Overview of oral medications in eye care: the good and the bad

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No financial disclosures

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Plaquenil

Hydroxychloroquine

One of the most common reasons for routine ocular screening for adverse reaction

Used mostly for treatment of RA and Lupus, other emerging uses

About 150,000 people in the US

Chloroquine (Aralen)

Used as an antimalarial drug; very rarely for RA / Lupus

Much greater chance of ocular damage

Rare to be on long term therapy

3

Plaquenil

Dose is 200mg or 400mg daily. 400mg common

Prescribed in 200 mg tablets

Occasionally see 300 mg per day used (cut pills in half)

Increased risks of ocular damage include….

daily dose over 5.0 mg/kg/day using strictly actual weight (old standard for many years was 6.5 mg/kg/day using ideal body weight: may still be best for short, obese patients)

Renal dysfunction (50% decrease in GFR = 2X toxicity risk)

Other maculopathy

Tamoxifen use concurrently (5 X risk)

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Plaquenil

If patients are on 200mg / day ocular problems are very rare

At 400mg / day for extended periods of time the risk is much greater

Ocular damage and symptoms can progress after meds have been D/C

Damage can be irreversible

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Plaquenil

Affects the photoreceptors and then the RPE

Stores in Melanotic tissue, the liver, and the kidney

Excreted mostly by the kidney

Damage begins in a ring around the center of the fovea: often begins inferior-temporally first thus affecting the VF superior nasal to fixation first

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Chance for retinal toxicity

At doses below the 5.0 mg / kg / day threshold…….

Marmor and Melles 2014: study of 2361 patients with use over 5 years: 177 with toxicity (7.5%): all doses included

< 1% risk at 5 years

< 2% risk at 10 years

20% risk at 20 years

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Ocular side effects of Plaquenil

Bulls eye pigmentary maculopathy: late!

Visual field loss

Decreased vision and contrast sensitivity

Color vision changes

Vortex keratopathy (rare……more common with chloroquine)

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Plaquenil management

Testing should include……..

Baseline exam with fundus evaluation within one year of beginning medications

Management guidelines updated June 2016

Looking for pre-existing pathology

Supplementary diagnostic tests not needed at baseline visit

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Plaquenil managment

Then after five years of use……

Yearly exams with 10-2 VF (white on white) and SD-OCT

Also can consider FAF and multifocal ERG as extra testing

See more frequently and before five years if extensive risk factors present or dose above threshold

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VF defects with Plaquenil

HVF 10-2 white on white

Use pattern deviation plot

Look for paracentral ring scotoma or partial ring scotoma in area 2-6 degrees from center

Take any defect, even modest defects of 4-8 DB, seriously

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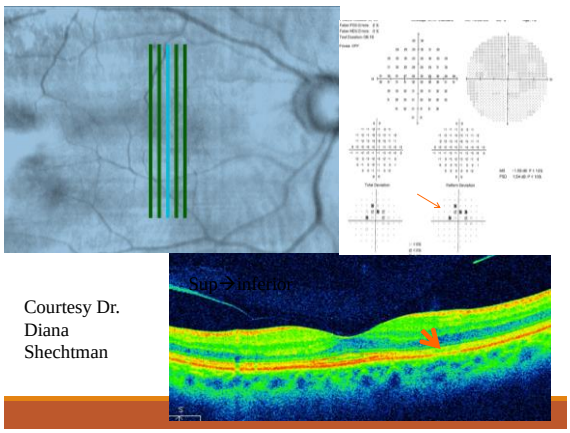

Courtesy Dr. Diana Shechtman

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Plaquenil management

Multifocal ERG (very sensitive, but extremely variable: should not be used alone),

SD-OCT (Flying Saucer sign), FAF.

Report to rheumatologist

Assess for dose toxicity at every visit

We have the ability to detect toxicity before vision loss occurs and before fundus changes are visible

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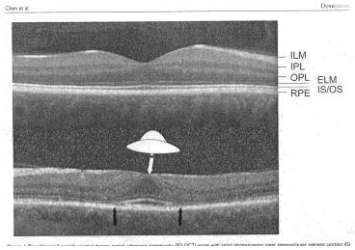
Chen et al. Clinical Ophthalmology 2010:4 p. 1151



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Plaquenil management

Study in Ophthalmology (January 2014 on-line) showed……..

Out of 150 individuals showing clear toxicity after cumulative dose of over 1000g……..

90% showed defects on both 10-2 VF and OCT

10% showed VF defect, but no OCT defect. Zero with OCT but no VF

2018 Study: *Br J Ophthalmol 2019: 0: 1-5*

Showed that the opposite can occur: 17 eyes found that had early OCT defects (attenuated PIL line or loss of parafoveal interdigitation zone) but no VF loss

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Late progression

Marmor and Hu JAMA online June 2014

11 patients with toxicity

Followed for three years after D/C Plaquenil

Categorized as mild / moderate / severe toxicity

Mild / moderate showed no progression after D/C

Severe progressed for up to three years

A second, 2018 study of 13 patients (some the same as above, some different) showed that some severe patients with RPE damage progressed for over 20 years!

