ECOVSA WEBINAR 1, 2022 PRACTICAL PAEDIATRIC PRESCRIBING TIPS

5H0 520 50

TIM FRICKE, BHF/BHVI/UNSW/UniMelb

No relevant personal disclosures

BHVI holds patents in myopia control

Synopsis – interactive, reflective, connecting, contemporising

- When should we prescribe (and not prescribe) refractive corrections for children? (5 mins)
- Prescribing tips for paediatric hyperopia specifically (5 mins)
- When should, and how should, prism be prescribed? (5 mins)
- How should we communicate these ideas (and refractive error generally) with parents/carers? (5 mins)

WHEN TO PRESCRIBE REFRACTIVE CORRECTIONS?

- 1. Be as sure as you can of what you're dealing with
 - AutoRx, ret, subjective, blur function?
 - Cyclo vs non-cyclo?
- 2. Contextualize
 - Clarity, comfort, QoL, visual development (inc amb, strab, RE), general development, academic performance
- 3. Communicate
 - Listen (inc motivations, biases), understand (inc health literacy), express (center on patient)
- 4. Aim for shared decision making
 - Depth depends on family's health agency



Evidence examples supporting Rx accuracy (tip 1)

- What is my risk of mis-diagnosing pseudo-myopia as real myopia?
 - Kang et al (Br J Ophthalmol 2021) studied 2612 children aged 6yrs, 1984 children aged 13 yrs, in China
 - Myopia prevalence: 5% in 6yo's, 61% in 13yo's
 - Pseudo-myopia prevalence: 24% in 6yo's, 19% in 13 yo's
 - Average pseudo-myopic power: -1.13D in 6yo's, -0.38D in 13yo's
 - Only 4 out of 127 optometry practices used cycloplegia in Anyang, China
- Australian comparison:
 - Fotedar et al (Am J Oph 2007) tested 2,443 kids aged 6 and 12yrs in Sydney
 - Prevalence = 10% real myopia, 18% pseudo-myopia
 - Average pseudo-myopic power: -1.18D in 6yo's, -0.84D in 12yo's
- Extended optical fogging comparison:
 - Hopkins et al (Optom Vis Sci 2012) found retinoscopy averaged +0.2D, +0.3D and +0.5D at baseline, after 20 mins optical fog and cycloplegia respectively
- Blur Function

Evidence examples supporting contextualizing (tip 2)

- Clarity, comfort, QoL, visual development (inc amb, strab, RE), general development, academic performance
 - RE-QoL research is rare in children Esteso et al IOVS 2007
 - RE-vis devel research is common e.g. MOTAS (2004) & PEDIG (2006, 2007) proof that specs should be first tx of amb
 - RE-gen devel research is ... e.g. ADHD is independently associated with hyperopia (OR 1.3-2.2),and astigmatism (1.4-2.4) in Germany (Reimelt et al J Att Dis 2021)
 - RE-academics research is ... e.g. hyperopia & astig affect performance (Roch-Levecq et al JAMA Ophthal 2008), hyperopia affects reading (van Rijn et al OVS 2014), astig affects reading (Harvey et al OVS 2016), myopia affects performance (Ma et al JAMA Ophthal 2018)



PRESCRIBING TIPS FOR PAEDIATRIC HYPEROPIA?

- 1. Be as sure as you can of what you're dealing with
 - Ret, subjective, blur function, cyclo?
- 2. Contextualize
 - Clarity, comfort, QoL, visual development (inc amb, strab, RE), general development, academic performance

3. Communicate

- Listen (inc motivations, biases), understand (inc health literacy), express (center on patient)
- 4. Aim for shared decision making
 - Depth depends on family's health agency



Hyperopia tips (adapted from Ingram et al 1985, Ingram et al 1986, Lambert et al 2006)

- Err towards not correcting + in straight-eyed infants (more likely to interfere with emmetropisation than prevent strabismus)
 - At 3/12 old, 25% of kids have >+4.00DS. At 12/12 old, only 3% of kids have >+4.00DS
 - Correcting abnormal hyperopia at age 6/12 old does NOT change incidence of strab (about 24% of abnormal hyperopes)
 - Children with >+3.50DS at age 6/12 have a better chance of emmetropising to <+3.50DS by age 12/12 if they do NOT wear spectacles
- But be confident correcting + in
 - Infants with manifest strabismus (they don't emmetropise regardless)
 - And in any child with signif + older than 12/12 (45% of 12-month-olds with ≥+3.50DS develop strabismus)
- Correcting plus can improve academic performance (e.g. Roch-Levecq et al JAMA Oph 2008; Narayanasamy et al OVS 2015)
- Accept that the effect of hyperopic correction will vary b/t pts
 - Estimate via acc/verg skills





5H0 520 500





- Be aware of options
 - Relief, challenge, yoke
- Have a decision framework
 - Necessary measurements (assuming you have diff dx'd appropriately) = magnitude of deviation, verg ranges
 - Evidence-based selection process (Sheard?)
- Beware limitations
 - Large amounts are heavy and cause distortions and aberrations
- Beware adaptation
 - Best predicted via fixation disparity curve
 - Probably happens more in eso-deviations
 - May be predicted by 20 mins in trial frame?

