

Systemic Drug-Induced Retinal Toxicity III

Drugs Causing Abnormalities in Color Vision and Electroretinography

- Phosphodiesterase 5 (PDE-5) inhibitors**
 - enzymes in phototransduction cascade
 - partially inhibit phosphodiesterase 6 (PDE-6)
 - transient blue tinting of vision
 - temporary abnormal ERG responses (including a delayed cone b-wave implicit time)
 - no permanent retinal toxic effects
 - in $\leq 50\%$ of patients ingesting doses >100 mg
- cardiac glycoside**
 - reversible yellow tinting of vision (xanthopsia)
 - digitalis**
- abnormal dark-adaptation curves and ERG responses**
 - poor night vision
 - more likely in patients undergoing repetitive therapy courses for acne
 - reversible
 - isotretinoin**
- antiepileptic drug**
 - depression of the 30-Hz cone amplitude
 - vigabatrin**

Miscellaneous

- sulfur-derived medications**
 - topiramate
 - acetazolamide
 - myopia
 - retinal and choroidal folds
 - macular edema
 - caused by isolated macular folds
 - caused by ciliochoroidal effusion, leading to angle-closure glaucoma
 - reversed with prompt discontinuation of the drug
 - for Mycobacterium avium-complex infection prophylaxis in HIV-positive patients
- vision loss**
 - severe
 - reversible
 - anterior & posterior uveitis
 - rifabutin**
- hypopyon**
 - reversible
 - hypopyon
 - stellate, refractile endothelial deposits
 - choroidal effusion
 - bupropion**
- overingestion**
 - erroneously claimed to have medicinal benefits
 - slate-gray or blue coloring of the skin
 - after colloidal silver ingestion over > 1 year
 - ocular pigmentation
 - silver**
- leopard spotting**
 - drusenlike deposition
 - brown-black granules diffusely deposited in Bruch membrane
 - dark choroid
 - ocular argyrosis
 - black tears

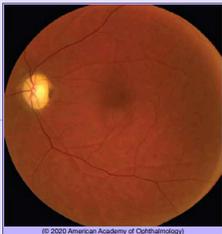
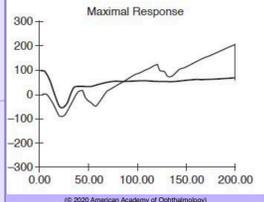
Drugs Causing Macular Edema

- microtubule inhibitors**
 - paclitaxel
 - docetaxel
 - drugs
 - taxanes**
- angiographically silent**
 - rare
 - cystoid macular edema (CME)
 - angiographically silent CME
 - full recovery follows discontinuation of the drug
 - nicotinic acid**
- oral hypoglycemics**
 - rosiglitazone
 - pioglitazone
 - drugs
 - glitazones**
- pulmonary edema**
 - severs fluid retention
 - development or exacerbation of macular edema
 - oral agent for relapsing multiple sclerosis
 - usually within 3 months
 - macular edema
 - Fingolimod**
- resolves with cessation**
- latanoprost**
- tafluprost**
 - drugs
 - Topical prostaglandin F2 α analogs**
- bimatoprost**
 - can cause macular edema
 - secondary macular edema caused by RPE toxicity
 - Deferoxamine**

Drugs Causing Occlusive Retinopathy or Microvasculopathy

- Interferon alfa-2a**
 - antiviral & immunomodulatory
 - treatment of viral hepatitis
 - paracentral visual field defects
 - cotton-wool spots and retinal hemorrhages
- Ergot alkaloids**
 - vasoconstrictors used to treat migraines
 - thrombotic complications (retinal vein and artery occlusions)
- oral contraceptives**
 - thrombotic complications (retinal vein and artery occlusions)
- Procainamide**
 - causes systemic lupus erythematosus
 - extensive "pruning" of second-order retinal vessels
- Gentamicin (& amikacin)**
 - intracocularly but not systemically
 - severe macular ischemia (infarction)
- hemorrhagic occlusive retinal vasculitis (HORV)**
 - intracameral
 - for prophylaxis of endophthalmitis
- Vancomycin**
 - widespread retinal vascular occlusion
 - antibody/antigen complex deposition
 - small vessel vasculitis

Drugs Causing Ganglion Cell & Optic Nerve Toxicity

- Quinine**
 - muscle relaxant for leg cramps and antimalarial
 - safe at doses < 2 g
 - dose
 - morbidity at doses > 4 g
 - mortality at doses > 8 g
 - acute severe vision loss
 - permanent
 - cherry-red spot
 - OCT ganglion cell layer thickening and hyperreflectivity
 - mimicks CRAO
 - early
 - diffuse inner-retinal atrophy
 - late
 - optic atrophy
 - retinal vascular attenuation
 - full-field ERG negative waveform signal **similar to CRAO**
 - retinal ganglion cell toxicity
 -  (© 2020 American Academy of Ophthalmology)
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- Methanol**
 - acute blindness
 - early
 - acute transient optic nerve head and macular edema
 - retina, RPE, and optic nerve demonstrate vacuolization **sign of cell death**
 - optic atrophy most common sequela
 - late
 - retinal vascular attenuation
 - diffuse ganglion cell loss
 - full-field ERG electronegative waveform