Commentary: Usage of intravitreal steroids in endophthalmitis: Horns of a dilemma

The usage of steroids intravitreally along with antimicrobials for endophthalmitis management has been marred with controversy for decades. To a large extent, management of endophthalmitis has been based on physician discretion and has a lot of variability between cases. The rationale behind steroids/anti-inflammatory agents is that endophthalmitis leads to severe inflammation and bystander damage to intraocular tissues, especially the neurosensory retina, resulting in irreversible functional changes. Suppressing this inflammation may help reduce the irreversible damage and shorten the overall disease course. It is not well understood whether the damage to the visual function is due to the infectious agent or the immune response developed by the host in response to it.

There is no unanimous understanding regarding whether steroids have any definite role in visual improvement as demonstrated by this metanalysis, and previous reports as well.[1] The current article evaluated studies dealing with bacterial endophthalmitis alone. Considering fungal endophthalmitis, there is even lesser amount of evidence regarding the status of steroids, as steroids are believed to flare up intraocular pathogens. One way to approach this conundrum is to consider steroids once an initial dose of intravitreal antimicrobials has been given and/or vitrectomy has been done to reduce the microbial load. Then, if the patient is undergoing further intravitreal injections, intravitreal steroids can be considered.

However, steroids may have a definite role in preserving the anatomical integrity during initial endophthalmitis management, preventing outcomes such as phthisis bulbi or requirement of evisceration.[2] The inconsistencies in management rationale, type of outcomes reported, and follow-up protocols in previous studies make a uniform consensus difficult—more so because quantifying resolution or a successful management of endophthalmitis is not standardized. Steroids may reduce tissue inflammation in the initial period, which in turn can reduce the chances of eyes requiring further vitrectomies or IOL explantation procedures.

Another point to ponder is that the older evidence of intravitreal steroids is from days when an initial intravitreal regimen of antibiotics with or without steroids with additional injections would be considered followed by a period of observation. A decision of vitrectomy would be taken after noting the resolution pattern and based on physician discretion. However, with complete and early vitrectomy, as is becoming the norm gradually, after the organism load has been reduced, intravitreal steroids may also be considered in the retreatment regimens.[3] The biggest gray zone is for cases of fungal endophthalmitis, where no clear evidence is available due to extreme variability in clinical presentations. Authors have noted that visual outcomes may be better in fungal endophthalmitis with the usage of systemic or topical steroids under a cover of antifungal therapy.[4] However, the sensitivity of the fungi to the antifungal agent and the timing and dosage of steroids must be considered before starting the same.

Currently, although we have an armamentarium of drugs and surgical modalities, the outcomes of endophthalmitis remain poor because of unknown host and organism related factors, which cannot be treated using conventional methods. Experimental studies in animals have shown that infectious endophthalmitis can induce the expression of cytokines, chemokines, and apoptotic factors. Recently, authors have also studied inflammatory changes in the vitreous taken from endophthalmitis patients and tried to identify factors that can predict the clinical outcomes of the disease.[5-8] Apoptotic proteins such as Bax and Fas expression peaks at 48 h after initial endophthalmitis onset, and apoptotic rate peaks at 72 h under experimental conditions.[9]

Many such host innate immune pathways are under research to try and target for endophthalmitis management in addition to antimicrobials. Reducing the concentrations of individual inflammatory mediators might limit the bystander damage to tissues while allowing a more favorable wound healing response

along with neuroprotection. A TLR2 agonist, Pam3Cys, has been explored as a molecule which attenuates clinical inflammation, reduces bacterial load in retina, and preserves retinal architecture with electroretinogram in mice retina.[10] Anti-TNFα therapy may also have role in improving endophthalmitis outcomes.[11] Other possible drug targets in stage of development are anti IL6, anti IL1beta, anti IL8, etc., Scientists have also employed macrophage membrane-coated nanosponges as decoys to bind excess cytokines and chemokines in the vitreous to prevent cytotoxicity.[12] Further studies are needed to identify molecules that can help in reducing inflammation in severe and fulminating endophthalmitis cases and salvage such eyes toward both optimum anatomical and functional outcomes.

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