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Late progression

Basically no progression of VA or VF loss

Significant progression in severe cases of SD-OCT and FAF damage

May be related to eventual death of already critically damaged RPE cells and foveal cones

Plaquenil found in blood in low amounts one year after D/C

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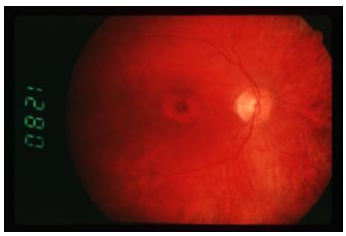
Bull's Eye Maculopathy



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Bull's Eye Maculopathy

5 cases of Bull's Eye Maculopathy reported with Sertraline (Zoloft)

An SSI used for depression

Very rare, but very significant

One case involved a 14 year old whose vision dropped to 20/200 in each eye after one year of use. Did not recover or improve after three years off of the drug

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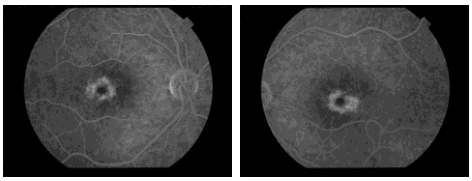
Bull's Eye IVFA



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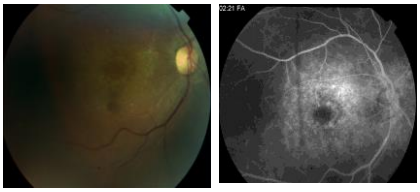
Chloroquine maculopathy



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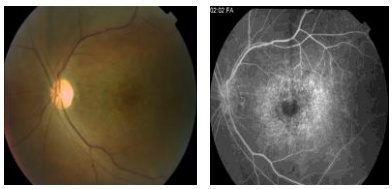
Chloroquine maculopathy



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Critical caveat

In Asian patients, damage tends to be paramacular and can extend out to the arcades

More diffuse maculopathy instead of a bullseye pattern

Must perform 24-2 or 30-2 VF instead of a 10-2 because damage tends to be further out

SD-OCT scans need to be performed outside of the fovea too

FAF a good choice

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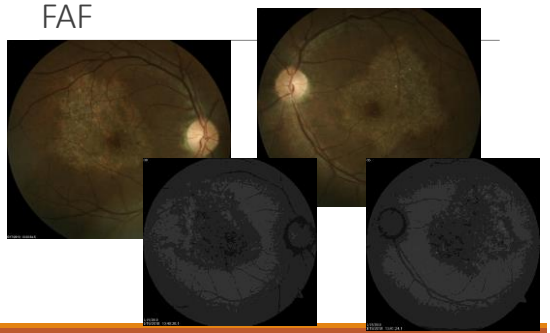
Chloroquine maculopathy & FAF



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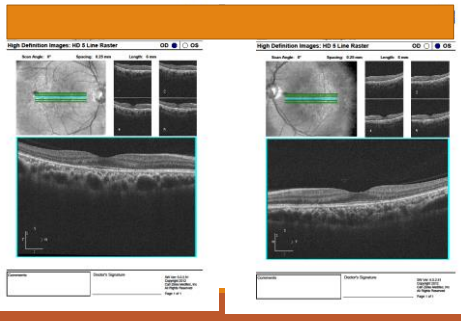
Chloroquine OCT



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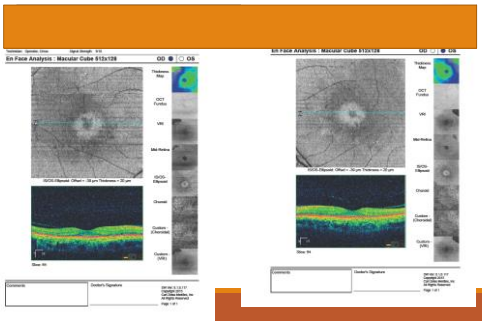
Chloroquine OCT En-face



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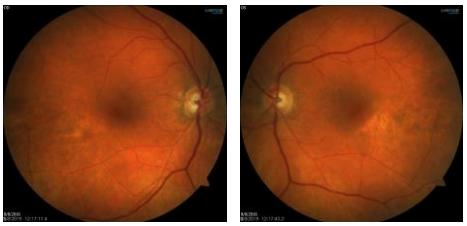
Plaquenil toxicity



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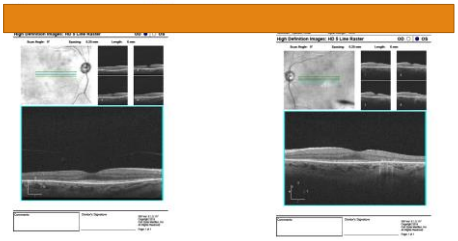
Plaquenil toxicity OCT



