Vision Therapy for Oculomotor Dysfunction or Vision Deficits Following Acquired Brain Injury

Cassidy Holland, SPT, LAT, ATC; Lisa Shirafuji, SPT; Kara N. Keegan, SPT; Sierra Muir, SPT; Kara G. Kalinski, SPT; Jeffrey Hoder PT, DPT

1Doctor of Physical Therapy Division, Duke University, Durham, NC

Background

• Visual impairments include vision, eye movement dysfunction, and visual perception
• Visual impairments occur in approximately 60% of stroke cases in the acute stage following stroke and 69% in traumatic brain injuries (TBI)

Purpose

• Examine literature on interventions used to treat oculomotor dysfunction and hemispatial neglect caused by acquired brain injury (ABI)
• Provide clinical recommendations to physical therapists (PTs) treating these populations
• Determine if oculomotor intervention improves functional ability in patients post ABI

Methods

Databases Reviewed

- PubMed
- Embase
- CINAHL Complete
- Scopus
- PsycINFO

Inclusion Criteria

- Subjects with oculomotor dysfunction or visual field neglect caused by ABI
- Oculomotor specific interventions

Exclusion Criteria

- Over 25% of study’s population age ≥ 18
- Non-English studies
- Case series and case reports
- History of previous ABI, oculomotor dysfunction, comorbid diagnosis of neurodegenerative conditions, tumors, or alexia/dyslexia
- Interventions that were exclusively pharmacological, substitutive, motor exercises, or higher-level visual skill interventions

Risk of Bias

- Modified Downs and Black Checklist

ICF Distribution

Results

Demographics

| Number of studies | 27 |
| Total participants | 1108 |
| Time since injury | 6 days to 20.17 years |
| Age range | 9.6 to 84 years |

Risk of Bias – Methodological Quality

| 0 Excellent |
| 4 Good |
| 16 Fair |
| 7 Poor |

Interventions

Outcomes

| Body Functions and Structures |
| Activities |
| Participation |

Conclusions

• Oculomotor interventions appear to have significant treatment effects following ABI
• Effects are seen across the ICF model and include improvements in activities of daily living, neglect, reading, mobility, and improving quality of life and functional capacity
• Most interventions were computer-based programs administered by vision specialists
• Access to current interventions is limited across rehabilitation specialists, including PTs
• Treatment effects lack generalizability due to small sample sizes and poor study designs
• Current evidence does not allow clinical recommendations to be made for practitioners other than vision specialists

Clinical Relevance

• Future research should focus on oculomotor interventions accessible to physical therapists for more complete clinical recommendations
• It may be beneficial for physical therapists to perform oculomotor interventions, as they typically encounter patients earlier in the treatment process

Acknowledgements / References

We would like to thank Leila Ledbetter, MLIS, for assisting us with our literary search.