Systematic review of the literature on pain in patients with polytrauma including traumatic brain injury

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CRD summary
This review evaluated the assessment and management of pain in patients with polytraumatic injuries, including traumatic brain injury and blast-related headache. The authors concluded that there was little evidence to guide pain assessment and treatment approaches. This conclusion reflects the evidence presented, but a cautious interpretation of reliability might be necessary due to potential biases in the review process.

Authors' objectives
To evaluate the assessment and management of pain in patients with polytraumatic injuries, including traumatic brain injury and blast-related headache. The review also identified patient, clinician, and system factors associated with pain-related outcomes (not assessed in this abstract.)

Searching
PubMed, PsycINFO, Cochrane Central Register of Controlled Trials (CENTRAL), PILOTS (Published International Literature on Traumatic Stress), REHABDATA, the bibliographic database of the National Rehabilitation Information Center, and the Department of Defence Technical Information Center databases were searches for published studies from 1950 to 2008. Search terms were reported. Additional articles were sought (including those published prior to 1950) from reference lists, reviews, editorials, and consultation with experts. Eligible studies had to provide an English-abstract.

Study selection
Eligible for inclusion in the review were studies conducted in rehabilitation or post-rehabilitation settings that assessed the reliability and validity of tools and treatment options for pain (pain intensity and pain-related function or interference) in patients with polytraumatic injury pain. Pain had to be measured at least three months from the injury date. Studies of post-traumatic or post-concussive headache were excluded unless patients with moderate or severe head injury were present, or the majority were those with blast-related head injury. Polytrauma was defined as concurrent injury to two or more body parts or systems resulting in cognitive, physical, psychological, or other psychosocial impairments. Traumatic brain injury was classed as polytrauma if the head injury was associated with cognitive consequences. Combat-related mental conditions co-occurring with injury to at least one other system was also defined as polytrauma.

The interventions in included studies were inpatient rehabilitation, intrathecal baclofen, topical capsaicin, and spinal cord stimulation. Most of the included patients had polytrauma including traumatic brain injury. Reported outcomes were relief for spasticity associated with traumatic brain injury and related injuries, and reductions in pain and opioid use. There was no distinction between studies that included patients injured in combat, those who were exposed to blast, and those injured in other settings.

Three reviewers selected studies for inclusion in the review.

Assessment of study quality
The planned quality assessment of controlled studies used an established checklist, including randomisation, allocation concealment, confounding, loss to follow-up, outcome measurements, definition of interventions, and robustness of the analysis. There was no quality assessment of uncontrolled study designs.

The authors did not state how many reviewers proposed to carry out the quality assessment.

Data extraction
The methods of data extraction were not reported.

**Methods of synthesis**
A limited narrative synthesis of uncontrolled studies was reported.

**Results of the review**
Twenty-two case reports or case series and one retrospective cohort study were included in the review.

Inpatient rehabilitation was marginally associated with increased rate of return to work and a reduced likelihood of working fewer hours (one study). Intrathecal baclofen may have assisted spasticity associated with traumatic brain injury and related injuries (five studies).

Topical capsaicin may have been effective for pain relief for complex regional pain syndrome (one study)

Spinal cord manipulation may have decreased pain and opioid use in military personnel (one study).

There were no studies that assessed treatments for persistent blast-related headache pain. There were no studies that assessed the reliability and validity of pain measures relating to pain intensity or pain-related function in patients with cognitive deficits due to traumatic brain injury. There were no controlled studies that tested the efficacy or effectiveness of treatments for patients with polytraumatic pain.

**Authors' conclusions**
There was very little evidence to guide pain assessment and treatment approaches in patients with pain arising from polytrauma.

**CRD commentary**
The review question was clearly stated. The inclusion criteria were broad. The search strategy appeared to include some appropriate sources, but publication and language restrictions may mean that the respective biases may have been introduced. The process for selecting studies included some attempt to minimise bias and error. The proposed procedures for reducing errors and bias in the validity assessment and data extraction phases of the review were not reported.

An appropriate validity assessment tool was selected to evaluate specific study designs. Full details were not provided for any of the uncontrolled studies.

The authors' conclusion reflects the evidence presented, but a cautious interpretation of reliability might be necessary due to potential biases in the review process.

**Implications of the review for practice and research**
**Practice:** The authors did not state any specific implications for practice.

**Research:** The authors stated several implications for research including the development of reliable and valid pain assessment tools to suit different levels of communicativeness and brain injury, and the incorporation of multiperspective information to modify these tools. Trials are also needed to evaluate non-pharmacological interventions and integrated treatment options and to compare their effectiveness for common core conditions. Trials of non-pharmacologic and pharmacologic interventions are needed for blast-related headache pain.

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