Treatment of sleep disorders following stroke and traumatic brain injury: a systematic review of conservative and complementary medicine interventions

Alex Lowe[1], Terry O'Shaughnessy[2], Vladimir Macavei[2,3]

[1]Royal National Orthopaedic Hospital, Stanmore, UK
[2]Newham University Hospital, London, UK
[3]Barts and The London School of Medicine and Dentistry, London, UK

BSRM & SRR 2019 Joint Scientific Meeting, Warwick, 14th & 15th October 2019

Introduction

Stroke and trauma (traumatic brain injury, TBI) are two of the most common causes of acquired brain injury and sleep disorders are commonly reported in these populations.

For example, insomnia is found in 38% and 29%, and obstructive sleep apnoea (OSA) in 72% and 25%, respectively.

Sleep disorders may impact on patient outcomes and treatment should be individualised and can include conservative, pharmacological, and ventilatory options.

Conservative interventions can include education, psychotherapy, and exercise, but less is known about how beneficial these techniques are following stroke or TBI.

AIM: To systematically review the literature to identify conservative or complementary medicine interventions that aimed to improve the sleep in adult patients with a history of stroke or TBI

Methods

Search: Embase, PubMed, and the Cochrane library were searched for all experimental and meta-analyses published prior to 7th February 2019 that assessed a conservative or complementary medicine intervention to improve the sleep (or sleep disorder) of humans with a history of stroke or TBI

Our systematic review was guided by the PRISMA statement.

One author (A.L.) performed initial screening and two authors (A.L. and V.M.) independently assessed articles for relevance by reviewing publication titles and abstracts. The third author (T.O.) was to be consulted if an agreement could not be made.

Inclusion criteria: published (or in press) original experimental studies or meta-analyses in English that assessed a conservative or complementary medicine intervention to improve the sleep (or sleep disorder) of humans with a history of stroke (involving the brain) or TBI, in either a hospital or community setting, using a formal sleep questionnaire, sleep-wake diary, or objective methods to assess sleep.

Quality assessments: Two authors assessed study quality using the Cochrane Risk of Bias Tool or the Methodological Index for Non-Randomised Studies instrument (A.L. and V.M.).

Results

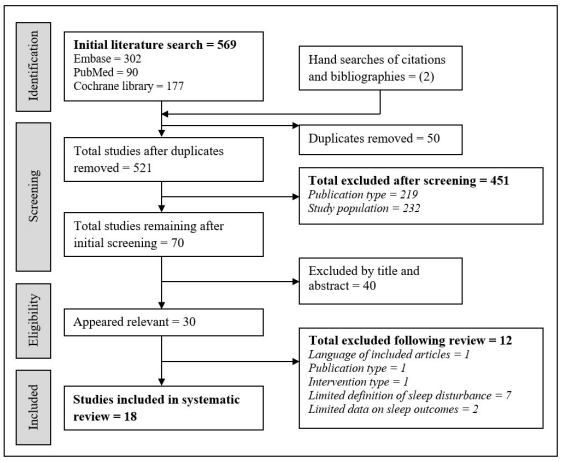
We identified 18 experimental studies that assessed a conservative or complementary medicine intervention to improve the sleep (or sleep disorder) of humans with a history of stroke or TBI

Publications/Populations: The majority were randomised controlled trials (n=14) in adults with a history of either stroke (n=6), TBI (n=11), or combined populations (n=1) that were frequently conducted in an outpatient/community setting (n=15).

Sleep Assessments: Sleep was assessed most often by subjective measures (n=14) but objective methods involved actigraphy (n=3) or polysomnography (n=1).

Interventions: Conservative or complementary medicine interventions were psychotherapy (n=6), exercise (n=5), acupuncture (n=4), or other interventions (n=3).

Quality Assessments: Common themes in randomised controlled trials were high risk of bias with participant blinding and an unclear risk of bias from selective reporting. Those assessing acupuncture had a number of areas with unclear/high risk of bias. Non-randomised trials scored lower most often in the categories of appropriate endpoints, loss to follow-up, and sample size calculations.



Discussion

1. Psychotherapy

These articles identified by this systematic review were all in community settings and suggested that civilians and veterans with a range of injuries may benefit at least initially from cognitive-behavioural or problem-solving therapies.

Given the potential relationships with cognition and depression, these should be further explored in future studies that have a longer follow-up to help determine who may benefit from additional support and in what form this is most appropriate.

2. Exercise

Our systematic review identified a variety of exercise-based interventions and these were at risk of bias from unclear selective reporting and blinding. Future studies in this area may also consider using other assessment measures, such as sleep-wake diaries or actigraphy.

3. Acupuncture

Acupuncture was explored in both early hospital admission and in the community setting with positive short-term results using questionnaires and actigraphy. Unfortunately, there was unclear/high risk of selection and performance bias and of selective reporting.

4. Other Interventions

Individual studies assessed oropharyngeal muscle exercises for OSA, evening warm footbaths, or blue light therapy that showed either small or no benefits.

Conclusions

Psychotherapy-based approaches and acupuncture might be useful for sleep disturbance whereas evidence for exercise was less clear

A large proportion of these publications were small and included a range in the type, severity, and time since injury.

Future studies may wish to also investigate interventions earlier after injury, account for cognitive impairment and depression, and use a combination of subjective and objective measures to assess sleep.

Selected References

- Lowe A, Neligan A, Greenwood R. Sleep disturbance and recovery during rehabilitation after traumatic brain injury: a systematic review. Disabil Rehabil. 2019 [Epub ahead of print].
- Nguyen S, McKenzie D, McKay A, et al. Exploring predictors of treatment outcome in cognitive behavior therapy for sleep disturbance following acquired brain injury. Disabil Rehabil. 2018 Aug;40:1906-1913.

[1]Correspondence: alexlowe@nhs.net