



Intra-Vitreal Antibiotics

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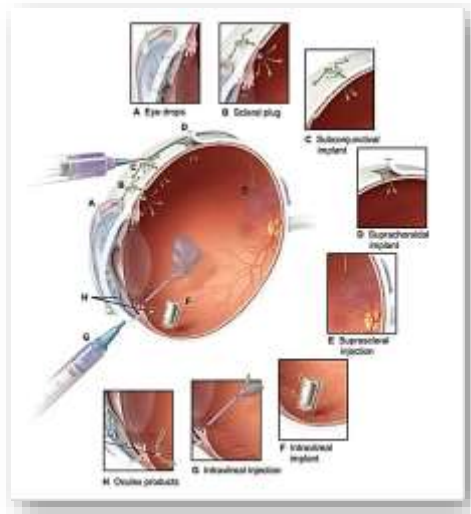
- Intravitreal antibiotics are the mainstay of treatment of endophthalmitis.
- The vitreous is a transparent gelatinous avascular body, rich in collagen and hyaluronic acid, which provides a good culture medium for the microorganisms to proliferate.

- Drug delivery into the posterior segment of the eye is complicated by several factors :
 1. The blood-ocular-barrier.
 2. The tear film causing dilution of topically insteled drug in the lacrimal flow.
 3. Low molecular weight antibiotics undergo systemic absorption via conjunctival capillaries and nasolacrimal mucosa.
 4. Tight corneal epithelium leading to poor paracellular penetration especially for ionic drugs.
 5. .

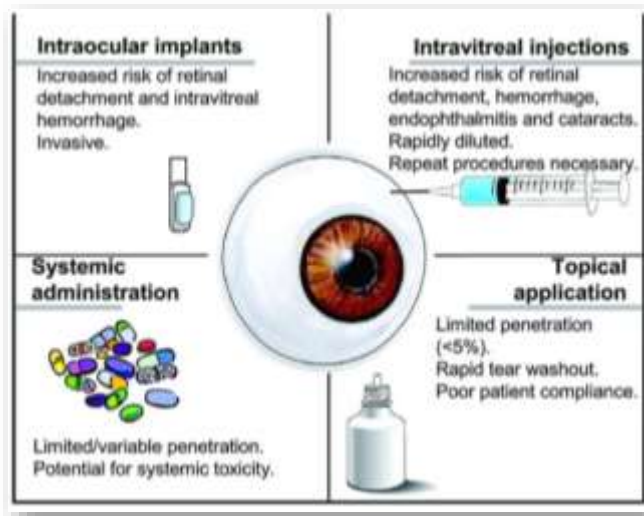
5- Even systemically administered drugs which gain access to choroidal extravascular space, distribution to intraocular space is limited by RPE an retinal endothelium.

Thus, direct intra-vitreous injection, bio-degradable and non-biodegradable sustained release system for injection (or) transplantations into the vitreous as well as drug loaded nano-particles, microspheres, and liposomes emerged

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Why Intra-Vitreous Antibiotics

- More popular clinical settings
- **Advantages:**
 - Direct applications of drug into posterior segment eliminating barriers
 - High doses can be reached to the target site without any alterations in the concentrations
 - Proven effective treatment

Intra-Vitreous Antibiotics

- **Indications**
 - Endophthalmitis
 - Early post-cataract surgery
 - Bleb-related infection
 - Post-traumatic endophthalmitis
 - others
 - CMV retinitis
 - Unresponsive infectious posterior Uveitis

Intra-Vitreal Antibiotics

- **Complications**
 - ✓ Sterile Endophthalmitis (0.16%)
 - ✓ Retinal detachment (0.15%)
 - ✓ Lens trauma (0.07%)
 - ✓ Intra-ocular hemorrhage
 - ✓ Angle closure
 - ✓ ↑IOP
 - ✓ Wound leak
 - ✓ Anaphylactic reaction

Intra-Vitreal Antibiotics preparation

Intravitreal antimicrobial agents	Dose	Preparation
Vancomycin hydrochloride	1 mg/0.1 ml	Available in powder (500 mg). Add 10 ml of water for injection to get 50 mg/ml. Draw 0.2 ml of constituent into tuberculin syringe and dilute to 1.0 ml. This gives 10 mg/ml and hence 1 mg/0.1 ml
Ceftazidime hydrochloride	2.25 mg/0.1 ml	Available as 500 mg powder. Reconstitute with 2 ml water for injection to a concentration of 250 mg (active ingredient 225 mg) per ml. Withdraw 0.1 ml into tuberculin syringe and dilute to 1 ml by adding 0.9 ml diluent. This gives concentration 22.5 mg/ml or 2.25 mg/0.1 ml
Cefazolin	2.25 mg/0.1 ml	Same as for ceftazidime hydrochloride
Amikacin sulfate	400 mcg/0.1 ml	Available as 100 mg in 2 ml vial. Withdraw 0.08 ml (4 mg) into tuberculin syringe and dilute to 1 ml to give concentration 4 mg/ml or 400 mcg/0.1 ml
Gentamicin sulfate	200 mcg/0.1 ml	Available as solution 80 mg/2 ml. Withdraw 0.1 ml (4 mg) into tuberculin syringe and dilute further with 1.9 ml of sterile water to give concentration of 4 mg/2 ml or 2 mg/ml (=200 mcg/0.1 ml)
Amphotericin-B	5 mcg/0.1 ml	Reconstitute 50 mg vial with 10 ml of 5% dextrose. Withdraw 0.1 ml (0.5 mg) of solution and increase dilution to 10 ml with 9.9 ml of 5% dextrose to achieve concentration of 500 mcg/10 ml or 5 mcg/0.1 ml

mg: Milligrams, ml: Milliliters, mcg: Micrograms

How to avoid complications if IVx

Anesthesia	The evidence supports the use lidocaine-based anesthesia (topical drops, gel, pledgets or sub-conjunctival injection), but there is a lack evidence supporting one technique over another.
Povidine-iodine Eye Prep	The literature shows strong evidence supporting PI prep applied directly to the corneal surface for at least 30 seconds prior to injection.
Peri-injection Topical Antibiotics	There is a preponderance of evidence suggesting cessation of routine peri-injection topical antibiotics, assuming proper PI prep.
Needle Gauge	The data shows significant advantages with 30-gauge or smaller needles and trends towards advantages with even smaller-gauge needles.
Needle Angle	There is significant evidence suggesting a tunneled or shallow angle of needle penetration will reduce reflux of drug or vitreous, maximizing actual delivered dose of medication and minimizing vitreous wicking.
Post-injection Intraocular Pressure	<ul style="list-style-type: none"> • It is not wise to withhold indicated intravitreal treatment due to a patient's existing glaucoma. • Tempering of post-injection IOP spikes, if desired, is best accomplished by consistent methods (AC tap, etc.) rather than relying on variable fluid reflux. • There is not sufficient evidence to recommend routine post-injection evaluation.

Thank you