Effectiveness of Directional Preference to guide Management of Low Back Pain in Canadian Armed Forces Members: A pragmatic study

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Conflict of Interest Disclosure

- Relationships with commercial interests
  - Nil

- Teaching Faculty of McKenzie Institute Canada
  - Anja Franz, PT, Dip. MDT
Scope

• Background information
• Purpose & Objective
• Methods
• Statistical Analyses
• Results
• Conclusion
BACKGROUND
LBP in military populations

LBP a leading cause for:

• Medical & physiotherapy consultations
• Medical evacuations from an operational theatre
• Disability
• Chronicity
• Medical releases

(Cohen et al, 2012; Born et al, 2010; Rowe & Hébert, 2011; Feuerstein et al, 1997)
Management of LBP

Guidelines: directional preference (DP)

• Efficacy of DP-guided management
  ✓ Research setting (ideal conditions)
  ✓ General population  
    (Delitto et al, 2012)

• Effectiveness of DP-guided management
  ? Real-life clinical practice
  ? Military personnel
    • Unique physical, psychological and occupational stresses  
    (Cohen et al, 2012)
OBJECTIVE
Objective

To determine, in real-life clinical practice, the effectiveness of DP-guided management vs usual care (UC) physiotherapy in CAF members suffering from LBP

Hypotheses

DP-guided management more effective than usual care (UC) to:

1. ↓ pain and disability
2. ↓ work loss
3. ↓ health care utilization
METHODS
Methods

- **Design**: Pragmatic non-randomized trial
  - Follow-up at 1 month and 3 months

- **Population**: CAF members with LBP

- **Sample**: 44 consecutive CAF members presenting to the base physiotherapy clinic for LBP
TREATMENT GROUPS

DP Group
• DP-guided management
  • Individualised

UC Group
• Usual care (Ø DP)
  • Individualised
Directional Preference (DP)

• Clinical criteria

• Repeated movements in one spinal direction
  • ↓ distal pain
  • ↑ lumbar range of motion (ROM)

(McKenzie & May, 2003)
# Outcome measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description/ instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SELF-ADMINISTERED QUESTIONNAIRE</strong></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td><strong>24h intensity (NPRS)</strong>, 24h frequency, location</td>
</tr>
<tr>
<td>Perceived disability</td>
<td>Roland-Morris disability questionnaire (RMDQ)</td>
</tr>
<tr>
<td>Self-rated improvement</td>
<td>Pain, function, overall status (PGIC)</td>
</tr>
<tr>
<td>Medication</td>
<td>Number of patients taking pain medication</td>
</tr>
<tr>
<td><strong>ELECTRONIC HEALTH RECORD</strong></td>
<td></td>
</tr>
<tr>
<td>Work status</td>
<td>Off work, MEL(^2) ≤ 30 days, MEL &gt; 30 days, permanent MEL</td>
</tr>
<tr>
<td>Work loss(^3)</td>
<td>Number of days on sick leave or with MELs</td>
</tr>
<tr>
<td>Health care utilization(^3,4)</td>
<td>Number of visits, Investigations</td>
</tr>
</tbody>
</table>

\(^1\)PGIC= perceived global impression of change, \(^2\)MEL=medical employment limitations, \(^3\)measured at 3-month follow-up, \(^4\)excludes physiotherapy visits.
Statistical Analysis

• Sample size
  • \( \Delta \) 2 points on 11-point numerical pain rating scale
  • Alpha: 0.05
  • Power 80%

• Baseline characteristics
  • Categorical variables: Chi-squared or Fisher exact tests
  • Continuous variables: independent t-tests, Mann-Whitney \( U \)-tests

• Treatment effects
  • Categorical variables: Chi-squared or Fisher exact tests
  • Continuous variables: repeated measures ANOVA (group x time), independent t-tests, Mann-Whitney \( U \)-tests
RESULTS
RESULTS

Patients who met eligibility criteria (n=47)

Declined invitation to participate (n=3)
   no reason (n=1), francophone (n=2)

Signed consent and assigned to treatment groups (n=44)

DP group (n=22)
   1-month follow-up (n=22)
   3-month follow-up (n=22)

UC group (n=22)
   1-month follow-up (n=21)
      Withdrawal: 1 (4.5%); time constraints
   3-month follow-up (n=21)
## Baseline Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>DP Group</th>
<th>UC Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>33.9 (9.7)</td>
<td>38.0 (8.8)</td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>15 (68.2)</td>
<td>14 (66.7)</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>27.2 (4.0)</td>
<td>27.1 (4.6)</td>
</tr>
<tr>
<td>Comorbidities (1 to 2), n (%)</td>
<td>7 (31.8)</td>
<td>9 (42.9)</td>
</tr>
<tr>
<td>Previous episodes of LBP, n (%)</td>
<td>17 (77.3)</td>
<td>20 (95.2)</td>
</tr>
<tr>
<td>Onset &gt; 3 months, n (%)</td>
<td>12 (54.5)</td>
<td>8 (38.1)</td>
</tr>
<tr>
<td>Thigh pain, n (%)</td>
<td>10 (45.5)</td>
<td>9 (42.9)</td>
</tr>
<tr>
<td>Pain below knee, n (%)</td>
<td>5 (22.7)</td>
<td>4 (19.0)</td>
</tr>
</tbody>
</table>

