

diminished vision of two days duration following iatrogenic injury to his left eye by a hypodermic needle. Best corrected visual acuity (BCVA) was 20/20 in right eye and perception of light with accurate projection of light rays in the left eye. On examination, a self-sealed scleral laceration was noted near the temporal limbus of the left eye. Hypopyon with fibrinous pupillary membrane noted in the anterior chamber obscured view of the fundus. Ultrasonography showed multiple low reflective vitreous membranes with after movements. A diagnosis of post-traumatic endophthalmitis was made and the patient underwent pars plana lensectomy, vitrectomy and intraocular antibiotic injection of vancomycin 1 mg / 0.1 ml and amikacin 400 µgm / 0.1 ml. The patient was treated with ciprofloxacin eye drops and betamethasone eye drops hourly and cyclopentolate eye drops thrice daily. Oral ciprofloxacin 750 mg twice a day and oral prednisolone 70 mg /day (1 mg/kg) were also administered. The right eye was normal.

Enterobacter spp. isolated from vitreous and identified by API 20 E (bioMérieux, France) on the third postoperative day was resistant to vancomycin, amikacin, ceftazidime, ciprofloxacin, gatifloxacin, chloramphenicol and cefazolin by Kirby Bauer disc diffusion method.

Since there was no improvement clinically and the isolated organism was resistant to intravitreally administered antibiotics, he was injected intravitreally, combination of tazobactam and piperacillin (225 µgm /0.1 ml) based on available experimental data.^{3,4} Systemic corticosteroids were continued and ciprofloxacin was discontinued. Four days after the intravitreal injection, vitritis decreased with BCVA improving to 20/80. At one month BCVA was 20/40 with resolution of vitritis.

Enterobacter spp. develop resistance rapidly to antibiotics due to their capacity to produce extended spectrum beta-lactamases.⁵ Piperacillin and tazobactam complement in their mechanism of action against beta-lactamase-producing organisms. Due to the production of high levels of beta-lactamase, combination therapy with piperacillin and tazobactam is a safe and effective alternative in the management of multi-drug-resistant gram-negative infections.^{6,7}

To conclude, intravitreal injection of piperacillin and tazobactam could be effective in the management of multi-drug-resistant endophthalmitis caused by gram-negative bacteria.

***Enterobacter* endophthalmitis: Treatment with intravitreal tazobactam - piperacillin**

Dear Editor,

Traumatic endophthalmitis is not uncommon following hypodermic needle injury and is associated with severe ocular morbidity.^{1,2} *Enterobacter* is a ubiquitous gram-negative bacillus rarely associated with endophthalmitis. We report the first case of multi-drug-resistant endophthalmitis caused by *Enterobacter* species treated with intravitreal piperacillin and tazobactam (Medline Search).

A 25-year-old male presented with pain, redness and

Trehan Hemant Singh, MS; Avinash Pathengay, DO;
Taraprasad Das, MD; Savitri Sharma, MD

Kannuri Santhamma Retina Vitreous Centre, Hyderabad LV Prasad Eye Institute, Hyderabad, (THS); Visakhapatnam LV Prasad Eye Institute, Visakhapatnam, (AP); Bhubaneswar LV Prasad Eye Institute, Bhubaneswar, India (TD,SS).
E-mail: avinash@vizag-lvpei.org

References

1. Jalali S, Das T, Majji AB. Hypodermic needles: A new source of penetrating ocular trauma in Indian children. *Retina* 1999;19:213-7.
2. Das T, Kunimoto DY, Sharma S, Jalali S, Majji A, Nagaraja RT, et al. Relationship between clinical presentation and visual outcome in

postoperative and posttraumatic endophthalmitis in South Central India. *Indian J Ophthalmol* 2005;53:5-16.

3. Ozkiris A, Evereklioglu C, Kontas O, Oner AO, Erkilic K. Determination of nontoxic concentrations of piperacillin/tazobactam for intravitreal application. An electroretinographic, histopathologic and morphometric analysis. *Ophthalmic Res* 2004;36:139-44.
4. Ozkiris A, Evereklioglu C, Esel D, Akgun H, Goktas S, Erkilic K. The efficacy of piperacillin / tazobactam in experimental *Pseudomonas aeruginosa* endophthalmitis: A histopathological and microbiological evaluation. *Curr Eye Res* 2005;30:13-9.
5. Sanders WE Jr, Sanders CC. *Enterobacter* spp: Pathogens poised to flourish at the turn of the century. *Clin Microbiol Rev* 1997;10:220-41.
6. Gupta N, Aparna, Choudhary U, Garg N, Arora DR. *Enterobacter bacteremia*. *J Assoc Physicians India* 2003;51:669-72.
7. Mohanty S, Singhal R, Sood S, Dhawan B, Das BK, Kapil A. Comparative *in vitro* activity of beta-lactam/beta-lactamase inhibitor combinations against gram negative bacteria. *Indian J Med Res* 2005;122:425-8.