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Plaquenil Toxicity FAF

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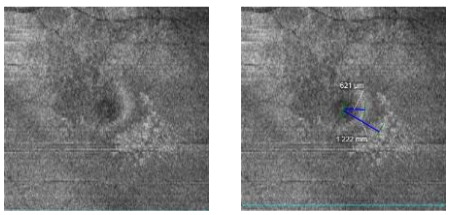
Plaquenil toxicity En Face OS



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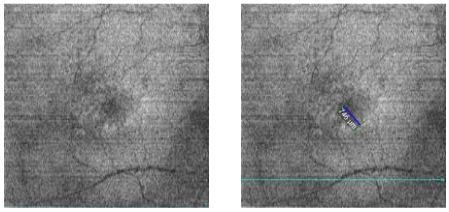
Plaquenil toxicity En Face OD



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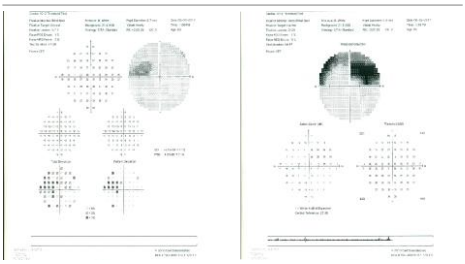
Plaquenil VF OU



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Elmiron (pentosan polysulfate sodium) : PPS

Newly discovered in 2019

Known as PPS

Treatment for bladder pain due to interstitial cystitis

After years of use, causes a maculopathy that mimics AMD or pattern dystrophy

Mild vision loss

Night vision difficulties

Mild changes seen on exam and fundus photos

Substantial RPE damage seen on FAF, best way to detect

Tends to progress significantly after discontinuation, even up to 10 years

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Other drugs causing pigmentary maculopathy

Clofazimine (Lamprene): also causes crystalline deposits in the cornea and conjunctiva. Used to treat leprosy and some skin conditions

Deferoxamine (Desferal): also causes cataracts and optic neuropathy. A chelating agent used to treat hemochromatosis

Indomethacin: NSAID. Can also cause vortex keratopathy

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Viagra / Levitra / Cialis

Phosphodiesterase 5 inhibitors

Prescribed for ED

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Viagra etc.

Works on PDE 5, but PDE 6 is found in the retina and the drugs have some effect on it (10 X more effect on PDE 5)

Changes in color perception are common, many colors possible

Increased light sensitivity, photopsia

Dose dependent: those taking 200mg of Viagra have 50% chance of ocular side effects; 50 mg <5 % (normal dose)

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Viagra / Cialis / Levitra and NAION

553 cases officially reported to the FDA by the end of 2014. 443 were Viagra

? Under reported

These medications also occasionally used for pulmonary HTN

Visual loss most often noted upon awakening the morning after use

Is the association real or coincidence?

Likely the "straw that broke the camel's back" in those with risk factors. But……..

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ED drugs and NAION

Very interestingly, has been reported in a 7 month-old infant, 28 year old, and 33 year old, presumably all taking them for pulmonary HTN

At those young ages, not as likely to have other NAION risk factors

2 reported cases of PION, one in a female with use for pulmonary HTN

38

Viagra / Cialis

What is the proposed mechanism? Nitrous oxide release actually dilates vessels…..but drops blood pressure.

Do ION patients have faulty autoregulation?

Ask all males with NAION about ED drug use. D/C if using to protect fellow eye.

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Voriconazole (Vfend)

Affects PDE 6 in the retina so has many of the same ocular side effects as Viagra etc. Antifungal drug

Color vision changes / photophobia / blurred vision 30 minutes after dose

No link to NAION

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Methotrexate

Chemotherapy / immune suppression for auto-immune disease

Not common to cause ocular side effects but can…….

CWS

Blurred vision, conjunctivitis

4 case reports of toxic optic neuropathy

Can decrease risk of toxic neuropathy with folic acid supplementation

41

Topamax (Topirimate)

Anticonvulsant used for migraines, epilepsy, depression, bipolar disease and weight loss

Carries FDA warning for ocular side effects

Multiple cases of bilateral, acute angle closure

Rare instances of uveitis with hypoyon

Five-fold risk of oral clefts in baby if taken in high doses while pregnant

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Topamax

Severe edema of the ciliary body leads to uveal effusion causing angle closure, excessive myopic shift

Occurs most often within 2 weeks

Can also cause VF defects without IOP increase

43

Topamax

Can happen with other sulfonamides but very rare.

