**VI° Congresso Nazionale Prisma**  
Firenze, Conferenza Florentia Hotel, Sub. 25 marzo 2017  
CORSO 2/A, h15:45 - 17:45  
**RIabilitazione del danno visivo da ischemia cerebrale**

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**Riabilitazione saccadica compensativa nei difetti omonim del CV**

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- Can people with HH learn to compensate for the lateral / central extent of the scotoma ?
- Exploratory saccade training based on visual feedback:
  - with a digital search task (Roth et al., 2009)

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**Campi di applicazione**

- Disabilità di orientamento spaziale causata da **difetti omonimi del campo visivo** (emanop sia, quadrantop sia) conseguenti a lesione cerebrale (ictus, trauma, tumore, ecc.).
- Tuttavia, il programma potrebbe essere adeguato anche per altre malattie:
  - e.g., hemineglect
  - retinite pigmentosa

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**Risultati**

- L’addestramento migliora la scansione esplorativa dello spazio visivo circostante e perciò l’abilità di orientamento attraverso movimenti oculi rapidi (saccadi), specialmente dal la **lato del campo visivo deficitario**.
- Questo contribuisce al miglioramento dell’autonomia e della qualità di vita dei pazienti.

Background Literature

- **Objective:** whether explorative saccade training (EST), compared with flicker-stimulation training (FT), would selectively improve saccadic behavior on the patients’ blind side and benefit performance on natural exploratory tasks.

- **Methods:** RCT. 6 wks training either with explorative saccade training through a digital-search task [VISIOcoach] or blind-hemifield stimulation by flickering letters


• Results, EST group, response time:
  - reduced in the digit-search task for the blind side
  - reduced in the natural search task on the blind side but not on the seeing side

• Results, EST group, fixations (gazes):
  - increased number during natural scene exploration toward the blind side and decreased on the seeing side
  - decreased stability and increased asymmetry of fixations toward the blind side.


• Results, both groups:
  - Reading speed (iReST): unchanged.
  - Visual field size: unchanged.


• Conclusions:
  - Explorative saccade training (EST) selectively improves saccadic behavior, natural search, and scene exploration on the blind side.
  - Flicker-stimulation training does not improve saccadic behavior or visual fields.


Selezione del paziente

- Difetto omonimo del campo visivo.
- Acuità visiva binoculare per vicino ≥0,4 (4/10, 20/50), sufficiente per leggere la comune dimensione di stampa del quotidiano.
Svolgimento del training

- Durata: sessioni di 30 minuti, 2 volte/giorno, 5 gg/settimana per 6 settimane.
- Ambiente silenzioso.
- Se necessario, indossare lenti correttive per vicino adeguate alla distanza di lavoro dal monitor (non lenti multifocali)
- Assicurarsi che il paziente non muova la testa, in modo che l’addestramento sia svolto solo mediante movimenti degli occhi.

Effetto del training nel tempo

- Lo studio scientifico ha mostrato che l’effetto del training persiste anche dopo la fine del periodo di addestramento di 6 settimane.
- L’addestramento può essere successivamente continuato a discrezione del paziente o dopo consulto con il terapista, eventualmente con una minore intensità.

Our experience

Pilot study to evaluate:
- Acceptance of the training in our setting
- Ability of the patients to do the training (unsupervised vs supervised)
- Reading performance (*)
- “Real-life” achievements

Participants

- 10 subjects (5M, 5F)
- Age: range 20-84; mean 43; median 41.5 y
- Condition:
  - Homonymous hemianopia: 7L, 3R
  - Duration > 1 yr
  - No hemineglect
Methods

- Binocular CDVA
- Binocular Pelli-Robson logCS
- Monocular microperimetry (MP1, MAIA)
- Explorative saccade training (VisioCoach)
- Qualitative assessment of eye movements by video-recording
- Table test (natural search task)
- Binocular reading performance (MN-READ-ita, SK-READ-ita, IReST text-ita)

Outcome measures

- Acceptance of the intervention in our setting ("real-world" environment):
  - VisioCoach at home
  - VisioCoach in the office

Results

- Acceptance of the intervention in our setting:
  - VisioCoach in the office: one session per week, for 8 weeks

![Bar chart showing VisioCoach performance over 8 weeks]

Outcome measures

- Ability to perform search saccades: qualitative assessment by video-recording of eye movements
  - unsupervised vs supervised training

VisioCoach saccade training

VisioCoach training video
Table test video

Results: Natural search & reach task

Reading with HH

- Results, both groups:
  - Reading speed (IReST): unchanged.
  - Visual field size: unchanged.


Reading with HH

Our experience:
Control group (reading):
- 55 subjects (29M, 26F)
- Tested for:
  - CDVA
  - MN Read-Ita
  - SK Read-Ita


Reading with HH

Control group, general features:
- Age:
  - range 46-89; mean 75; median 75 y
  + different from study group
- CDVA:
  - range 20/20-30; mean 20/24; median 20/25
  + not different from study group

*According to macular involvement (scotoma border → 2° fixation), 7/10 patients were selected*
Reading with HH

Results, study group: pre-post training
- **SIR Read**: no significant difference in numbers of paragraphs read, MRS, errors
- **IReST**: no significant difference in MRS


MN Read-ita

- Can we predict the HH scotoma side by looking at the errors on a reading chart?

Left HH

**SK READ- Ita**: Left side error pattern

Left HH, CDVA 20/50
Modified VisioCoach training video

Results

“Real-life” achievements (QoL):
3 patients who had ceased reading, started again
1 patient recovered an upright posture
1 patient found a job
1 patient started to travel by train
1 patient started to drive his tractor again

Explorative compensatory saccade training

Conclusions:
• Explorative compensatory saccade training (EST) selectively improves saccadic behavior, natural search, and scene exploration on the blind side (Roth, 2009).
• Explorative compensatory saccade training: no effect on both RS and errors, probably because:
  - trained saccade amplitude is wider
  - May need implementation?

GRAZIE
e buon lavoro!

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