AMERICAN ACADEMY of OPTOMETRY

BV-14: Management of Accommodative Disorders

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Disclosure Statement

- Nothing to disclose

ACADEMY 2012 PHOENIX

Overview of Accommodative Disorders

- Prevalence
  - 6% of children ages 6-18 (Scheiman et al., 1996)
  - 17% of university students (Porcar & Nartinez-Palomera, 1997)

General symptoms common to accommodative disorders

- Problems are longstanding
- Intermittently blurred vision
- Eyestrain and/or headache with visual tasks
- Fatigue/sleepiness with visual tasks
- Loss of attention to task or comprehension over time

Accommodative insufficiency (AI) or ill-sustained accommodation

- Specific symptoms: blurred vision/eyestrain with NEAR visual tasks
- Examination findings
  - Reduced amplitude of accommodation
  - Higher than normal lag of accommodation
  - Difficulty clearing -2.00 D. lenses on monocular and binocular accommodative facility testing
  - PRA (positive relative accommodation) lower than -1.50

Conditions to rule out

- Medication side effects
- Ocular disease/trauma
- Systemic disease

Accommodative excess/spasm

- Specific symptoms: blurred vision at DISTANCE after performing near visual tasks
- Examination findings
  - Lead of accommodation
  - Difficulty clearing +2.00 D. lenses on monocular and binocular accommodative facility testing
  - NRA lower than +1.50
- Rule out: medication side effects and disease

Accommodative infacility

- Specific symptoms: blurred vision when CHANGING focus far → near and near → far
- Examination findings
  - Difficulty clearing both +2.00 and -2.00 D. lenses on monocular and binocular accommodative facility testing
  - PRA lower than -1.50 and NRA lower than +1.50
- Rule out: medication side effects and disease

Management of Accommodative Disorders

Accommodative insufficiency/ ill-sustained accommodation

- Prescribing added plus lenses for near work
  - Lenses can be used long-term or temporarily until vision therapy has been completed
  - Plus lenses for near can be prescribed for patients with reduced accommodation due to medication/ disease as long as those conditions are being addressed also

Accommodative insufficiency/ ill-sustained accommodation

- Methods for prescribing
  - Try to balance the NRA and PRA
    - e.g., NRA of +2.50 and PRA of -0.50 suggests an added lens power of +1.00)
  - Use an added lens power that produces a normal lag of accommodation on MEM retinoscopy (+0.25 to +0.75)
  - If patient has esophoria at near, attempt to eliminate it with added plus lenses

Accommodative insufficiency/ ill-sustained accommodation

- Vision therapy
  - Efficacy: The CITT clinical trial (Scheiman et al., 2010) found normalized amplitudes in 86% of children treated with office-based VT
  - VT is intended to improve accommodative amplitudes and to eliminate symptoms long-term
  - Expected treatment time: 8-12 weekly office visits plus 15-20 minutes/day home VT for isolated AI

Accommodative insufficiency/ ill-sustained accommodation

- Emphasis of VT - stimulating accommodation monocularly by:
  - Small print targets that are slowly moved CLOSER to the eye
  - Reading print through MINUS lenses (gradually increasing the power)

Conducting vision therapy

- General VT guidelines
  - Begin by emphasizing the direction of difficulty
  - Later address both accommodative stimulation and relaxation
  - Work on amplitude, then facility, then fine control
  - Attempt to equalize skills in both eyes
  - Teach patient the **feedback** from the VT:
    - Blur/clarity
    - Proprioception of **effort**
    - Observer can watch for appropriate pupil changes

Conducting vision therapy

- Work on 3-4 techniques in-office at each visit
- Teach 2-3 techniques for home (patient should work for 15-20 minutes/day total)
- Discontinue in-office VT when all goals have been met
- Taper the home VT gradually

Accommodative insufficiency/ ill-sustained accommodation

- Typical sequence of common techniques:
  - Monocular Hart chart push-up
  - Monocular lens flippers
  - Monocular minus lens rock
  - Monocular minus lens clear/blur/clear (for fine voluntary control)
  - Binocular lens flippers
  - Possibly vergence procedures

Accommodative excess

- Prescribing lenses
  - Distance lens prescription
  - Added plus lenses are **not** usually accepted for near work

Accommodative excess

- Vision therapy: preferred treatment
  - VT can be more difficult than for AI
  - High success rate for compliant patients
  - VT is intended to improve the speed and accuracy of relaxing accommodation and to eliminate symptoms long-term.
  - Expected treatment time is 12-15 weekly office visits plus 15-20 minutes/day home VT for isolated AE.

