

## POST OPERATIVE ENDOPHTHALMITIS - Changing Paradigms

**Introduction:** Chances are few and far in between that an ophthalmologist's name or photograph, find its place onto the first page headlines of a national newspaper. When it has rarely occurred it has almost always been in related to an epidemic of post operative endophthalmitis. While many pages of all standard ophthalmic texts are devoted to complications, none other can give the ophthalmic surgeon a nightmare like post operative endophthalmitis. It is therefore important that we keep abreast of the scientific developments that allow us to understand and treat this sight threatening condition. It is at this moment that we must pay solemn tribute to the medical profession that openly discusses its failures and shortcomings in scientific forums and offers solutions through research and academic intercourse.

**Microbial spectrum:** A good microbiological facility is the corner stone of effective management of endophthalmitis. Samples are collected from suspected cases by an vitreous tap/AC tap or both. Amongst culture positive endophthalmitis, which accounts for 40-60% of such cases, there is an interesting variation, depending on region. Most standard texts list staphylococcus as the commonest agent. However this represents the trend in Europe and North America. In our country studies again show a different trend in the north and south of the country. In the south Das TP et al have shown that almost 50% of cases are due to gram negative cocci while Gupta Amod et al in the North have shown that fungus is the single largest causative agent 1,2 .The role of low pathogenicity organism like propionibacterium acnes and calcinobacter are increasingly implicated in delayed endophthalmitis 3,4.

**Infection or inflammation:** When a post op patient presents with a hypopyon on the first follow up visit , it is often difficult for the surgeon to decide how to treat this patient. A few clinical sign like significantly low vision, loss of fundus glow, lid edema and pain have all been variously described to predict infection 5. Needless to say a personal bias in decision making for one's own cases, out of wishful thinking is noteworthy. The most important policy here is that it is better to treat inflammation as an infection rather than infection as an inflammation.

**The EVS:** The endophthalmitis vitrectomy study (EVS) 1995 was a prospective randomized multi centre trial which had far reaching implications on our understanding of managing post cataract endophthalmitis 6. The take home message was ;If the patients vision on presentation was HM or better there was no difference in visual outcome from vitrectomy as compared to intravitreal antibiotic(vancomycin-Amikacin).However in eyes where only perception of light was present additionally performing a 3 port pars plana vitrectomy was significant: Vitrectomy tripled the frequency of achieving 20/40 or better visual acuity, approximately doubled the chance of achieving 20/100 acuity or better, and decreased by more than half the frequency of severe visual loss in this group. Notably the study concluded that systemic antibiotics did not alter the final visual outcome. This study was welcomed by the ophthalmic community, and its guidelines are still followed. For a change, it also pleased medical administrators across the USA because it cut massive expenses on intravenous medication and vitrectomy which could be between \$7.6 to 40 million annually 7.

**A Decade after the EVS:** Ten years are a long time in a clinical science. New developments have tried to address issues which the EVS left behind or overlooked. Intravitreal steroids were not used in the EVS but are now used along with the Intravitreal antibiotics in significant number of cases to curb the inflammatory response to infection. The EVS cocktail for intravitreal injection was vanco mycin with amikacin. Amikacin has largely been replaced by the safer and more effective Ceftaxidime. The role of systemic antibiotics in the management of Endophthalmitis is gaining ground with the introduction of newer antibiotics with good intraocular penetration even in the non inflamed eye. Gatifloxacin, is an extended spectrum fourth generation fluoroquinolone 8 .

Studies have shown that 2 tablets of 400mg, 12hrs apart before the surgery achieve a therapeutic concentration in the aqueous as well as vitreous even in non-inflamed eyes. Newer molecules like Imipenem group (for gram neg) and Voriconazole (non-candida fungi) are being tried. Intensive local treatment has a role, more so patients with corneal involvement or bleb infection. Newer antibiotics like moxifloxacin show aqueous and vitreous penetration on topical application with MIC above most common pathogens <sup>9</sup>.

**Survey of trends:** The ASRS (American Society of Retina Specialists) is the largest body of VR specialists with a membership of about 1600. In a preferences and trends survey the results of which have been just declared, some important information is available (Albeit mainly from North America)<sup>10</sup>.

56% of respondents took both AC/Vitreous samples during Tap, while 32% did only a vitreous tap. Vitreous samples were collected by tap done in the office with a fine needle in 46%; only 17% only opting for vitreous biopsy with vitrector, often described in books. Vancomycin with ceftazidime was the preferred intravitreal cocktail with an overwhelming 76% using it. Thanks to the results of the EVS, 52% do not use any systemic antibiotics, while 21% do. Interestingly 57% of respondents did use local steroids. Intravitreal steroids were used by 43%, systemic by 23% while 38% kept away from either. Also important is the information that 12% of the respondents had encountered at least one case of culture-positive endophthalmitis in their use of intravitreal steroids (IVI-TA) for diabetic macular edema.

**Good practice guidelines:** correct sterilization, OT asepsis and careful single use of fluids and viscoelastics are paramount to avoiding this complication. Air conditioning systems, ineffective autoclaves, contaminated water source for hand washing, multi-specialty OTs, and contaminated dilating drops have all taken their toll hopefully leaving us wiser. Much emphasis is laid on using aqueous Povidone Iodine 5% on the skin and in the conjunctival sac while preparing the patient <sup>11</sup>. Recent articles have highlighted the role of improperly cleaned hand pieces and tubing with deposits resulting in infection for which the term phacoendophthalmitis has been coined <sup>12</sup>. It is prudent to take a suture if a tunnel for phaco or SICS is too short, too wide or the edges have got frayed during manipulation, rather than leaving a leaking wound where ingress of fluid from the conjunctival sac is possible.

**Beyond medical management:** The management of endophthalmitis does not end by mastering the science. Compassion, care, and putting in your best effort go a long way in seeing that the patient does not choose legal recourse. Insensitive billing by large hospitals of such patients, because of clerical errors have resulted in the hospital and doctor being hauled over coals. Timely referral to vitreo-retinal colleagues and maintaining a transparent functioning, go a long way in salvaging the situation. Maintain records correctly and exhaustively, putting all documents related to the case in your personal charge.

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