Dyslexia: the role of the optometrist

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PLAN
INTRODUCTION
NON-CORRELATES
OPTOMETRIC CORRELATES
POSSIBLE CORRELATES
CONCLUSIONS

Literature review: selection criteria
- Correlates:
  - case control or (rarely) cohort studies that control for at least IQ
  - Interventions (treatments):
    - Double-masked randomized placebo-controlled trials
  - Published in inter-disciplinary peer-reviewed journals
- Disclosure:
  - i.O.O. Sales Ltd markets IFS orthoptic exercises, which the speaker designed, and for which he receives a small royalty

Role of visual factors in dyslexia
- Dyslexia is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling (Rose, 2009)
- Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory & verbal processing speed (Rose, 2009)
- Visual problems are not “the cause” of dyslexia
- Exceptionally, visual problems may contribute to reading difficulties
- In these cases visual treatments may help

Visual factors that do not correlate strongly with dyslexia
- Ocular pathology
- Visual acuity
- Refractive error
- Colour vision defects
- Strabismus

Optometric correlates of dyslexia

- Binocular instability
  - NB: other studies: Wahlberg-Ramsay et al. (2012), Creavin et al. (2015)
  - Prevalence: approx 15% in dyslexia; c.f., 5% good readers (Evans et al., 1994), but probably fewer than 15% need treatment (Evans, 2007)
  - Evidence indicates non-causal correlates
  - Evidence for treatment of binocular instability is likely to fall below standard required by Cochrane collaboration

Possible visual correlates of dyslexia

- Accommodative anomalies

- Saccadic eye movement dysfunction
  - Evidence for treatment of saccadic eye movement dysfunction is likely to fall below standard required by Cochrane collaboration

Visual stress (VS)

- Polarised views:
  - Zealots believe VS is a cause of dyslexia
  - Sceptics believe VS does not exist
  - Polarisation might be explained by VS existing on a continuum
  - In extreme cases VS contributes to reading difficulties, in others just an annoyance
  - Cortical hyperexcitability is most likely mechanism
  - Magno defect not correlated with VS
  - Prevalence: approx 20% of dyslexics
  - Evidence for treatment of visual stress is likely to fall below standard required by Cochrane collaboration

Promising results of treatment

- Evidence for treatment of visual stress with polarised lenses and glasses for VS

Additional resources

- Evans (1991)
- Allen Evans Wilkins (2010)
- Latest PubMed search 21-May-2016
**Pattern glare**

High prevalence in:
- Reading difficulties
- Migraine
- Photosensitive epilepsy
- Autism

DO NOT VIEW THIS IF YOU HAVE EPILEPSY OR MIGRAINE

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Handout from www.bruce-evans.co.uk

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**The lack of “Cochrane quality” evidence**

- Cochrane-type reviews classify as uncertain/limited:
  - Reading comprehension training for dyslexia
    - Galazka et al. (2014)
  - Surgical interventions for asymptomatic retinal breaks
    - Wilkinson (2012)
  - Collagen cross-linking for keratoconus
    - Sykakis et al. (2015)
  - Any treatment for chronic blepharitis
    - Lindsay et al. (2012)
  - Common treatments for hordeolum
    - Lindsey et al. (2013)
  - Treatment of intermittent exotropia
    - Hall & Gnanaraj (2013)
  - Treatments for exotropia
    - Elliott & Shafiq (2013)
  - Spectacle correction for preventing strabismus in hyperopic children
    - Jones-Jordan et al. (2014)

- What is evidence-based practice:
  "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research" (Sackett, 1996)

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**Conclusions**

- Certain visual problems are particularly common in people with reading difficulties
  - Binocular instability & visual stress
    - Unlikely to cause dyslexia
  - All these problems can cause similar symptoms
    - Eyestrain, headaches, visual perceptual distortions
  - People with reading difficulties or these symptoms should be referred to interested eye care practitioners (www.s4clp.org)

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**Free training in diagnosis of macular disease with OCT**

- Please visit poster by Paul Grace

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