Hydrochlorothiazide

Diamox

Sulfasalazine

One reported case with Wellbutrin, Tamiflu, Zonisamide, Duloxetine (Cymbalta)

3 cases of uveal effusion reported with immune checkpoint inhibitors for metastatic cancer treatment: Keytruda, Opdivo, Tecentriq, others

LPI typically not effective

Steroids and cycloplegics; discontinue medication

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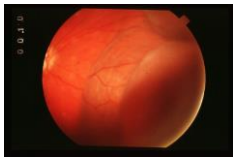
Topamax

Also reported with the supplement "Basic Detox Nutrients"

Methyl-Sulfonyl-Methane



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Topamax

Also causes a 10 micron increase in RNFL thickness on average with OCT

Can lead to myopic shifts as well, about -.50 on average. Up to -8.75 has been reported!

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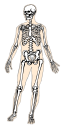
Fosamax

Biphosphonate

Used to treat osteoporosis, rarely Paget's disease and bone metastases



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Fosamax

Ocular side effects include.....

Scleritis!

Rarely.....

Iritis

Conjunctivitis

Ptosis

Yellow color disturbance

Diplopia

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Flomax

Prostate therapy (Alpha 1 blocker)

Also affects iris dilator muscle

IFIS (Intraoperative Floppy Iris Syndrome)

Leads to progressive miosis with floppy iris during intraocular surgery. Makes cataract surgery quite challenging!

Happens after about 2 weeks of use, then does not really get much worse after that and effect is essentially permanent

49

Flomax

Stopping the medicine before surgery does not appear to be effective

Occurs to a much lesser degree with Hytrin, Cardura, and Uroxatrol.

50

Comparison

Ophthalmology October 2013 E-pub

IFIS in Uroxatrol vs. Flomax

226 eyes: 70 Flomax, 43 Uroxatrol, 113 controls

Severe IFIS in…

34% of Flomax

16% of Uroxatrol

4% of control eyes

Can rarely be seen with antipsychotic medications too

51

Flomax

Evidence indicates that the effect can be significantly reduced during surgery with intracameral 10% phenylephrine

52

Rapaflo

Newer medication (silodosin) for BPH that is also highly selective for Alpha 1A receptors

Same risk for IFIS as Flomax

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Pegylated Interferons

Treatment used mainly for hepatitis.

Very long treatment course

Can cause retinal CWS and other vascular retinopathy / macular edema

Can be sight threatening but rarely is

Most common is CWS near the optic nerve

Plegridy: MS treatment every two weeks

54

Interferons

Inform prescribing physician

Endogenous interferon levels rise with cancer so……

Watch for isolated CWS with no explanation……think undiagnosed cancer! Also remember HIV and GCA, anemia, sarcoid, lupus

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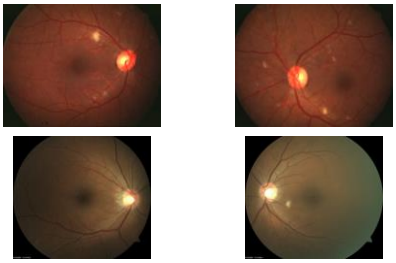
CWS secondary to interferons



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Amiodarone

Antiarrhythmic agent (K+ channel blocker)

Cardarone or Pacerone

Half life of up to 100 days!

Vortex keratopathy

Almost universal after six months or more of therapy

Does not typically have a major impact on vision but can

Can also cause downbeat vertical nystagmus

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Amiodarone

Resolves months after discontinued

Can also rarely affect color vision

Fabry's Disease (X-linked; lipid storage disorder caused by enzyme deficiency)

Limbal stem cell deficiency

What glaucoma drop can do this?

Rhopressa!

58

Amiodarone

Also causes bilateral optic nerve head edema in 2% of patients

Mimics NAION but occurs in both eyes

VA changes slowly recover and often return to baseline norms after discontinuing the drug but VF changes may not

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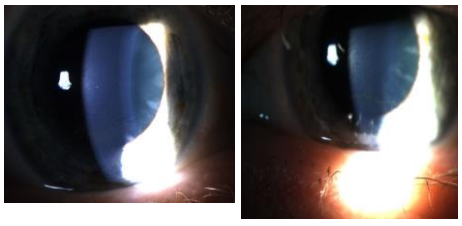
Amiodarone vortex keratopathy



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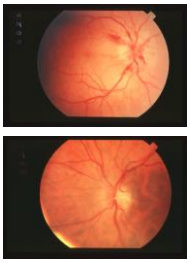
Amiodarone

Nerve swelling



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Tamoxifen (Nalvodex)

Antiestrogen therapy for the management of breast cancer

Similar in chemical structure to chloroquine: enhances chance of Plaquenil retinopathy

1-6% get ocular side effects

Causes a crystalline retinopathy

Pathognomonic foveal cystic spaces on OCT

62

Tamoxifen

Can cause……

Vortex keratopathy

Macular edema with decreased vision

Leads to decreased optic cup volume secondary to astrocyte swelling

Report to oncologist / physician

Monitor yearly

New evidence supports 10 years of therapy over 5 years, so more retinopathy in the future?

