Personal and work-related risk factors for incident rotator cuff syndrome in a French working population

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Context

- Musculoskeletal disorders (MSDs): One of the most significant and costly health problems in the working population

- Surveillance system for MSD implemented in the Pays de la Loire region by the French Institute for Public Health Surveillance in 2002-2005

- Rotator cuff syndrome (RCS): 7% of workers
Aim

To identify personal and work-related factors for incident RCS among a large French working population
Methods

- **Baseline: 2002-2005**
  - Network of 83 occupational physicians
  - 3,710 workers randomly selected
  - **Self-administered Questionnaire**
    - Individual factors
    - Work-related factors (work organization, biomechanical and psychosocial factors)
- **Physical examination**

- **Follow-up: 2007-2010**
  - **Physical examination**
Case definition

Rotator cuff syndrome defined following the recommendations of the European consensus Saltsa¹

Case definition 2: rotator cuff syndrome, based on symptoms and physical examination signs

Time rule: • Symptoms present now or on at least 4 days during the last 7 days

AND

Symptoms: • At least intermittent pain in the shoulder region without paresthesias; pain worsened by active elevation movement of the upper arm as in scratching of the upper back

AND

Signs: • At least one of the following tests positive:
  ▲ resisted shoulder abduction, external rotation, or internal rotation
  ▲ resisted elbow flexion
  ▲ painful arc on active upper arm elevation

Analysis

- Logistic regression
  - Outcome:
    - Workers free of RCS at baseline with diagnosed RCS at follow-up.
  - Potential risk factors at baseline:
    - Personal factors (age, BMI,…)
    - Work organization (work pace dependent on automatic rate, job/task rotation, temporary employment, …)
    - Biomechanical factors (arms above shoulder level, use of vibrating hand tools, perceived physical exertion (Borg),…)
    - Psychosocial work factors (validated French version of Karasek’s Job Content Questionnaire)

- By gender
Results (1)

- 2002-2005
  - 3,710 workers

- 2007-2010

1,611 workers seen during a regularly scheduled mandatory health examination

- 150 workers with RCS at baseline
- 5 workers with unknown diagnosis of RCS at follow-up

1,456 workers included in the analyses
Results (2)

- 51 incident cases of RCS in men (6.1%)
- 45 cases in women (7.3%)
Results (3)

- Bivariate analyses showed that:
  - personal characteristics,
  - work organization,
  - biomechanical factors and
  - psychosocial factors

were associated with incident RCS
## Risk factors for incident RCS in men

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>95% CI</th>
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</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>40-44</td>
<td>2.3</td>
<td>(1.0 to 5.2)</td>
</tr>
<tr>
<td>45-49</td>
<td>4.7</td>
<td>(2.2 to 10.0)</td>
</tr>
<tr>
<td>≥50</td>
<td>3.7</td>
<td>(1.5 to 9.0)</td>
</tr>
<tr>
<td><strong>High perceived physical exertion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AND Armss above shoulder level (≥2h/day)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No factor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>2.0</td>
<td>(1.0 to 3.8)</td>
</tr>
<tr>
<td>Both factors</td>
<td>3.3</td>
<td>(1.3 to 8.4)</td>
</tr>
<tr>
<td><strong>Low coworker support</strong> (yes vs no)</td>
<td>2.0</td>
<td>(1.1 to 3.9)</td>
</tr>
</tbody>
</table>

†RPE Borg scale ≥15.
## Risk factors for incident RCS in women

<table>
<thead>
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<tbody>
<tr>
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<td>45-49</td>
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<td>(1.4 to 8.0)</td>
</tr>
<tr>
<td>≥50</td>
<td>5.5</td>
<td>(2.3 to 13.2)</td>
</tr>
<tr>
<td>Work with temporary workers (yes vs no)</td>
<td>2.2</td>
<td>(1.2 to 4.2)</td>
</tr>
<tr>
<td>Arm abduction (60° to 90°) (yes vs no)</td>
<td>2.6</td>
<td>(1.4 to 5.0)</td>
</tr>
</tbody>
</table>
Discussion

- **Positive points**
  - Large working population
  - RCS clinically diagnosed by trained OPs

- **Limitations**
  - Exposure data self-reported: some misclassification?
  - Extra-occupational physical activities and individual psychological factors (anxiety, depression, traumatic life events, etc) not assessed
Conclusion

Main results

- Different risk factors according to gender
- Arm abduction was the major work-related risk factor
- Psychosocial factor only for men
- Effect of age

Mechanical and psychosocial exposure should be an important target for strategies for the prevention of RCS in the working population

Thank you for your attention