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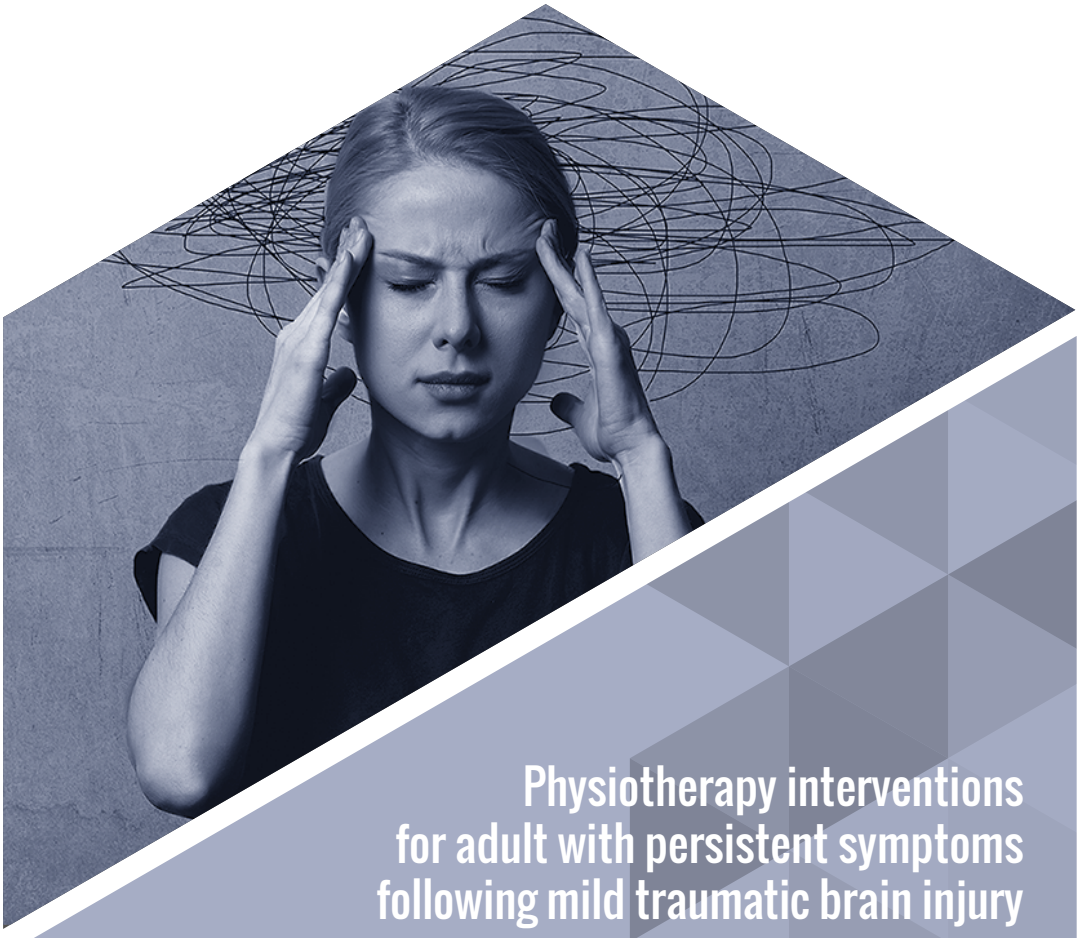

Physiotherapy interventions for adult with persistent symptoms following mild traumatic brain injury

EXECUTIVE SUMMARY

of the abridged ETMI report

Québec

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ISSUE

Mild traumatic brain injury is an invisible injury caused by a rapid back-and-forth movement of the head that causes the brain to strike the walls of the cranium. This injury may result from a traumatic incident caused by a direct impact to the head or any other part of the body that transmits impulsive force to the head. According to the literature, between 34% and 44% of patients with mild traumatic brain injury have persistent symptoms three to six months after the injury. These symptoms can last up to 12 months in 5% to 20% of patients. Dizziness is one of the most frequently reported symptoms following mild traumatic brain injury, and can be disabling several months after the traumatic event. Guidelines and recommendations for the management of mild traumatic brain injury are available in the literature. However, the literature remains limited with regard to interventions aimed at the management of persistent dizziness beyond three months after mild traumatic brain injury.

CONTEXT

As part of the implementation of the regional service organization program for victims of mild traumatic brain injury, a service offering targeting CIUSSS de la Capitale-Nationale emergency room staff was initiated in December 2017. The aim of this program was to contribute to the reduction of incapacity and disability by identifying and implementing effective interventions for patients at risk of persistent functional complications. In order to improve the physiotherapy care offered as part of specialized rehabilitation services, the Direction DI-TSA-DP of CIUSSS de la Capitale-Nationale, specifically the Traumatic Brain Injury Program, asked the Unité d'évaluation des technologies et modes d'intervention en santé et services sociaux (UETMISSS) to support them in making decisions regarding the identification of effective physiotherapy interventions to be implemented for the treatment of patients with persistent symptoms following mild traumatic brain injury, more specifically those presenting with dizziness without vestibular cause.

