HOW TO REFRACT A CHILD?

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HOW TO REFRACT A CHILD?

- When to do cyclorefraction?
- What drops to use?
- Till which age?
- & how? Auto or manual?
- When to do trial? & how?
- Few tips in retinoscopy
When to do cyclorefraction in children?

- **Cases of strabismus:**
  - **ALL,**
  - at least in the first visit. (better yearly)
  - Should be repeated if
    - amblyopia not improved
    - Residual angle with glasses (going to surgery)
    - Better repeated annually

- **Children with suspicion of refractive error**
  - (Vision less than 6/6, symptoms as headache, asthenopia, etc):
    - Cycloref SHOULD be done (at least once)

- **Children with high variable dynamic refraction/ accommodation spasm**
  - (even in teenager)

- **Children with family history of refractive error:**
  - Cycloref to be done (at least once)

- **Children with no signs and symptoms:**
  - Better once at school entry

Cycloplegic drops?

- Which type? And what’s the regimen?
Role for Cyclopentolate for 3 days?..!

<table>
<thead>
<tr>
<th>TABLE 4-3. Cycloplegic/Mydriatic Agents in Children.</th>
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</thead>
<tbody>
<tr>
<td><strong>Agent</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Phenylephrine</td>
</tr>
<tr>
<td>Tropicamide</td>
</tr>
<tr>
<td>Cyclopentolate</td>
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<tr>
<td>Homatropine</td>
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<tr>
<td>Atropine</td>
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</tbody>
</table>

**Side effects**: Tachycardia, hypertension, psychosis, seizure, axia, flushing, tachycardia, fever, delirium

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Role for Cyclopentolate for 3 days?..!

* AAO

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<table>
<thead>
<tr>
<th>Table 6-2 Administration and Duration of Cycloplegics</th>
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<tr>
<td><strong>Medication</strong></td>
</tr>
<tr>
<td>Tropicamide</td>
</tr>
<tr>
<td>Cyclopentolate</td>
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<tr>
<td>Scopolamine</td>
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</tbody>
</table>

* Some physicians think that atropine ointment is a safer vehicle for delivery x 3 days.
Side effects

• Hallucinations
• Fever
• Blurring of vision esp near (school age) ?

Cycloplegics regimens:

• Cyclopentolate 1% 3 times with 10 min apart & see the patient in 45 min

• In infants <6 months:
  • Cyclo or Mydriacyl 0.5%
  • Apply punctal occlusion

• Combo drops
  • Cyclopentolate 1%
  • Tropicamide 1%
  • Phenylephrine 2.5%

• Atropine?

• Can be preceded the cycle drops with topical anesthesia:
  • Less stinging sensation
  • More ocular penetration
Comparative studies

   Cycloplegic refraction in esotropic children. Cyclopentolate versus atropine.

   [The cycloplegic effect of atropine in comparison with the cyclopentolate-tropicamide-phenylephrine combination].

   Atropine versus cyclopentolate plus tropicamide in esodeviations.

   The comparison of cyclopentolate and atropine in patients with refractive accommodative esotropia by means of retinoscopy, autorefractometry and biometric lens thickness.

   Comparison of atropine and tropicamide in esotropia.

   Comparative study on the safety and efficacy of different cycloplegic agents in children with darkly pigmented irides.

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**Comparative studies**

- **Cyclopentolate 1% versus atropine 1%**
  - **1981**
    - esotropic children younger than 5.5 years
    - (+0.34 diopters)
  - **1999 Turkey**
    - Statistically insignificant

To summarize these studies:

- In general: Most of the comparative studies show that:
  - Atropine refraction show more hyperopia than cyclopentolate by about 1 D
  - Specially in: Dark iris, esotropia and younger age (infants)
  - Yet Some studies showed insignificant differences
  - No significant differences in myopes
Personal recommendations for cycloplegics

- Children in general, with no strabismus, or with exotropia:
  - Cycloplegolate as a routine
    - (3 times 10 minutes apart) (the 3rd one Tropicamide)
    (avoid atropine side effects)

- Children with esotropia:
  - School age: Cycloplegolate
  - Preschool age: can be Atropine.
    - Esp: residual esotropia / Dark iris
    - Council the patient with possible side effects.
    - Can educate the parents to apply punctal occlusion.

Cycloplegic Refraction

- Auto-refraction as a routine.
- MANUAL refraction double check is a MUST.
• **MANUAL** refraction is a talent we should NOT lose...

• Approaching a child??

• Easy?
Don’t surrender...

• EUA for refraction is NOT routine....

• IT is an exception...
  • Play with child...
  • Start with manual refraction...
  • Think in EU Sleeping....
When to do trial (subjective refraction)?

- Co-operative children.
- Above school age
  - **BUT:**
  - Results should NOT be prescribed unless *compromised* with the following rules:
    1. Additional cyclorefraction should be done
       - (at least once in the records)
    2. Compared with the cyclorefraction
       - (no big difference)
    3. Compared with the current glasses
       - (avoid > 1D)
    4. Associated strabismus
       - (e.g. more plus in ET)

Duochrome test
Cycloplegic Refraction or Subjective refraction?

Ultrashort Rule:

AGE

1st 6 yrs
Birth-preschool

2nd 6 yrs
6 – 12 years

> 12 years

• Cycloplegia ONLY
  (No trial needed)

• Trial PLUS
  • Cycloplegia

• Trial ONLY
  (+/- cycloplegia
  when needed)

Tips for Retinoscopy
BEFORE drops...

• What to check before giving drops?:
  • Angle depth
  • Measure alignment
  • Check VA
  • Hx of drug allergy
  • Feverish

• Counseling:
  • Difficulty to read...& other side effects

• Media opacity (in relation to narrow pupil)
Tips for Retinoscopy

Possibilities of retinoscopy

No movement

- A: Emmetropia
- B: Myopia
- C: Hyperopia

Against movement

With movement
During Retinoscopy:

- CO-AXIAL.....
  - Fixates straight to the retinoscope

Autoref..
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THANK YOU