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Practice Patterns In Glaucoma

Glaucoma practice often poses challenges and grey zones are frequently encountered by the general ophthalmologists. UP State Ophthalmic Society framed a panel of distinguished glaucoma experts across the nation and they were interviewed in order to have a prefeered practice pattern for glaucoma patients. The members of panel were:

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The questions were framed and the responses were compiled by

MK: Which is your preferred first line anti glaucoma drug and why?

PS: First line drug will be one of the prostaglandin analogues (e.g. Latanoprost or Bimatoprost). These drugs have an IOP lowering effect of 28–33%, require once a day dosing, and have limited local side effects. They are affordable, adherence and compliance are good.

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JB: My preferred first line AGM is Prostaglandin analogue if 30- 35% reduction is required to achieve target IOP. Even if a lesser reduction is needed, I prefer it over other AGMs in NTG & a higher DVT, to more optimally blunt out the peak IOPs, with its better 24 hr IOP control. Once a day dosage scheduling is convenient for the patient & ensures better compliance, with a minimum preservative associated damage. Along with other regular contraindications like a uveitic glaucoma / pre-existing CME etc., I avoid it in unilateral glaucoma for cosmetic purpose.

DT: Timolol if no systemic contraindication and no dry eye..... For economic consideration of the patient.

My first choice is Prostaglandin analogue.... if financially viable.

SP: I prefer PGA if not contraindicated, due to its 30-35% IOP lowering effect, one time dosing and now many have become preservative free, so ocular surface damage is also prevented. Plus many companies are now manufacturing it, so prices are competitive and the drops are more or less readily available in smaller cities / towns.

MK: What is your opinion on Rho kinase inhibitors? Where do you use them?

PS: Ripasudil is a rho kinase inhibitor used in ocular hypertension and open-angle glaucoma. It lowers IOP primarily by increasing outflow through TM in addition to decreasing both AH production and episcleral venous pressure.

I usually prescribe it as third or fourth drug in glaucoma.

JB: Netarsudil, a Rhokinase inhibitor has an IOP lowering efficacy less than PGA but is non inferior to Betablocker. I use it usually as a 3rd line AGM. Its major advantage lies in NTG (due to its ability to give a consistent 24 hr IOP reduction irrespective of baseline IOP & its potential to achieve IOPs to still further lower level by reducing EVP) & Steroid induced glaucoma (as it addresses Trabecular meshwork pathology which has been modified by steroids, by acting on & modifying actin cytoskeleton & extracellular matrix). I also use it in the perioperative period of

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Trabeculectomy to utilise its antifibrogenic function in the hope of getting a more functional bleb & is the drug of choice when IOP needs to be controlled by drugs in the perioperative period; & aqueous suppressants need to be avoided to get a better bleb , & PGAs need to be avoided for their pro- inflammatory action. I also add it in the schedule if a patient shows a prominent DVT, as studies have shown 24 hr IOP control& peak IOP blunting best with ROCK inhibitors among all AGMs, next only to a Trabeculectomy.

DT: I rarely use Rho Kinase Inhibitors.....i might use them as third or fourth drug in my prescription

SP: I use them when IOPs are not being controlled on the presently available drugs and have found them, especially Netarsudil – one time dosing at night, to bring IOP to acceptable limits. Patient counselling about congestion is a must but most patients tolerate night time dosing.

MK: In which cases do you use Pilocarpine?

PS: For ophthalmic dosage form (eye drops):

For chronic glaucoma:

Adults and children—Instill one drop 1 to 4 times a day.

For acute angle-closure glaucoma:

Adults and children—Instill one drop every 5 to 10 minutes for three to six doses. Then one drop every one to three hours until eye pressure is reduced

Instill 3-4 times every 10 minutes, before Laser PI.

JB: I use Pilocarpine only for miosis needed for a Yag PI, & hence continue it as an AGM only till the PI can be done in occludable angles with indication for PI. I don't use it after an LPI even if the IOP is not reduced after taking care of the pupillary block. Post PI management for angle closure disease is just like for a POAG.

DT: I use it in 1/4th of my practice.....excellent drug in primary glaucoma.

SP: I use Pilocarpine before YAG laser iridotomy, gonioplasty, in cases where IOP is not controlled with other medication. I try avoiding it in the young, in myopes, but it is very effective in POAG.

MK: What is the place for SLT in your practice?

PS: So far, I am not using SLT in my practice.

JB: I don't do SLT.

DT: I do LTP with 532 laser.....as supplement to 2 bottles.

SP: Since the equipment is not available with us, I am unable to use it.

MK: Do you prefer to do trabeculectomy and cataract surgery together or separately? Why?

PS: Management of coincident glaucoma and cataract needs customized solutions for each patient. When significant cataract is present, but IOP is well controlled, cataract surgery alone may be chosen. When glaucoma surgery is urgent and cataract is minimal, glaucoma surgery alone is indicated. If both conditions need early surgery, combined procedures should be considered.