Decision framework based on dev mag vs verg range

- Charles Sheard (Am J Optom 1930) collected and published data that suggested binocular fusion and comfort were better when:
 - BO reserve is $\geq 2x$ an exo-deviation

15pd int alt CI XT, BO range -/25/20



COMMUNICATION AND SHARED DECISION-MAKING

- Includes ideas from Perez and Hannan (MDLinx 2022) What to do when your patient doesn't trust you
 - Strong communication skills and free info exchange build Dr-Pt trust
 - Pt/family biases (inc racism, sexism, ageism) can challenge trust
 - "A good physician treats the disease and a great physician treats the patient who has the disease." William Osler (Canadian physician)
- Health literacy
- Healthy agency

How to build trust (Chandra et al, 2018)

- Personalize your communication to each patient
 - Listen and observe to understand the biases and filters
 - Explore the resulting information gap
- Communication tips for easing anxiety, conveying security, and building trust
 - Eye contact
 - Ask open-ended questions, listen, repeat back to show understanding
 - Light (appropriate) touch

Wrap-up

- Some brief thoughts on paed ref error, prism, and communication
- OBA suggests interacting, reflecting and connecting is useful for learning, contextualizing new evidence, contemporizing our practice
- Next, you have 20 mins to discuss issues raised by either Ann or I with random colleagues
- Then, return for some case discussions, and Q&A

References 1

- Chandra S, et al. Trust and communication in a doctor-patient relationship: A literature review. J Healthcare Comms 2018;03(03)
- Esteso P, et al. Correction of moderate myopia is associated with improvement in self-reported visual functioning among Mexican school-aged children. *Invest Ophthalmol Vis Sci* 2007;48(11):4949-54
- Fotedar R, et al. Necessity of cycloplegia for assessing refractive error in 12-year-old children: a population-based study. Am J Ophthalmol 2007;144(2):307-9
- Harvey EM, Miller JM, Twelker JD, Davis AL. Reading Fluency in School-Aged Children with Bilateral Astigmatism. Optom Vis Sci 2016;93(2):118-25
- Hopkins S, Sampson GP, Hendicott P, et al. Refraction in children: a comparison of two methods of accommodation control. *Optom Vis Sci* 2012;89(12):1734-9
- Ingram RM, et al. A first attempt to prevent amblyopia and squint by spectacle correction of abnormal refractions from age 1 year. *Br J Ophthalmol* 1985;69(11):851-3
- Ingram RM, et al. Prediction of amblyopia and squint by means of refraction at age 1 year. Br J Ophthalmol 1986;70(1):12-5
- Kang MT, Jan C, Li S, et al. Prevalence and risk factors of pseudomyopia in a Chinese children population: the Anyang Childhood Eye Study. Br J Ophthalmol 2021;105(9):1216-21
- Lambert SR, Lynn MJ. Longitudinal changes in the spherical equivalent refractive error of children with accommodative esotropia. Br J Ophthalmol 2006;90(3):357-61
 - Ma Y, Congdon N et al. Effect of a Local Vision Care Center on Eyeglasses Use and School Performance in Rural China: A Cluster Randomized Clinical Trial. *JAMA Ophthalmol* 2018;136(7):731-7

References 2

- MOTAS, Stewart CE, et al. Refractive adaptation in amblyopia: quantification of effect and implications for practice. Br J Ophthalmology 2004; 88: 1552-1556
- MOTAS, Stewart CE, et al. Amblyopia therapy: an update. Strabismus 2011; 19: 91-98
- Narayanasamy S, Vincent SJ, Sampson GP, Wood JM. Impact of simulated hyperopia on academic-related performance in children. Optom Vis Sci 2015;92(2):227-36
- PEDIG, Cotter SA, et al. Treatment of strabismic amblyopia with refractive correction. Am J Ophthalmol 2007; 143: 1060-1063.
- PEDIG, Cotter SA, et al. Treatment of anisometropic amblyopia in children with refractive correction. *Ophthalmol* 2006; 113: 895-903
- Reimelt C, Wolff N, Holling H, Mogwitz S, Ehrlich S, Roessner V. The Underestimated Role of Refractive Error (Hyperopia, Myopia, and Astigmatism) and Strabismus in Children With ADHD. J Atten Disord 2021;25(2):235-44
- Roch-Levecq A-C, Brody BL, Thomas RG, Brown SI. Ametropia, Preschoolers' Cognitive Abilities, and Effects of Spectacle Correction. *Arch Ophthalmol* 2008;126(2):252-8
- Sheard C. Zones of ocular comfort. *Am J Optom* 1930;7:9-25
- van Rijn LJ, et al. Spectacles may improve reading speed in children with hyperopia. Optom Vis Sci 2014;91(4):397-403