OBJECTIVE

The aim of this project was to identify physiotherapy interventions (practices, approaches) for the treatment of adults with symptoms persisting beyond three months following mild traumatic brain injury, especially dizziness without vestibular cause. To achieve this objective, the following evaluation questions were formulated:

- What physiotherapy interventions treat persistent symptoms after mild traumatic brain injury?
- Are efficient physiotherapy interventions for the treatment of persistent symptoms after mild traumatic brain injury safe?

For further information, see the report at:
https://www.ciusss-capitalenationale.gouv.qc.ca/sites/d8/files/docs/MissionUniversitaire/ETMISSS/Rapport-ETMI-abr%C3%A9gee_Interventions-physiotherapie-adultes-symptomes-persistants-traumatisme-craniocerebral-leger.pdf

METHODOLOGY

A systematic review of the literature was carried out. A search strategy was defined in collaboration with a librarian to query the bibliographic databases *Medline (Ovid)*, *Embase (Ovid)* and *CINHAL (EBSCO)*. A search of the grey literature was also carried out. The relevant studies published from January 2000 to April 2024 were selected from the PICOTS typology (Samson & Schoelles, 2012). Two professionals split up the tasks after making sure they had a common understanding of the selection and quality assessment criteria. Data extracted using a structured grid were synthesized and analyzed based on the assessment questions.

RESULTS

The literature search identified 8 279 documents, including 4 354 from the bibliographic databases and 3 925 documents from the grey literature. At the end of the selection process, 15 documents were selected, including 12 primary studies and three documents from the grey literature. The 15 selected documents were published between 2009 and 2023. Most of this documentation comes from Canada (6) and the United States (5). Of the 12 studies included, two were systematic reviews of practice guidelines, eight were quantitative primary studies and the last two used a mixed design. Regarding methodological quality, five studies were of high quality, and five others were of good quality, Two of the three grey literature documents have high credibility, and the other one has moderate credibility.

a) Efficient interventions for the treatment of symptoms persisting beyond three months

- Group vestibular rehabilitation (Kleffelgaard et al., 2016; 2019) or combined with other therapy (Adams & Moore, 2017) reduced disability due to dizziness. This is an indirect measure that suggests an impact on dizziness.
- Vestibular rehabilitation is also recommended in the two systematic reviews (Marshal *et al.*, 2012; 2015) as well as the three grey literature documents retrieved (Department of Veterans Affairs, 2009; Ontario Neutraumatology Foundation, 2018; Physiotherapy Alberta College Association-PACA, 2019).
- The effectiveness of aerobic exercise on persistent symptoms, including dizziness, has been reported in one study (Christensen *et al.*, 2020) and in the PACA guidelines (2019).

b) Intervention safety

The safety of the interventions identified was not measured in the studies selected. Nevertheless, group vestibular rehabilitation is reported to have no adverse effects (Kleffelgaard *et al.*, 2016, 2019). On the other hand, progressive gait augmentation (Alarie *et al.*, 2022) and interdisciplinary treatment (Hugentobler *et al.*, 2015) appear to be safe.

FINDINGS

- No document specifically dealing with the treatment of persistent dizziness beyond three months has been retrieved;
- Dizziness is often studied in the presence of other symptoms or is sometimes included in a set of symptoms;
- In most studies, the origin of the dizziness is not specified (with or without vestibular cause);
- Among the interventions identified for the treatment of symptoms persisting beyond three months, vestibular rehabilitation was evaluated in three studies, while the other interventions were the subject of a single study each.
- Overall, the interventions identified were effective in improving various persistent symptoms beyond three months, although statistical significance was not always assessed;
- The impact of interventions on dizziness has not been specifically measured, but dizziness-related disability has been measured in three studies of vestibular rehabilitation. The reduction in this indicator suggests an effect of this intervention on dizziness;
- Five other interventions targeting symptoms persisting for more than three months and including dizziness had an impact on the severity of all symptoms measured;
- The safety of interventions was not measured in the studies selected.
- Vestibular rehabilitation has shown no adverse effects; progressive increase in walking and interdisciplinary treatment are also considered safe interventions.

CONCLUSION

The available literature is unable to provide a precise answer to the question of the efficacy and safety of interventions to treat persistent symptoms following mild traumatic brain injury due to a low number of publications. More robust studies, such as randomized controlled trials, are needed to confirm the effectiveness of interventions and to help healthcare professionals intervene in patients with persistent dizziness three months after mild traumatic brain injury.

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