\( p > 0.05 \)
## Baseline Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Taking medication, n (%)</td>
<td>9 (40.9)</td>
<td>12 (57.1)</td>
</tr>
<tr>
<td>Officers, non-commissioned officers, n (%)</td>
<td>3 (13.6)</td>
<td>9 (42.9)</td>
</tr>
<tr>
<td>Off work, n (%)</td>
<td>4 (18.2)</td>
<td>1 (4.8)</td>
</tr>
<tr>
<td>Light duty, n (%)</td>
<td>9 (40.9)</td>
<td>7 (33.3)</td>
</tr>
<tr>
<td>Physical job demands, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sedentary/ light</td>
<td>4 (18.2)</td>
<td>12 (57.1)</td>
</tr>
<tr>
<td>• Medium</td>
<td>10 (45.5)</td>
<td>6 (28.6)</td>
</tr>
<tr>
<td>• Heavy/ very heavy</td>
<td>8 (36.4)</td>
<td>3 (14.3)</td>
</tr>
</tbody>
</table>
Prevalence of DP

- Day 1: 16/22 (73%)
- Day 4: 20/22 (90.9%)
- Non-responders: 2/22 (9.1%)
  - Included in statistical analysis

DP group only!
RESULTS

CHANGES IN 24-HOUR INTENSITY OF LBP

<table>
<thead>
<tr>
<th>TIME</th>
<th>DP Group</th>
<th>UC Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>▲</td>
<td>▲</td>
</tr>
<tr>
<td>1 month</td>
<td>∆ = 1.9</td>
<td>∆ = 1.3</td>
</tr>
<tr>
<td>95% CI: 0.97; 2.89</td>
<td>95% CI: 0.35; 2.31</td>
<td></td>
</tr>
</tbody>
</table>

p = 0.007
RESULTS

CHANGES IN LOW BACK DISABILITY

<table>
<thead>
<tr>
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<th>UC Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>( \Delta = 4.3 )</td>
<td>( \Delta = 3.5 )</td>
</tr>
<tr>
<td>3 months</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

95% CI: \( 2.12; 6.38 \)  
95% CI: \( 1.59; 5.33 \)

\( p=0.05 \)
RESULTS

PROPORTION OF PATIENTS WITH IMPROVEMENT IN PAIN LOCATION

<table>
<thead>
<tr>
<th>TIME</th>
<th>DP Group</th>
<th>UC Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>54.5%</td>
<td>19.0%</td>
</tr>
<tr>
<td>3 months</td>
<td>68.2%</td>
<td>38.1%</td>
</tr>
</tbody>
</table>

p=0.02
p=0.05
PROPORTION OF PATIENTS WITH SELF-RATED IMPROVEMENT FOR PAIN, FUNCTION AND OVERALL STATUS

<table>
<thead>
<tr>
<th></th>
<th>1 MONTH</th>
<th>3 MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAIN</td>
<td>86.4%</td>
<td>95.5%</td>
</tr>
<tr>
<td></td>
<td>57.1%</td>
<td>71.4%</td>
</tr>
<tr>
<td>FUNCTION</td>
<td>81.8%</td>
<td>90.9%</td>
</tr>
<tr>
<td></td>
<td>47.6%</td>
<td>71.4%</td>
</tr>
<tr>
<td>OVERALL STATUS</td>
<td>86.4%</td>
<td>95.5%</td>
</tr>
<tr>
<td></td>
<td>57.1%</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

DP Group | UC Group

*p ≤ 0.05

RESULTS
RESULTS

PROPORTION OF PATIENTS WITH IMPROVEMENT IN WORK STATUS

PROPORTION OF PATIENTS

<table>
<thead>
<tr>
<th>TIME</th>
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<th>UC Group</th>
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</thead>
<tbody>
<tr>
<td>1 month</td>
<td>54.5%</td>
<td>28.6%</td>
</tr>
<tr>
<td>3 months</td>
<td>54.5%</td>
<td>23.8%</td>
</tr>
</tbody>
</table>

p=0.08

p=0.04
DP-guided management

DP-guided management effective to:

- ↓ Pain (intensity, frequency)
- ↓ Low-back specific disability
- ↓ Duration of LBP-related work limitations
- Most patients can self-manage

ADVANTAGEOUS IN DEPLOYED SETTINGS
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REFERENCES
References:


