Visual Rehabilitation Practices to Improve Visual Abilities in Adults Post-Stroke With Homonymous Hemianopia : A Rapid Review

OBJECTIVE

To summarize the effects of visual rehabilitation practices in adults post-stroke with homonymous hemianopia (HH).

HOMONYMOUS HEMIANOPIA: A CONDITION WITH MAJOR IMPACTS

Homonymous hemianopia (HH) affects up to 60% of stroke survivors and causes substantial difficulty with daily activities, greatly reducing their quality of life. As a result, visual rehabilitation is a key component of the treatment strategy for many individuals recovering from stroke.

VISUAL REHABILITATION IN ADULTS POST-STROKE WITH HH

Two main categories of visual therapies are generally suggested: 1) restitution therapies, which aim to reactivate the brain areas involved in visual processing through repeated stimulation, and 2) compensation therapies, which focus on teaching patients adaptive strategies to actively navigate their environment and compensate for their visual deficits.

However, the **effectiveness and safety** of these different types of therapies in adults post-stroke with HH **remain to be clarified**.

MANDATE

The visual impairment program team at CISSS[1] de Lanaudière (Quebec, Canada) regularly receives referrals from internal partners specializing in motor impairment and faces increasing demand from external partners, including optometrists and ophthalmologists. Concerned with providing evidence-based services, the team seeks information on the best practices in visual rehabilitation for post-stroke individuals with HH.

In this context, the Directorate of Programs for Intellectual Disability, Autism Spectrum Disorder, and Physical Disability (ID-ASD-PD) at CISSS de Lanaudière has tasked the Health Technology Assessment Unit (HTAU) of CIUSSS[2] du Centre-Sud-de-l'Île-de-Montréal (CCSMTL) with performing a rapid literature review on the subject.

PRECAUTIONS

A **rapid review** provides answers within a brief timeframe (six months). Achieving this requires compromises on the comprehensiveness of the research. As a result, some relevant studies may not have been identified.

[1] CISSS : Integrated Health and Social Services Centre
[2] CIUSSS : Integrated University Health and Social Services Centre

Québec

EFFECTIVENESS AND SAFETY OF THE INTERVENTIONS REVIEWED

Seven studies evaluating the effects of restitution therapies and eight focusing on compensation therapies have been reviewed. Most studies were conducted with individuals with chronic stroke aged 50 years or older.

Three techniques were evaluated for restitution therapies: discrimination training, stimulus detection, and audiovisual stimulation. Three interventions were also studied for compensation therapies: visual search, visual scanning, and personalized visual therapy.

The effectiveness of Restitution therapies

Visual abilities

Promising results for:

- Visual field (mean perimetric deviation and gain in decibels);
- Perceptual visual functions (motion discrimination and contrast sensitivity).

Non-conclusive results for:

- Equivalent cortical surface gain;
- Task performance;
- Reading speed;
- Light and object perception.

Other results

Non-conclusive results for:

- Quality of life;
- Neurophysiological parameters (thickness of the retinal fiber layer, ganglion cell layer and inner plexiform layer);
- Neuronal activity and brain structure.

The effectiveness of compensation therapies

Visual abilities

Promising results for:

- Reaction time in visual search tasks.

Non-conclusive results for:

- Visual sensitivity;
- Eye movements.

No effects on :

- Visual functions (visual acuity, contrast sensitivity, visual attention);
- Visual field borders;
- Reading speed and reading capacity.

Other results

Promising results for:

- Quality of life;
- Activities of daily living.

Non-conclusive results for:

- Visual scanning ability;
- Cognitive functions (risk perception, ability to divide attention and manage dual tasks);
- Physical, cognitive, emotional, behavioral, and social disability.

Interventions safety and side effects

Current evidence is too limited to assess the safety (i.e., potential side effects or complications) of the interventions reviewed.

WARNING: LIMITED GENERALIZABILITY OF RESULTS

- The results apply to a very targeted patient profile: primarily individuals in the chronic phase post-stroke aged 50 years and older.
- Many results are based on a limited number of studies (one to two studies).
- No studies examine the medium or long-term effects.
- Adverse effects are not formally studied.
- Several methodological limitations may have affected the quality of the results.

It is important to note that the reviewed data do not enable a comparison between restitution and compensation therapies, nor between the different practices within each category.

WHAT IS A RAPID REVIEW?

A rapid review is a transparent scientific approach used to synthesize knowledge from the existing literature. It aims to provide timely evidence by adapting certain methodological components of a traditional systematic review.

This work was conducted in accordance with emerging best-practice recommendations for rapid reviews, specifically those addressing the minimization of selection bias and the assessment of methodological quality among included studies.

METHODS

A literature search was conducted in three bibliographic databases (Medline, All EBM Reviews, Embase). Articles were selected according to pre-established criteria. The two main authors screened 20% of the publications in a blinded manner, while the first reviewer screened the remaining references. In total, 15 scientific studies were included.

Data extraction and methodological quality assessment were performed by the first author using a standardized tool.

PROJECT TEAM

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