Effectiveness of Non-pharmacological and Non-surgical Interventions to Support Pain Management after Spinal Cord Injury

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Background

- Estimates of chronic pain prevalence after spinal cord injury (SCI) vary between 26% and 80% (Owens, Bruce & Zerva, 2009; Cardenas et al., 2004; Reeser-Lancaster, Ahmed & Burnside, 2000).
- Chronic pain has a substantial impact in terms of psychological functioning and social integration (Jensen, Hoffman & Cartwright, 2005).
- Pharmacological treatments, such as non-steroidal anti-inflammatory drugs are used rarely (Cardenas & Jensen, 2006).
- Research has shown that people with SCI have less satisfaction with their pain than people with cancer (Cardenas & Jensen, 2006).
- Greater use of NPNSIs could potentially reduce dependency on medication.

A search of the Cochrane Collaboration’s library of systematic reviews did not reveal any existing systematic reviews on NPNSIs in the area of spinal cord injury.

Aim

To determine the scope and effectiveness of non-pharmacological and non-surgical interventions (NPNSIs) to manage pain after SCI.

Design

Systematic narrative review of randomized controlled trials

Methods

Sources

Four electronic databases: Medline, Embase, Cinahl, PsycInfo

Search

Boolean search string combinations of thesaurus text word terms and expert search strings (Cochrane reviews, Centre for Reviews and Dissemination, York, UK) for ‘spinal injuries’, ‘chronic pain’ and ‘randomized controlled trial’.

Four electronic databases: Medline, Embase, Cinahl, PsycInfo

- Conference abstracts, key journal abstracts and grey literature has not been included in this review after check against the inclusion criteria.
- Two additional papers (Naim, 2008; Soeken, 2002) have been included in this review.
- ‘Spinal cord injuries’ (SCI) in ASIA A-D.
- ‘Chronic neurogenic pain’ or ‘chronic musculoskeletal pain’.
- ‘Spinal cord injury’ (SCI).
- ‘Pain’.

Inclusion Criteria

- Randomized controlled trials controlled trials.
- Inclusion Criteria.

Quality Appraisal

 Jadad Scale: numerical score calculated on the basis of 7 items (randomization, blinding, addition) varying between 0 (weakest) - 5 (strongest) as an indicator of reported study design quality (Jadad, Moore, Carroll et al., 1996).

Results

610 papers were identified after deduplication across the four databases, 13 were included in this review after check against the inclusion criteria. Two additional publications (Naam, 2008; Sorensen, 2002) were identified.

Discussion

The articles in this review have been limited to English language only.

• Limited to controlled trials
• Broader search terms, i.e. cognitive behavioral therapy or a specific search on exercise or hypnosis
• They have not revised the search
• Conference abstracts, journal articles and grey literature have not been considered.

Conclusions

Multi-center trials focused on specific, well defined NPNSIs for people with SCI could enhance the current evidence base. The role of mediating variables, such as self efficacy and perceived control and setting factors in addition to the complex intervention is still not well understood. In addition, the combination of pharmacological and NPNSIs in the context of complex interventions should be investigated in more detail.

References

Please contact the presenting author for a list of references

Acknowledgement

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Data Extraction Table and Quality Rating (Jadad Score)

- Controlled trials on NPNSIs pain management after SCI were identified in four areas: neurogenic, neuromuscular, psychological, and anatomical.
- Trials focused primarily on chronic neurogenic and musculoskeletal pain.
- Most trials used simple VAS and VRS to assess pain intensity alongside multiple pain measures and scales.
- Exercise shows promise but most evidence in this review was generated on the basis of one trial.
- Several trials (e.g. acupuncture, cranial electromagnetic stimulation) have found a time effect, i.e. similar reduction in perceived pain intensity after sham placebo interventions compared to the experimental group.
- Several studies show short-term pain reductions between VAS/VRS assessments before and after sessions.
- Overall quality of trials is poor with an average score of 2.15 (0=weakest, 5=strongest).