Accommodative excess

- Emphasis of VT – relaxing accommodation monocularly by:
  - Small print targets slowly moved AWAY from the eye
  - Reading print through PLUS lenses (gradually increasing the power)

Accommodative excess

- Typical sequence of common techniques:
  - Monocular Hart chart push-away
  - Monocular plus lens push-away
  - Monocular Hart chart distance/near rock
  - Monocular lens flippers
  - Monocular minus lens clear/blur/clear
  - Possibly vergence procedures (especially divergence to aid relaxation)
  - Binocular lens flippers

Accommodative infacility

- Prescribing lenses
  - Distance lens prescription
  - Added plus lenses may **not** be accepted for near work
  - If patient cannot perform VT, consider added plus lenses to reduce accommodative change from far to near

Accommodative infacility

- Vision therapy: preferred treatment
  - Approximate 86% success rate for compliant patients (Scheiman et al., 2010)
  - VT is intended to improve speed and accuracy of the accommodative response and to eliminate symptoms long-term
  - Expected treatment time is 8-12 weekly office visits plus 15-20 minutes/day home VT for isolated accommodative infacility

Accommodative infacility

- Emphasis of VT - stimulating/relaxing accommodation monocularly by:
  - Alternately focusing on small print targets at near and far (with the near target slowly moved closer to the eye).
  - Reading near print through alternating PLUS and MINUS lenses (gradually increasing the power)

Accommodative infacility

- Typical sequence of common techniques:
  - Monocular Hart chart distance/near rock
  - Monocular lens flippers
  - Monocular minus lens rock
  - Monocular minus lens clear/blur/clear
  - Possibly vergence procedures
  - Binocular lens flippers

Expectations of a completed vision therapy program

- Chief complaint and all related symptoms resolved
- Improved visual efficiency and comfort
- Exam findings normalized (for age)

Case example: History

- M.C., 16 y.o. female, 9th grader, good student
- Initial symptoms: watery eyes whenever reading, blur at near and far, diplopia when reading, headache every day (frontal & occipital, even on weekends, ibuprofen helps)
- All problems started at beginning of school year.
- Friends have to read assignments to her.
- General health: good except for allergies/ sinus condition

Case example: Objective data

- Unaided VA: 20/20 far, 20/30 near
- Emmetropia OU
- Normal pupils and motilities
  Cover test: ortho at far, 6Δ exophoria at near (comitant in left/right gazes)
- Stereopsis: 50", (+) random dot forms
- NPC: 22/29 cm to 38/40 cm

Case example: Objective data

- Accommodative amplitudes (push-up): varied from 3.5 to 8 D. OD/OS
- MEM (unaided): +1.00 D. OU
  - w/ +1.00 D. OU: MEM +0.25 D. OU, NPC 16/18
- Near vergences: BI x/12/10, BO x/8/4
- Facility (+/- 2.00) 9 cpm OD, 8 OS
- Ocular health: normal
- Humphrey central 24-2 field: full OU

Case example: Assessment/Plan

- Assessment:
  - Accommodative insufficiency
  - Convergence insufficiency
- Plan:
  - Prescribe +1.00 D. sph. OU for near only
  - BI prism was considered, but did not help fusion at near
  - Begin VT

Case example: VT Program/Outcome

- Did 2 months of VT for accommodation and vergence skills, made rapid progress.
- She spent 45-60 minutes/day on home VT!
- Results: All symptoms resolved, can read comfortably w/ Rx.

Case example: Progress Evaluation

- Unaided visual acuity 20/20 far and near
- Cover test: 4Δ exophoria at near
- NPC: 3.5/5.5 cm
- Amplitudes (push-up): 11 D OD/OS
- Near vergences: BI x/18/16, BO x/35/30
- Facility (+/- 2.00) 14 cpm OU
- Dismissed with maintenance VT for 2 more months

Thank you!

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