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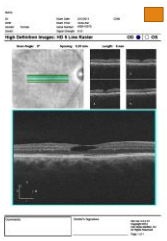
Tamoxifen retinopathy

Can also get from Methoxyflurane use

An inhaled anesthetic

64

OCT changes: mimics Mac Tel



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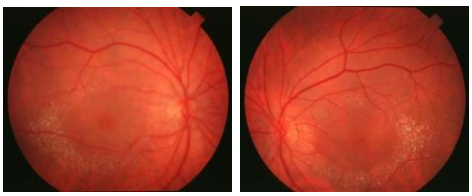
Canthaxanthine

TANNING AGENT



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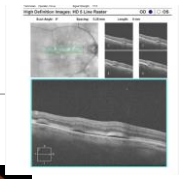
Balversa (Erdafitinib)



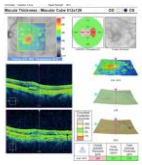
Oral chemotherapy agent for the treatment of urothelial cancer

Substantial risk of RPE detachments and neurosensory serous retinal detachments

Can affect vision if macula is involved

DFE every month for the first 4 months, then every 3 months thereafter

D/C med if substantial impact on vision



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Mitogen-activated Protein Kinase Inhibitors (MEK)

Used to treat metastatic melanoma

Cause a CSR like retinopathy with neurosensory detachments, and generally no PED's

Carmustine and Cisplatin are chemotherapeutic agents that interfere with DNA replication. Can cause cone dysfunction, dysphotopsia, hemorrhages, exudates, vasculitis, and pigmentary retinopathy

Immune checkpoint inhibitors and BRAF inhibitors: Treat cancer, cause uveitis

68

Phenothiazines

Phenothiazines –Chlorpromazine (Thorazine), Thioridazine (Mellaril)

Older antipsychotic agents

Decreased accommodation

Dry eye

ASC cataracts

Corneal endothelial pigment deposits

Macular pigment changes (mostly chlorpromazine)

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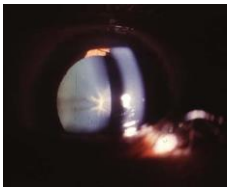
Phenothiazines

Macular pigment changes are sight threatening, cornea and lens changes have little impact on vision

Other more common meds like Prozac and Zoloft affect accom.



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Digoxin

Cardiac agent used for atrial fibulation / flutter and CHF

If doses exceed standard therapeutic levels, 95% of patients develop ocular complications

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Digoxin

The most common ocular side effect is color disturbance……often taking the form of a gold or yellow tinge to images

Haloes and other color changes are possible

72

Digoxin

Rare ocular side effects include……..

- Optic neuritis
- Loss of central vision
- Decreased acuity

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Dilantin (Phenytoin)

- Anticonvulsant
- Used to treat seizures / epilepsy
- Ocular side effects include blue-yellow color disturbance, nystagmus, diplopia, and rarely ophthalmoplegia
- Nystagmus and color disturbances are relatively common and are dose related

74

Dilantin

Report problems to the patient's neurologist

75

Potiga (Ezogabine)

- FDA warning issued 4-29-13
- Seizure medication, newer
- Blue coloring of the nails, skin, fingers, toes
- Blue coloration of the sclera and inside of eyelids, retinal coloration changes

76

Sabril (Vigabatrin)

- Epilepsy medication
- Not first line monotherapy except in infants
- VF constriction (diffuse) with predilection for nasal field
- Optic atrophy
- Takes months to years
- Occurs in roughly 1/3 of individuals
- Males to Females 2:1
- Not fully understood

77

Ethambutol

- TB treatment
- Can cause optic neuropathy with severe and lasting vision loss
- 1% chance
- In use since 1960
- Isononiazid now favored for treatment, but also linked to optic neuropathy
- Central or ceco-central VF loss but……
- Also has the ability to damage the chiasm and lead to bi-temporal VF loss

78

Isoretinoine (Accutane)

Used to treat Acne

Ocular side effects include……

Dry eyes / meibomian gland dysfunction: By far the most common.

Conjunctivitis

Decreased night vision

79

Accutane

Rare ocular side effects include corneal deposits, color vision disturbances, acute myopic shifts, and increased ICP leading to papilledema

80

Dupixent (Dupilumab)

Biologic for the treatment of atopic dermatitis

Subcutaneous injection

Targets Interleukin-4, blocking cytokeines that are needed to support T-cell function

Severely decreases the function of mucous producing goblet cells

Significant MGD and dry eye

81

Edema causing meds

Amantadine (Parkinson's / flu) : Corneal edema due to endothelial damage

Can start weeks to years after beginning

Can look much like Fuch's

Fingolimid (MS): Macular edema (13 of 2564 in trials, only 2 at proper dose). May also be linked to vein occlusions

Paclitaxel (cancer TX): macular edema and corneal LSCD changes

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Categories of oral drugs that OD's prescibe

I) ANTIBIOTICS

II) ANTIVIRALS

III) PAIN RELIEF

IV) STEROIDS

83

Oral Antibiotics: Ocular Indications

Beat the bugs!

