Current Management Options for AMD

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Age-related Macular Degeneration (AMD)

- AMD – acquired macular disorder

- Two types:
  - Atrophic (non-exudative)
    - Slow progressing, accounts for 90% of cases
  - Exudative
    - Less common but more devastating to visual function
    - Can occur alone or together with atrophic
    - Has 2 important features
      » Choroidal neovascularisation (CNV)
      » Detachment of the RPE

Kanski, J. Clinical Ophthalmology. 4th ed
Atrophic (non-exudative) AMD

Kanski, J. Clinical Ophthalmology. 4th ed
Exudative AMD

Kanski, J. Clinical Ophthalmology. 4th ed
Treatment before development of anti VEGF & PDT drugs

• Extrafoveal CNV
  – argon blue-green laser photocoagulation

• Subfoveal CNV
  – treated if small but with significant decrease in visual acuity

• Lesion is treated with overlapping burns, extending beyond the margins of the membrane.

• Reduced risk of severe vision loss by > 50%

• Severe vision loss is only postponed by about 18 months because of high recurrence rate of CNV.

Kanski, J. Clinical Ophthalmology. 4th ed
Currently available treatment options

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Visudyne: How does it work?

- Light activated drug
- Infused into the bloodstream 15 mins before treatment
- Activated using a non-thermal laser
- Targets new vessel growth
- Selective – does not attack structures around the neovascularisation
Visudyne: How does it work?

- Very popular before anti VEGF drugs
- Patients treated about every 6 months
- Results monitored with angiography at about 4 week intervals
- Mostly redundant now
- Some ophthalmologists still using Visudyne in combination with anti VEGF drugs
  - Further slows neovascularisation
  - Reduces number of anti VEGF treatments required
Visudyne: Side effects

- Blurred vision
- Photosensitivity
  - Patients advised to avoid exposure to sunlight and unscreened lighting for 48 hours post treatment
  - Some back pain during infusion (arthritis/Hx of back injury)
  - Pain stops when infusion is complete.
Visudyne: Success rates?

• Kolar, Vizdova & Vlkova (2006)
  » Decrease in VA post PDT from 6/30 → 6/60
  » Decrease in VA of < 3 lines = stabilisation of CNV

• Fenton & Perry (2006)
  » PDT reduces decrease in VA in patients with CNV

• Yang, Fan & Ho (2006)
  » 29% of patients = improvement in VA
  » Better VA results with Chinese patients compared with published Caucasian results
Visudyne: Cost?

• Initially $2,000 per treatment
• After 3rd treatment = free
• Now on PBS

• PBS requirements:
  » >= 50% classic sub-foveal CNV
  » Baseline VA >= 6/60
  » $30.95

(* $2,000 for patients who don’t fit PBS guidelines now)
Retaane: How does it work?

- Angiogenesis inhibitor
- Inhibits blood vessel growth by:
  - Decreasing extra-cellular protease expression
  - Restricting endothelial cell migration
- A blunt tipped, curved cannula is inserted under the conjunctiva, without piercing the eye
- Harder to inject & painful for the patients
Retaane: Side effects?

- Decreased vision
- Eye pain, redness, discomfort
- Eye swelling
- Cataract
- Decreased IOP
- Drooping of upper lid
- Abnormal pupil response / unequal pupils
- Eyelid swelling / redness
- Retinal detachment
- FB sensation

- Shivering
- Tiredness
- Headache
- Back pain
  - Nausea
- Nasal allergy
- Anaphylaxis
  - Dizziness
  - Swelling of extremities
Retaane: Success rates?

• Study 1:
  » After 1 year, 79% of patients treated maintained vision compared with 53% who received a sham

• Study 2:
  » After 1 year, visual outcome of patients treated was not statistically different to those that had Visudyne

• Retaane Clinical Trials (Alcon) Unpublished.
Retaane: Cost?

- On PBS

- PBS requirements:
  - >= 50% classic sub-foveal CNV
  - Baseline VA >= 6/60
  - $30.95

- If outside PBS requirement = $2,600*

* will depend on pharmacy
Avastin: How does it work?

- Monoclonal antibody against vascular endothelial growth factor (VEGF)
- Used for treatment of cancer, given intravenously (arm)
- Ophthalmologists started using it as an intravitreal agent to treat CNV
- Not approved by FDA or PBS
- Used off label (controversial)
Avastin: Side effects?

- Very few side effects seen
Avastin: Success rates?

• Mackiewicz et al (2007)
  » 56% of patient has improvement in VA (3 lines)
  » 28% no change in VA
  » 16% of patients had worse VA (1.5 lines)
  » Angiography = marked reduction in leakage from CNV

• Chen, Wong & Heriot (2007)
  » Pre injection: VA 6/24, OCT 251µ
  » 6/52 post: VA 6/19, OCT 214 µ
  » 10/52 post: VA 6/15, OCT 204 µ
  » 14/52 post: VA 6/15, OCT 210 µ
Avastin: Cost?

- One ampoule allows 24 syringes
- $58 per syringe
- Patients monitored on OCT 4-6 wks post injection
- If stable → wait another 3-4 wks
- If unstable → inject again

- Mostly used to treat CNV in diabetics or patients who don’t meet the PBS requirements for Lucentis
Lucentis: How does it work?

• Derivative of the same parent molecule as Avastin, but smaller
• Binds to & inhibits VEGF-A to control neovascularisation
• Developed for intraocular use
• Extensive clinical trials
• FDA approval
Lucentis: side effects?

- Redness around injection site
- Floaters
Lucentis: Success rates?

• Eye Surgery Associates preliminary clinical data
  » Baseline: VA 6/15, OCT 253 µ
  » 4/52 post: VA 6/9.6, OCT 177 µ
  » 8/52 post: VA 6/9.6, OCT 214 µ
  » 12/52 post: VA 6/9.6, OCT 184 µ
  » 14/52 post: VA 6/9.6, OCT 198 µ

• Patient is reviewed every 4-6 weeks, re-inject if unstable on OCT.

Data courtesy of Wilson Heriot & Danielle Thorburn
Lucentis: Cost?

• PBS requirements:
  » >= 50% classic sub-foveal CNV
  » Baseline VA >= 6/60
  » Confirmed with angio photos
  » $30.95 per injection

• If not eligible (non-classic sub-foveal CNV or diabetic) can either choose Avastin or Lucentis for $2,300 per injection
A lucentis success story

VA 6/18 injected 4-10-07

VA 6/12 1-11-07