Sometimes cataract is not causing vision problems, but the glaucoma needs to be treated. In these cases, it is best to do the glaucoma surgery and delay cataract surgery until later. In other cases, glaucoma is well-controlled without surgery, but cataracts are limiting vision. In these cases, cataract surgery alone can be taken up.

JB: Type of glaucoma helps plan a combined / separate approaches for managing a co- existing cataract & glaucoma. In secondary glaucomas, where, more often than not, a surgical intervention is a more definitive management required for IOP control, & the rate of cataract formation & progression is higher in an inflammatory situation, I prefer a combined surgery using MMC. In primary glaucomas with angle closure disease I do a combined Cataract & Glaucoma surgery when both need to be addressed immediately; for e.g. A mild to moderate glaucoma uncontrolled on more than 2 AGMs, with visually significant cataract. I prefer to remove an early cataract also, first, in an angle closure disease as a stand alone procedure, preferably with goniosyechiolysis, even when glaucoma is controlled with 2-3 AGMs , as I am expecting a better IOP control when lens related issues like pupillary block & a crowded anterior chamber with root of iris being pushed anteriorly causing irido-trabecular contact contributing to higher IOP have been addressed by lens removal, often resulting in a reduction in one drug post-op.. Also because , doing a phaco in a post- Trab eye may not only increase the failure rate of Trabeculectomy, but also because doing Phaco in a shallow anterior chamber(contributed by trabeculectomy itself & a higher lens vault & thickness) is much more difficult with compromised anterior chamber fluidics , & hence more chances of complications. I avoid a combined surgery whenever possible, in an advanced glaucoma especially with macular split, where reducing IOP with utmost safety profile is the urgent need, as almost all studies show higher rate of risk & complications & lower success rate with a combined surgery. In POAG I prefer to go for a combined procedure in a worsening glaucoma if target IOP is not achieved with 2 AGMs in a visually significant cataract , as adding a 3rd AGM often gives a suboptimal IOP reduction.

DT: I usually prefer combined surgery.... 2 sites 2 surgeons is my

preference.

SP: Where cataract is significant, patient affordability is questionable, patient has significant systemic comorbid conditions preventing repeated operations or stopping of blood thinners, patient comes from a great distance or has difficulty in repeatedly coming to the hospital-I would prefer to do a combined surgery.

MK: Do you use Neuroprotective agents? When?

PS: In ophthalmic formulation, brimonidine must reach effective pharmacologic concentrations in the vitreous to have an effect on the retina. In a clinical study of phakic, aphakic, and pseudophakic patients undergoing pars plana vitrectomy, topical brimonidine 0.2% administered twice daily for 5 to 14 days prior to surgery yielded 2 nM in the vitreous, satisfying the threshold concentration for neuroprotection .Various mechanisms for brimonidine's neuroprotective effects have been proposed including neurotrophic factor activation, vasomodulation, glutamate inhibition, and cell-survival signal upregulation as well as apoptosis downregulation.specifically, brimonidine increases the transcription of neurotrophic factors (e.g. brain-derived neurotrophic factor (BDNF) and fibroblast growth factor (FGF)) and their receptors (TrkB for BDNF and FGF receptor), which regulate various cellular functions including neuronal growth, plasticity, differentiation, and survival. Brimonidine has been shown to not only protect the retina from ischemic damage in a dose- and time-dependent manner, but also to support neural regeneration after injury. Brimonidine also mitigates neuronal death and promotes cell survival by decreasing (pro-apoptotic) while increasing Bcl-2/xL (anti-apoptotic) expressions in injured cells, respectively. Brimonidine further provides anti-cytotoxic benefits by decreasing post-injury glutamate accumulation.

JB: I choose AGM as first ,& subsequent add on , based on case to case requirement, depending on percentage IOP reduction required to achieve T-IOP, taking into account patient's systemic profile for contraindicated AGM , & not with a neuroprotective agenda, as most studies have shown a fledgling neuroprotection at best. I tend to give a trial of adding a CAI though, in a worsening glaucoma with a documented reduced ocular perfusion pressure, in a bid to improve ONH perfusion, before moving on to Trabeculectomy.

DT: I don't use them.

SP: I definitely use antioxidative agents in advanced glaucoma.

MK: What is your routine regime for visual field test and OCT in your practice?

PS: In my practice both optical coherence tomography (OCT) and visual field (VF) tests are used to monitor glaucoma progression, with one being objective and the other subjective…macular ganglion cell complex thickness can help monitor early to more advanced stages of glaucoma, as I used 10-2 and macular threshold to confirm it.