Due to the heterogeneity of studies included in this review a meaningful meta-analytic analysis was not possible.

Publication

Jadad Score

Population

NPNSIs

Acupuncture

Hypnosis

Cranial stimulation

Acupuncture

Hypnosis

Systematic narrative review of randomized controlled trials

- A combination of pharmacological and NPNSIs in the context of complex interventions should be investigated in more detail.

Table

<table>
<thead>
<tr>
<th>Study</th>
<th>NPNSI</th>
<th>Population</th>
<th>Design</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcome Measure</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jhun et al. 2002</td>
<td>Acupuncture</td>
<td>Acupuncture</td>
<td>Closed</td>
<td>1) Pilot phase (4 weeks) 2) Main phase (4 weeks)</td>
<td>1) Placebo needles (7sessions) 2) Needles (7 sessions)</td>
<td>VAS (current pain, worst pain, pain relief)</td>
<td>Pain reduction in VAS score 1 (spinal pain) and 2 (overall pain) after 4 weeks of treatment</td>
</tr>
<tr>
<td>Martin-Stein et al. 2003</td>
<td>Hypnosis</td>
<td>Hypnosis</td>
<td>Closed</td>
<td>1) Relaxation training (4 weeks)</td>
<td>1) Group training (4 weeks)</td>
<td>VAS (current pain, worst pain, pain relief)</td>
<td>Pain reduction in VAS score 1 (spinal pain) and 2 (overall pain) after 4 weeks of treatment</td>
</tr>
<tr>
<td>Hildebrandt et al. 2003</td>
<td>Cranial stimulation</td>
<td>Cranial stimulation</td>
<td>Open</td>
<td>1) Electrotherapy stimulation</td>
<td>1) Sham stimulation</td>
<td>VAS (current pain, worst pain, pain relief)</td>
<td>Pain reduction in VAS score 1 (spinal pain) and 2 (overall pain) after 4 weeks of treatment</td>
</tr>
<tr>
<td>Elzer et al. 2003</td>
<td>Acupuncture</td>
<td>Acupuncture</td>
<td>Open</td>
<td>1) Needles (4 sessions)</td>
<td>1) Placebo needles (4 sessions)</td>
<td>VAS (current pain, worst pain, pain relief)</td>
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</tr>
<tr>
<td>Lobbe et al. 2003</td>
<td>Hypnosis</td>
<td>Hypnosis</td>
<td>Open</td>
<td>1) Group training (4 weeks)</td>
<td>1) Group training (4 weeks)</td>
<td>VAS (current pain, worst pain, pain relief)</td>
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</tbody>
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Narrative Summary of Key Findings

- Controlled trials on NPNSIs pain management after SCI were identified in four areas: neurogenic, neuromuscular, psychological, and anatomical.
- Trials focused primarily on chronic neurogenic and musculoskeletal pain.
- Most trials used simple VAS and VRS to assess pain intensity alongside multiple pain measures and scales.
- Exercise shows promise but most evidence in this review was generated on the basis of one trial.
- Several trials (e.g. acupuncture, cranial electromagnetic stimulation) have found a time effect, i.e. similar reduction in perceived pain intensity after sham placebo interventions compared to the experimental group.
- Several studies show short-term pain reductions between VAS/VRS assessments before and after sessions.
- Overall quality of trials is poor with an average score of 2.15 (0=weakest, 5=strongest).
- Randomization and blinding procedures have not been described in detail.
- Most studies reported only findings for small samples, although, especially in control groups was considerable and protocol violations occurred.
- Recruitment of study participants mostly based on convenience or consecutive sampling.

Conclusions

Multi-center trials focused on specific, well defined NPNSIs for people with SCI could enhance the current evidence base. The role of mediating variables, such as self efficacy and perceived control and setting factors in addition to the complex intervention is still not well understood. In addition, the combination of pharmacological and NPNSIs in the context of complex interventions should be investigated in more detail.

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