EVIDENCE BASED TREATMENT OF AMBLYOPIA 2008

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Evidence Based Medicine
Prospective, randomised
- PEDIG, MOTAS & COCHRANE

Eminence Based Medicine
- Hopkins: weekend atropine
- Scott [Iowa]: only **full** time

PEDIG

- **P**
- **E**
- **D**iatric ophthalmology
- **I**nvestigator
- **G**roup

North American Community based
Ophthalmology and optometry

MOTAS

- **M**onitored
- **O**cclusion
- **T**reatment of
- **A**mblyopia
- **S**tudy

England Alistair Fielder

PEDIG: Amblyopia 6/30 - 6/120

6 h/d vs. all [or all -1] waking hours

- Ages 3-7
- Can do reliable HOTV
- 1h/d near activity

4mo: 4+ line improvement both groups

Age / severity of amblyopia NOT relevant to outcome!

PEDIG: Amblyopia 6/12- 6/24

2h vs. 6h/d opaque occluder

- Ages 3-7
- Can do reliable HOTV
- 1h/d near activity

4mo: same 2.4 line improvement

Age / severity of amblyopia NOT relevant to outcome!

PEDIG: Amblyopia 6/12 - 6/24

Daily atropine vs. patch 6h/d

- 6mo: no difference
- Patch: faster response
- 2y: amblyopic eye 1.8 lines worse in each group
- Improvement @ 2y: 3.6 vs. 3.7 lines

PEDIG: Recurrence of amblyopia after stopping treatment

≥ 3 lines acuity improvement

- **25%: ≥ 2 lines loss @ 12mo**
- 42% after stopping 6h/d
- 14% if 6h/d tapered to 2h/d before stopping

MOTAS investigators:
Recurrence of amblyopia after stopping treatment

Factors affecting the stability of visual function following cessation of occlusion therapy for amblyopia.

Graefe 6/2007

Tacagni DJ, … **Fielder AR**

MOTAS investigators:
Recurrence of amblyopia after stopping treatment

1 y follow-up from treatment cessation: **children with "mixed" amblyopia (both anisometropia and strabismus) had significantly (p=0.03) greater deterioration in VA** (0.11+/-0.11 log units) than children with only anisometropia (0.02+/-0.08 log units) or only strabismus (0.05+/-0.10 log units).

PEDIG:
Amblyopia 6/12 - 6/24

Daily vs. weekend atropine

- Same results
- Daily slightly easier to do
- 1/80: occlusion amblyopia

PEDIG:
Amblyopia 6/12 - 6/120 in 7-17yo

Glasses vs. glasses plus

- **7-12**: plus = patch 2-6h/d & daily atropine
- Acuity improves by ≥ 2 lines
- **13-17**: plus = patch 2-6h/d
- Some have improved acuity
- 12mo later: 20% have regressed

PEDIG: Glasses alone

6/12 to 6/75

- 27% cured
- Another 50% ≥ 2 lines better
- Took up to 7 mo

MOTAS GLASSES ALONE 'REFRACTIVE ADAPTATION'

- VA in 65 newly diagnosed children with difft causes of amblyopia at 6w intervals for 18w
- VA improved significantly (p,0.001) from 0.67 to 0.43 logMAR: a mean improvement of 0.24 independent of amblyopia type (p = 0.29) and age (p = 0.38)

Br J Ophthalmol 2004;88:1552-1556.

MOTAS REFRACTIVE ADAPTATION FOLLOWED BY OCCLUSION

- Prescribed dose 6h/d
- **Compliance <50% [2.8h].**
- Only 10% used it ≥ 5.5 h/d
- **0.1 [1 chart line] VA improvement per 120h of occlusion**

Total doses >200h:

- residual amblyopia <0.2 log
- >75% of deficit corrected

IOVS 2004

MOTAS REFRACTIVE ADAPTATION FOLLOWED BY OCCLUSION

% of amblyopia deficit corrected

Type	Ref. Adapt.	Occl.	Deficit corrected
All	32	47	78
Aniso	44	42	86
Strab	30	50	80
Mixed	27	50	77

MOTAS:
ELECTRONIC PATCH #1

- 18w of gls, then patch prescribed 6h c.f. 12h/d
- **6h/d**: received 4.2 [± 0.5] h/d
- **12h/d**: received 6.2 [± 1.1] h/d
- p=0.06
- <3h/d: worse outcome

MOTAS:
ELECTRONIC PATCH #2

- 6h/d prescribed
- Best acuity after 150 - 250 h

2 line gain:

- 4y: needs 170h
- 6y: needs 236h

ELECTRONIC PATCH #3

Graefe 3/2003 **Simonsz HJ et al**.

- Compliance : % of electronically registered time c.f. prescribed time.

Satisfactory acuity increase

- ratio between acuity of the amblyopic eye and acuity of the good eye > 0.75
- acuity of the amblyopic eye > 0.5 on E or Landolt-C, or
- 3 LogMAR lines of increase in acuity.

Results: Graefe 3/2003 **Simonsz HJ et al**.

Measured compliance

- ~ 80% in 8/14 children with satisfactory acuity increase
- 34% in 6 children with unsatisfactory acuity increase.
- Children with low acuity increase had statistically significantly lower compliance **p=0.038**
- 'no pain, no gain'

Cochrane Database Syst Rev. 2008 Apr

Interventions for strabismic amblyopia.

- Occlusion, whilst wearing necessary refractive correction… more effective than refractive correction alone in the treatment of strabismic amblyopia.
- Combining occlusion and refractive correction with near activities may be more effective than occlusion and refractive correction alone.
- No RCTs were found that assessed the role of either partial occlusion or optical penalisation for strabismic amblyopia.

The future

- ? Magic pill
- L-Dopa : > 15 years. Very promising but has minimal role.
- Europe: citicholine

- **The Antidepressant Fluoxetine Restores Plasticity in the Adult Visual Cortex**
- Jose Fernando Maya Vetencourt, *et al.*
- *Science 320,385 (2008)*

Prozac Makes Old Brain Cells Young

- **Research may explain antidepressants' effectiveness** *By Ed Edelson*

Posted 4/17/08 THURSDAY, April 17 (HealthDay News)

The antidepressant Prozac has been shown to restore old brain cells to their more plastic youthful condition in animal experiments... possible new explanation for the antidepressant activity of the medication ..... could be used to treat other conditions caused by malfunction of brain cells...

PEDIG
studies with completed enrolment

Enrollment Completed - Follow Up A

- Observational study of different types of esotropia
- RCT comparing near vs. distance activities while patching for amblyopia
- RCT comparing atropine vs atropine with reduced + for sound eye
- Atropine vs occlusion in 7-12 yr old
- NFL in amblyopia
- RCT of PALs vs single vision lenses on low myopia with large accommodative lags and near esophoria in children

Observation on therapeutic effect of auricular point sticking combined with Tongshiji treatment on child ametropic amblyopia

Zhongguo Zhen Jiu. 2008 Apr;28(4):270-2

- CONCLUSION: Auricular point sticking combined with Tongshiji treatment for child ametropic amblyopia …. convenient manipulation, obvious and rapid therapeutic effect.