JB: I get fields done straight away when I see a significant ONH damage suggestive of glaucoma. In such cases which show a reproducible & clinically correlating field defect, I don't advice an OCT RNFL. In mild to moderate glaucoma well controlled on AGMs I advice field testing yearly in low risk, & 6 monthly in higher risk patients; & more frequently in more advanced glaucoma. In patients who appear to be progressing on MD & manual assessment, I counsel to convince them for 5-6 tests within a period of 2 years to get a quantitative corroboration of presence & rate of progression utilizing the event & trend analysis on GPA ; & upgrade management accordingly.

DT: I always get Fields done for my patients. I use OCT much less in my practice. In Glaucoma suspect it carries a role. I rely on disc photos more.

SP: In my opinion, Visual fields is a must for diagnosing glaucoma and for follow up, for determining the extent of functional loss, for explaining to the patient the extent of his disability and determining how much IOP reduction is mandatory.

OCT is done as a baseline for all, repeated once in two years or so in follow up of glaucoma patients and done in all cases where the patient is unable to do fields.

MK:-How to you approach a failing Bleb?

PS: Early signs of a failing filtering bleb-

1. Gradual IOP elevation during the first 2-4 weeks.

2. Excessive vascularization of the bleb.

3. Flattening of the bleb with the disappearance of microcysts in the bleb…

To determine if a bleb has failed, I first do gonioscopy to confirm a patent sclerectomy. Next I evaluate the bleb's function and remaining potential by applying pressure 180° away while observing through the slit lamp.

Early inflammation and hyperemia are best treated with the aggressive hourly use of prednisolone acetate eye drops and coadministration of sub-Tenon's 5-FU 50 mg/mL adjacent to or even 180° away from the bleb after the administration of a topical anaesthesia.

JB: In a failing bleb with rising IOP in early post- op period, I advice & demonstrate massage within a few days .If massage alone dosen't work & once the immediate post-op period is

settled, I do gonioscopy with due aseptic precautions & in a patent sclerostomy I do suture removal(releasable/laser suturolysis) . If trab is done with wound modulators, I do SR within 4-5 weeks, & earlier, if they have not been used. I defer massage after SR for at least a week in ACG. If iris incarceration is occluding sclerostomy a Yag laser shot at the iris can be given. If all these measures fail I go for bleb needling with MMC .15 ml of .02% , which can salvage a non functioning bleb with a patent sclerostomy months- years later as well. A Tenon's cyst might require needling if a conservative approach of aqueous suppressants doesn't work.

DT: My protocol is early intervention with Mitomycin C injections every 4-5 days. I go for Needling if no response to two such injections is there.

SP: my approach depends upon the time the bleb is found to be failing- suturolysis, internal and external bleb revision with addition of Subconjunctival Mitomycin C or application of Mitomycin on the bleb, subconjunctival Anti VEGFs.

MK: **What is the role of OCT in glaucoma in your practice?**

PS: It is well known that significant structural RNFL loss occurs prior to the development of functional visual field loss. In such preperimetric disease, OCT RNFL is especially useful in helping to diagnose glaucoma prior to the onset of visual field loss. 2. Certain extent to educate the patient.

JB: In glaucoma suspects I get a baseline OCT & HFA 24-2. If fields are normal I follow-up such patients on OCT RNFL to look for worsening, frequency of which is yearly in low risk profile suspects. In high risk profile suspects, especially with family history / high IOP/ high myopia, I prefer a quantitative objective analysis & counsel patients for 5-6 tests in a period of 2 years to utilize the GPA module for OCTRNFL for event & trend analysis. In a reasonably strong clinical suspect on the basis of a suspicious looking disc / +-OHT , I start treatment after discussing with the patient, if I see a GPA corroborated progression on OCT in a high risk profile patient , especially when 2/> RFs are present , even if fields are within normal range. I use OCT as a corroborative to clinical assessment only in glaucoma suspects/ pre-perimetric cases. During the course, once VFD start appearing, I follow them up only on fields.

DT: I have very less usage of OCT in my glaucoma patients.

SP: OCT is helpful especially where the patient is unable to do fields. Try to determine if structure and functional losses match in diagnosing cases. Do not give treatment if only OCT changes are present.

MK: **Which Tonometer do you trust the most and use most frequently NCT/ Applanation/ Rebound for your patients?**

PS: Whenever patient comes to my clinic, I usually take pressure by rebound tonometer as a screening tool. If it is in range of 15-21 mm Hg, nothing to do. Above it, will confirm with GAT (As gold Standard).

JB: I use rebound tonometer for screening. Any IOP on RT more than 21 mmHg is rechecked on AT followed by a CCT estimate. Glaucoma patients & suspects are followed on Applanation tonometer. I avoid NCT as reliability in higher IOPs is reduced.

DT: I prefer Applanation tonometry for all my patients.

SP: NCT is a screening method used for all patients but every glaucoma patient undergoes AT. Where AT is not possible Rebound tonometer is very useful and is being used regularly.

With these responses from distinguished panel we expect that the readers would develop a consensus and form a practice pattern that's guided by experts, is ethical and beneficial for the patients