Rosacea / Ocular Rosacea

Dacryoadenitis

Dacryocystitis

Preseptal Cellulitis

Hordeola / Chalazia

Blowout Fractures

84

Cost

$4 (30 day) and $10 (90 day) lists for generics at many pharmacies

Indicated by an *

85

Cephalexin *

250 (QID) or 500 mg (BID-TID)

Excellent broad-spectrum cephalosporin

Bactericidal

Cross sensitivity with penicillin regarding allergies but not with everyone, less common than you may think

Keflex brand is very expensive!

Substantial failure rate with facial cellulitis due to resistance

86

Dicloxacillin

Penicillinase resistant penicillin

Great for soft tissue infections

Bactericidal

Nausea, allergies, diarrhea

250 mg QID or 500 mg BID

Inexpensive

87

Augmentin

Amoxicillin plus clavulanate: 250 ,500 mg TID or 875mg BID

Works on bugs that are resistant to penicillin due to penicillinase

Bactericidal, good coverage, allergies

500mg available generically, but more expensive than dicloxacillin

88

Tetracycline*

250 or 500 mg QID

Bacteriostatic with much resistance

Poor for soft tissue disease

Can not be used in pregnant women or children due to effect on bone and enamel formation (discoloration of teeth)

Makes BC Pill less effective. Yeast infections.

Photosensitivity, stomach upset, calcium inactivation (take on empty stomach)

Great lipid / acid modulating effects

89

Doxycycline

50 or 100 mg BID at first

Periostat: 20mg (mostly dental use)

In tetracycline family

Can take with food

Less problems with photosensitivity

Still get stomach upset (don't lie flat for 30 minutes)

As effective as tetracycline but fewer side effects, better dosing.

Oracea (30 /10) $$$$$$$$$$$$ (very expensive)

Doxy used to be inexpensive, but no longer. Removed from $4 / $10 plans

Can also use minocycline

90

Minocycline

50 or 100 mg BID

Similar side effect profile to others, but also blue / black discoloration of skin, nails, and sclera with long term use.

Often used for acne

91

Azithromycin

Zithromax Z-pack: 6, 250 mg capsules. Is a macrolide. Moderate price but good for compliance

Take 500 mg (2) the first day and one 250 mg tablet each of the next 4 days

Can also take a single, 1000 mg dose (for ocular chlamydia for example)

May enhance the effect of oral anticoagulants

2 X risk of sudden cardiac death in heart patients

92

Azithromycin

Now has FDA warning for fatal arrhythmia

Greater risk if prolonged QT interval, bradycardia, hypomagnesia

Many experts calling for ban due to resistance concerns. Long half life and broad spectrum contribute majorly to overall resistance.

Can be as effective in treating rosacea / MGD / chalazia as the tetracycline / doxycycline family of drugs

93

Erythromycin*

Ery-tab sustained release tablets 250, 333, or 500 mg. Dose is 1000 mg (1 gram) per day so dose according to tablet

Can use safely when tetracycline family can not be used (children, etc.)

Bacteriostatic and terrible stomach upset

Does not have the lipid / acid modulating properties of the tetracyclines

Never really a first choice

94

Erythromycin

Increased risk of sudden cardiac death

Two-fold increase of very low risk when taken alone

Five-fold increase when taken with the following drugs…… Diltiazim, Fluconozole, Itraconozole, Ketaconozole, Verapamil

These drugs slow the breakdown of E-mycin resulting in increased concentration which in turn increases cellular sodium levels in resting heart muscle cells triggering an arrhythmia

95

Bactrim

Trimethoprim and Sulfamethoxazole: one tablet contains 80 mg T and 400 mg S (also available in double strength). One double-strength tablet Q12h

Can not use if patient has sulfa allergy

Good against MRSA and toxoplasmosis (Bactrim DS)

96

Ciprofloxacin*

Fluoroquinolone: 750 / 500 / 250 BID

5mg/100ml suspension

Effective but overused so resistance an issue. Lavaquin shows less resistance

Should not use in patients under 18 due to joint / tendon problems

Possible increased risk of RD has been refuted for the most part

FDA now says oral Fluoroquinolones should never be first line choice due to potential SE's

97

Oral Fluoroquinolones

Significant side effects……

Peripheral neuropathy

Tendon rupture

Heart arrhythmia

Dysglycemia in diabetics

Possibly GI perforation

98

Oral Antivira

Used to manage Herpes S
and Herpes Zoster

99

Oral Antivirals-Dosing Simplex

Acyclovir (200*,400,800) : 800mg TID or 400mg 5X day

Prophylactic dosing 400mg BID

Also available in a pediatric suspension

200 mg available on $4 / $10 plans, but only allocated one 200 mg tablet per day, so problematic

