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Cochrane Database of Systematic Reviews 2015, Issue 12. Art. No.: CD004170.
DOI: 10.1002/14651858.CD004170.pub3.

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[Intervention Review]

Multi-disciplinary rehabilitation for acquired brain injury in adults of working age

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Editorial group: Cochrane Injuries Group.
Publication status and date: New search for studies and content updated (conclusions changed), published in Issue 12, 2015.

Citation: Turner-Stokes L, Pick A, Nair A, Disler PB, Wade DT. Multi-disciplinary rehabilitation for acquired brain injury in adults of working age. *Cochrane Database of Systematic Reviews* 2015, Issue 12. Art. No.: CD004170. DOI: 10.1002/14651858.CD004170.pub3.

ABSTRACT

Background

Evidence from systematic reviews demonstrates that multi-disciplinary rehabilitation is effective in the stroke population, in which older adults predominate. However, the evidence base for the effectiveness of rehabilitation following acquired brain injury (ABI) in younger adults has not been established, perhaps because this scenario presents different methodological challenges in research.

Objectives

To assess the effects of multi-disciplinary rehabilitation following ABI in adults 16 to 65 years of age.

Search methods

We ran the most recent search on 14 September 2015. We searched the Cochrane Injuries Group Specialised Register, *The Cochrane Library*, Ovid MEDLINE(R), Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid OLDMEDLINE(R), Embase Classic+Embase (OvidSP), Web of Science (ISI WOS) databases, clinical trials registers, and we screened reference lists.

Selection criteria

Randomised controlled trials (RCTs) comparing multi-disciplinary rehabilitation versus routinely available local services or lower levels of intervention; or trials comparing an intervention in different settings, of different intensities or of different timing of onset. Controlled clinical trials were included, provided they met pre-defined methodological criteria.

Data collection and analysis

Three review authors independently selected trials and rated their methodological quality. A fourth review author would have arbitrated if consensus could not be reached by discussion, but in fact, this did not occur. As in previous versions of this review, we used the method described by Van Tulder 1997 to rate the quality of trials and to perform a 'best evidence' synthesis by attributing levels of evidence on the basis of methodological quality. Risk of bias assessments were performed in parallel using standard Cochrane methodology. However, the Van Tulder system provided a more discriminative evaluation of rehabilitation trials, so we have continued to use it for our primary synthesis of evidence. We subdivided trials in terms of severity of brain injury, setting and type and timing of rehabilitation offered.

Main results

We identified a total of 19 studies involving 3480 people. Twelve studies were of good methodological quality and seven were of lower quality, according to the van Tulder scoring system. Within the subgroup of predominantly mild brain injury, 'strong evidence' suggested

that most individuals made a good recovery when appropriate information was provided, without the need for additional specific interventions. For moderate to severe injury, 'strong evidence' showed benefit from formal intervention, and 'limited evidence' indicated that commencing rehabilitation early after injury results in better outcomes. For participants with moderate to severe ABI already in rehabilitation, 'strong evidence' revealed that more intensive programmes are associated with earlier functional gains, and 'moderate evidence' suggested that continued outpatient therapy could help to sustain gains made in early post-acute rehabilitation. The context of multi-disciplinary rehabilitation appears to influence outcomes. 'Strong evidence' supports the use of a milieu-oriented model for patients with severe brain injury, in which comprehensive cognitive rehabilitation takes place in a therapeutic environment and involves a peer group of patients. 'Limited evidence' shows that specialist in-patient rehabilitation and specialist multi-disciplinary community rehabilitation may provide additional functional gains, but studies serve to highlight the particular practical and ethical restraints imposed on randomisation of severely affected individuals for whom no realistic alternatives to specialist intervention are available.

Authors' conclusions

Problems following ABI vary. Consequently, different interventions and combinations of interventions are required to meet the needs of patients with different problems. Patients who present acutely to hospital with mild brain injury benefit from follow-up and appropriate information and advice. Those with moderate to severe brain injury benefit from routine follow-up so their needs for rehabilitation can be assessed. Intensive intervention appears to lead to earlier gains, and earlier intervention whilst still in emergency and acute care has been supported by limited evidence. The balance between intensity and cost-effectiveness has yet to be determined. Patients discharged from in-patient rehabilitation benefit from access to out-patient or community-based services appropriate to their needs. Group-based rehabilitation in a therapeutic milieu (where patients undergo neuropsychological rehabilitation in a therapeutic environment with a peer group of individuals facing similar challenges) represents an effective approach for patients requiring neuropsychological rehabilitation following severe brain injury. Not all questions in rehabilitation can be addressed by randomised controlled trials or other experimental approaches. For example, trial-based literature does not tell us which treatments work best for which patients over the long term, and which models of service represent value for money in the context of life-long care. In the future, such questions will need to be considered alongside practice-based evidence gathered from large systematic longitudinal cohort studies conducted in the context of routine clinical practice.

PLAIN LANGUAGE SUMMARY

Rehabilitation for adults of working age who have a brain injury

Background: Studies show that multi-disciplinary (MD) rehabilitation is beneficial for patients with brain damage from stroke. Some MD programmes are targeted to working-age adults who have brain injury following trauma or other causes. These patients tend to be younger than most stroke patients and may have different treatment goals, such as returning to work or parenting. Brain-injured people can have a variety of difficulties, including problems with physical functions, communication, thought processes, behaviour or emotions. The seriousness of problems can vary from mild to severe. MD rehabilitation addresses one or more of these areas instead of focusing on a single aspect such as physical (motor) function.

Review question: The authors of this Cochrane review looked for studies of MD rehabilitation in adults, 16 to 65 years of age, with acquired brain injury (ABI) from any cause.

Study characteristics: Studies eligible for inclusion in this review were controlled trials, in which one group of people received treatment (such as MD rehabilitation) and was compared with a similar group that received a different treatment. We found 19 relevant studies, which involved a total of 3480 people.

Search date: We searched the medical literature worldwide on 14 September 2015.

Review methods: We used the Van Tulder system to rate the strength of the evidence as it distinguished better between trials of different quality than the standard GRADE system on criteria that are important in the context of rehabilitation.

Key results: For mild brain injury, information and advice were usually more appropriate than intensive rehabilitation. As a whole, studies suggest that patients with moderate to severe brain injury who received more intensive rehabilitation showed earlier improvement, and that earlier rehabilitation was better than delayed treatment. Strong evidence supports the provision of cognitive rehabilitation in a therapeutic 'milieu', that is, an environment in which patients receive predominantly group-based rehabilitation alongside a peer group of others who are facing similar challenges. Trial-based literature provided little evidence related to other aspects of MD rehabilitation, so the review authors recommend that additional research should be done. Rehabilitation for brain injury is such an individualised and long-term process that research studies do not necessarily facilitate general conclusions.

Quality of the evidence: Overall the included studies were of good quality; 12 of 19 studies were judged to be of high quality according to the van Tulder scoring system. The other studies were at risk of bias because of elements of their design, for example, in one study, treatment depended on the availability of a bed in the rehabilitation unit. Bed availability is a haphazard way of allocating treatment to patients, and this makes results of the study prone to bias.