin and topical betamethasone one hourly, along with topical homatropine four times a day.

A vitreous sample was sent to microbiology services for smears and culture. Direct microscopic examination of the vitreous showed Gram-positive cocci in pairs and clusters. Pure growth of large (10–15 mm), flat and opaque colonies

was observed on blood and chocolate agar plates after 24 h of incubation. Gram stain of the colonies revealed Gram-positive cocci arranged in clusters suggestive of staphylococci. The Gram-positive cocci were catalase-positive and tube coagulase-negative. The coagulase-negative staphylococcus (CoNS) isolate was further identified to species level by following the Kloos & Schleifer (1975) scheme of identification and by using mini API ID 32 Staph strips (bioMérieux). The CoNS isolate was novobiocin-resistant, produced urease and alkaline phosphatase, reduced nitrate and fermented glucose, fructose, maltose, mannose, trehalose and ribose. Based on biochemical reactions and mini API ID 32 Staph (% ID=99.9; $T=0.83$), the CoNS isolate was identified as *S. gallinarum*. Antibiotic susceptibility testing of the isolate was done by the Kirby–Bauer disc diffusion method as per Clinical and Laboratory Standards Institute guidelines (CLSI, 2009). The organism was sensitive to ciprofloxacin, gatifloxacin, moxifloxacin, ofloxacin, cefazolin, vancomycin, amikacin and gentamicin and resistant to oxacillin and ceftazidime.

Since the clinical condition showed no improvement after 5 days due to an increased anterior chamber reaction, non-resolution of the hypopyon and dense vitreous opacities, the patient underwent pars plana vitrectomy to clear the media. During the surgery, active vitreous exudates were noted and repeat intraocular antibiotics cefazolin (2.25 mg in 0.1 ml) and dexamethasone (400 µg in 0.1 ml) were given in the left eye for possible persistent infection. The patient's postoperative course stabilized and endophthalmitis resolved over the next 4 weeks. Ten weeks after initial presentation, he underwent lens aspiration and intraocular lens implantation for the cataract. The final best corrected visual acuity was 20/50 6 weeks later.

Discussion

CoNS have emerged as significant pathogens, especially in immunocompromised patients, premature newborns and

Abbreviation: CoNS, coagulase-negative staphylococcus/staphylococci.

patients with implanted biomaterials (Heikens *et al.*, 2005). The most frequently encountered CoNS species associated with human infections is *Staphylococcus epidermidis*, followed by *Staphylococcus haemolyticus*. Other CoNS species associated with human infections are *Staphylococcus saprophyticus* and *Staphylococcus lugdunensis* (Heikens *et al.*, 2005).

S. gallinarum has been isolated from chickens and pheasants (Devriese *et al.*, 1983) and also from saliva of healthy humans (Ohara-Nemoto *et al.*, 2008). There are only two reports of human infection with *S. gallinarum*. Kolawole & Shittu (1997) isolated six strains of *S. gallinarum* from septic wounds of hospital patients. They identified the organism to species level by using ATB Staph (API; bioMerieux), the Baird–Parker method and sugar tests of Kloos & Schleifer (1975) and by a hybridization assay. Yu *et al.* (2008) isolated *S. gallinarum* from blood cultures in a patient with chronic hepatitis B virus infection, who presented with low-grade fever accompanied by increased upper abdominal pain, nausea and weakness. They identified the CoNS isolate to species level based on biochemical reactions and 16S rRNA gene sequencing. In our case, *S. gallinarum* was identified to species level based on routine biochemical tests and API ID 32 Staph. Ieven *et al.* (1995) reported that 95% of CoNS were identified as the correct species by API ID 32 Staph. Heikens *et al.* (2005) compared genotypic and phenotypic methods for identification of CoNS to species level and found that *tuf* gene sequencing was the best method for identification of CoNS and that the API Staph test was a reliable alternative phenotypic method. To the best of our knowledge, no other case of ocular infection due to *S. gallinarum* has been reported to date. The source of *S. gallinarum* in our case could not be properly mapped. Since this organism has been found in saliva of healthy humans (Ohara-Nemoto *et al.*, 2008), the patient was asked whether he put saliva in the eye, as smearing their saliva on wounded areas is a common practice for many people, especially in rural areas. The patient denied any such practice.

We treated the post-traumatic endophthalmitis in our patient firstly by corneal tear repair with a vitreous biopsy and intraocular antibiotics (vancomycin and ceftazidime) but the clinical condition did not show substantial improvement due to significant vitreous opacification. The isolate showed resistance to ceftazidime, which is one of the most commonly used antibiotics in the treatment of endophthalmitis. Our patient had also received a vancomycin injection, to which the organism was sensitive, and

it is our understanding that this drug stopped the clinical progression of the infection. However, because the bulk of the vitreous was hazy, we had to surgically remove the opacities and at this time the surgeon chose to inject cefazolin, to which the organism was sensitive. This drug is less expensive and more readily available with a large margin of safety. Treatment resulted in eradication of the ocular infection and restoration of very good vision.

To our knowledge, this is the first case of traumatic endophthalmitis caused by *S. gallinarum*, following injury with an iron nail. The patient was successfully treated by vitrectomy and intravitreal injection of cefazolin and vancomycin.

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References

- CLSI (2009). *Performance Standards for Antimicrobial Disk Susceptibility Tests*, Approved Standard, 10th edn, M02-A10. Wayne, PA: Clinical and Laboratory Standards Institute.
- Devriese, L. A., Poutrel, B., Kilpper-Bälz, R. & Schleifer, K. H. (1983). *Staphylococcus gallinarum* and *Staphylococcus caprae*, new species from animals. *Int J Syst Bacteriol* **33**, 480–486.
- Heikens, E., Fleer, A., Paauw, A., Florijn, A. & Fluit, A. C. (2005). Comparison of genotypic and phenotypic methods for species level identification of clinical isolates of coagulase negative staphylococci. *J Clin Microbiol* **43**, 2286–2290.
- Ieven, M., Verhoeven, J., Pattyn, S. R. & Goossens, H. (1995). Rapid and economical method for species identification of clinically significant coagulase-negative staphylococci. *J Clin Microbiol* **33**, 1060–1063.
- Kloos, W. E. & Schleifer, K. H. (1975). Simplified scheme for routine identification of human *Staphylococcus* species. *J Clin Microbiol* **1**, 82–88.
- Kolawole, D. O. & Shittu, A. O. (1997). Unusual recovery of animal staphylococci from septic wounds of hospital patients in Ile-Ife, Nigeria. *Lett Appl Microbiol* **24**, 87–90.
- Ohara-Nemoto, Y., Haraga, H., Kimura, S. & Nemato, T. K. (2008). Occurrence of staphylococci in the oral cavities of healthy adults and nasal–oral trafficking of the bacteria. *J Med Microbiol* **57**, 95–99.
- Yu, D., Chen, Y., Pan, Y., Li, H., McCormac, M. A. & Tang, Y. W. (2008). *Staphylococcus gallinarum* bacteremia in a patient with chronic hepatitis B virus infection. *Ann Clin Lab Sci* **38**, 401–404.