Famvir (125,250,500)

500mg TID

Valtrex (500,1000)

500 mg TID

Better bio-availability than Acyclovir

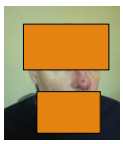
100

Oral Antivirals-Dosing Zoster

Acyclovir: 800mg 5X day for 10 days

Famvir: 500mg TID x 1week (may be antiviral of choice with zoster: can kill latent virus particles)

Valtrex: 1000 mg TID X 1 week



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Side Effects of Antivirals

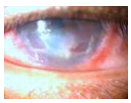
Very safe

Significant caution with renal impairment: only true contraindication other than allergy

Headache

GI upset / abdominal pain

Psychosis reported in elderly patients with poor kidney function



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H.E.D.S. (Herpetic eye disease study) - findings

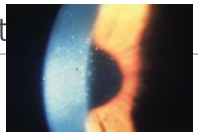
Prophylactic 400 mg of oral Acyclovir (Famvir / Valtrex not studied) twice per day for one year resulted in a 45% decrease in the rate of recurrence for all forms of ocular complications

Over the six months after discontinuation, there was no rebound increase but no continued benefit, so have to keep taking it

Interestingly, the benefit mostly applied to those with previous stromal disease, not previous dendrites alone in this study

103

MORE Recent



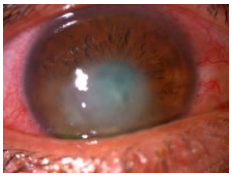
Olmstead County, Minnesota (394 patients)

Those NOT taking prophylactic antivirals were……

9.4 X more likely to have epithelial recurrence

8.4 X more likely to have stromal rec.

34.5 X more likely to have lid / conj. rec.



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Prophylaxis

So……

At least discuss prophylaxis for all patients with stromal disease and patients with multiple attacks of epithelial disease

Acyclovir 400mg PO BID or similar, like Valtrex 500mg daily

Very safe, caution in severe kidney disease, monitor creatine and BUN

105

Prophylaxis

However: Report in Journal of Infectious Disease 2013:208 (November) 1359-1365 and an editorial in the same issue……

Are we creating Acyclovir resistant strains of HSV with prophylactic use?

In cases using Acyclovir for ocular prophylaxis, 26% showed ACV resistance. So now we must consider this

106

Oral Pain medications

Manage underlying condition appropriately first from an ocular standpoint

Topical/ocular pain control……

Cycloplegia

NSAIDS

Steroids

Bandage CL

Topical anesthetic in office only

107

Pain Medications

If topical management is not enough, then consider oral pain relief

Laws vary for OD's regarding use of controlled substances

Two broad categories…

OTC pain relief, mostly NSAID's

Narcotic pain relief

108

Comparison of Analgesics

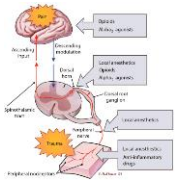

Image from cvm.msu.edu/.../Pain%20Management%20PDA.htm

109

NSAIDS

OTC NSAID's are often enough to mitigate ocular pain

Aspirin, Ibuprofen, APAP, naproxen

Common Trade names aspirin, Advil, Tylenol, Aleve

Aspirin 81mg, 325-500mg

Advil 200mg

Tylenol 325-500mg

Aleve 220mg

110

RX NSAIDS

Indomethacin (Indocin) 25, 50 mg

Naproxen (Anaprox) 275, 550 mg

Ibuprofen (Motrin) 200-800 mg

Indomethacin very good for scleritis. TID dosing

111

Common NSAID concerns

GI upset (take with food or drink, don't lie down for 30 minutes)

Bleeding

Ulcers

Caution also with renal disease, heart disease, liver disease (mostly APAP)

Rx strength particularly problematic with heart disease

112

Tramadol (ultram): used to be non-narcotic, but now a controlled substance

Immediate release (50-100 mg) and extended release (100-300 mg)versions

Maximum dose 300mg /day

Dose q 6-8 h

Schedule IV, so limited (but possible) abuse potential

113

Narcotic pain relief

As an OD, may or may not have authority to use (only Tramadol in Indiana for example)

Standard warnings…..no alcohol, don't operate machinery

114

Narcotic side effects

Constipation very common, and can be severe

Nausea and vomitting: often ceases after first few doses

Sedation

Lack of mental clarity

Respiratory depression (most severe)

115

Narcotic pain relief

DEA Scheduled substances

I-V

Schedule one has high abuse potential, schedule 5 very limited abuse potential

Two types of dependence….

