



Title	Vision Problems Associated with Traumatic Brain Injury: A Systematic Review of Sequelae and Interventions for the Veteran Population
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Reference	VA Technology Assessment Program Briefing to the Consensus Validation Panel, May, 2009. www.va.gov/OPTOMETRY/docs/VISTBI-Vision-tbi-final-report-9-09.pdf

Aim

To systematically review: 1) the frequency of the most common visual sequelae associated with traumatic brain injury (TBI); and 2) the effectiveness of rehabilitation interventions for vision problems. (visual sequelae = oculomotor disorders and visual processing/perceptual disorders.)

Conclusions and results

Frequency of TBI-related vision problems: The searches identified 5118 citations. VATAP retrieved 302 articles, and 24 articles met the inclusion criteria. The most common sequelae for mild TBI were photosensitivity, blurred vision, and double vision. For patients with moderate to severe TBI, the most common problems were binocular dysfunction and spatial pursuit and/or saccade deficits. Moderate to severe TBI was also associated with attention deficits.

Effectiveness of rehabilitation for TBI-related vision problems: The searches identified 700 citations. VATAP retrieved 92 articles for further review. No articles for mild TBI met the inclusion criteria, but 3 were found for moderate to severe TBI. Due to small study size, the evidence was insufficient to draw firm conclusions.

Recommendations

Providers and veterans need greater awareness of TBI's consequences and treatments. Patients with moderate to severe TBI should understand the uncertainty regarding the benefits and harms of rehabilitation interventions tested thus far.

Methods

Articles from the VA's Journal of Rehabilitation Research and Development were searched, along with comprehensive literature searches for articles in English published between 1990 and 2009 in: PubMed, Cochrane Library, MEDLINE®, EMBASE®, and Current Contents via Dialog OneSearch®. Subcategories of the following search terms were also used for specific searches of frequency of TBI-related vision problems: "brain injury",

"study types", and "sequelae"; and Effectiveness of rehabilitation for TBI-related vision problems: "brain injury", "visual sequelae", "treatment", and "adult". Explicit inclusion criteria were applied.

Further research/reviews required

Frequency of TBI-related vision problems: 1) post-injury follow-up studies after longer periods, along with better reporting of criteria, context, heterogeneity, and method; 2) studies to refine existing and novel commercial programs and computerized testing tools to understand the neural sites involved in impairments detected by these tests; 3) studies to understand how vision problems affect functional impairment, depression, and premorbid IQ, and how age and education influence testing; 4) larger studies to identify improved TBI detection methods using oculo-motor and perceptual testing; and 5) confirm findings that suggest TBI patients with normal, corrected visual acuity and visual fields can still suffer from significant visual perceptual problems.

Effectiveness of rehabilitation of TBI-related vision problems: 1) address mild TBI patients; 2) identify valid relationships between rehabilitation and patient outcomes; 3) examine outcomes after acute rehabilitation; 4) increase reporting about cognitive rehabilitation for TBI patients; 5) determine optimal cost-effective rehabilitation; and, 6) basic neuroscience research.