Psychological and physical

Physical usually requires 2 weeks of therapy or more

116

Oxycodone

Schedule II :high abuse potential with severe dependence risk

Percocet: 5mg with 325 mg of APAP

Percodan:4.5mg with 325 of APAP

Tylox: 5mg with 500mg of APAP

117

Hydrocodone

Schedule II now

Lortab: 2.5,5,7.5 mg with 500mg APAP

Vicodin: 5mg with 500mg APAP

Vicodin ES: 7.5MG with 500mg APAP

Norco: 5,7.5,10 with 325 APAP

Zohydro ER: 10,15,20,30,40,50

118

Codeine

Schedule III

Tylenol with Codeine, all have 300mg of APAP

Tylenol #2 : 15mg

Tylenol #3 : 30mg

Tylenol # 4 : 60 mg

119

Oral Steroids

When oral steroids are used appropriately for a relatively short time they are very, very safe

After all, they are basically a natural substance already found in the body

Be aware of body weight when dosing

120

Who doesn't get orals, or gets them very, very carefully

Diabetics

Patients with stomach problems / ulcers

Patients with active infection

Pregnant women

121

What can they do that's bad?

Almost nothing in the short term! Most issues require long term use

Increase Na +, decreased K leading to fluid retention

Hypertension

Elevate blood glucose levels

Stomach pain and ulcers (stomach upset with short term use)

Insomnia, euphoria, psychosis (possible with short term use)

Thin skin / bruising

Osteoporosis

Increased ICP

PSC's (far more commonly than topicals)

Increased IOP (far less commonly than topicals)

122

What can they interact with?

Screw up glucose control

ASA, Coumadin

Digoxin

Some antibiotics, anti-seizure meds, anti-TB meds (TB itself is a strong relative contraindication)

123

What do they do that's good?

Duh!.....they decrease inflammation and therefore inflammatory sequelae

124

What can we use oral steroids for in eye care?

Contact dermatitis / allergic response of the eye lids

Reaction to insect bite or sting on the eye lids

Recalcitrant CME

Recalcitrant uveitis, especially bilateral or vitritis

Choroiditis / retinitis

Scleritis

125

Uses of orals in eye care

Myasthenia Gravis

Inflammatory orbital pseudotumor

Thyroid eye disease / Grave's ophthalmopathy

Optic neuritis (but not by themselves usually)

GCA

DLK post LASIK (in conjunction with topicals)

126

Ocular side effects of oral steroids

These are well known……PSC's and increased IOP

IOP increases are rare, but can occur with very long term use

PSC's are not rare!

10 mg per day or less for one year or less has almost no chance of PSC formation

16 mg per day or more over several years has a 75% chance of PSC formation

Overall, general population has a .5% chance of PSC development while those on long term oral steroids have a 30% prevalence (across doses)

127

Oral steroids

Oral steroids are generally prescribed in one of two ways……

1) Medrol dose pack (methylprednisolone)

2) Prednisone 10mg tablets

128

Comparisons

When it comes to suppressing the HPA (hypothalamic-pituitary-adrenal) axis……

25mg Cortisone = 20mg Hydrocortisone = 5mg Prednisone = 4mg Triamcinolone = 4mg Methylprednisone = .75mg Dexamethasone

Potency essentially follows this order but in reverse

Body produces an amount of cortisone that equals 5mg of prednisone per day

129

Medrol dose pack

Available in different strengths

Most commonly used is a package of 21, 4 mg tablets(2 mg is available)

Six are taken the first day, then one less each day thereafter (6-5-4-3-2-1 = 21 tablets)

Self tapering and little to no suppression of the HPA axis

In eye care, really only strong enough and long lasting enough for treatment of lid reactions

130

Prednisone*

Most common dosing is to give the desired amount in 10 mg tablets (need 40 mg, take 4 pills)

Is available in 1, 2.5, 5, 10, 20, and 50 mg tablets

Best choice for most of our desired uses in eye care

Potent and flexible

131

Dosing

Up to 60 mg, take entire dose in the morning

Over this amount take ½ in morning, ½ in evening

As previously mentioned, Medrol dose pack self tapers

With prednisone, after relatively short course at full desired strength, taper by ten milligrams every other day

132

Dosing

An alternative approach is to give twice the desired dose every other day then don't taper. Only for short term use, not long term

Theory is that anti-inflammatory properties remain high but suppression of HPA axis is much, much less

For long term use taper must be very slow

As OD's we rarely would be involved in the long term prescription of oral steroids

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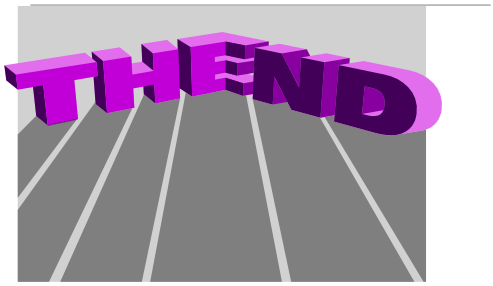

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