Incidence of sports-related injuries and illnesses in Paralympic athletes – a prospective 52 week study

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Disclosure

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Introduction

- Successful injury/illness surveillance during the Paralympic games shows that sports-related injuries and illnesses are a concern.
- Few prospective studies over time.
- To search for complex patterns, data collection over time is needed.
- Risk factors based on exposure during competition and training.
The Sports-related Injury and Illness in Paralympic Sport Study (SRIIPSS)

- Literature search and critical review
  Fagher & Lexell 2014

- Athletes’ perceptions of experiences
  Fagher et al. 2016

- Development & structure of study protocol
  Fagher et al. 2016

- Development & evaluation of eHealth application
  Fagher et al. 2017

- Prevalence of injuries & illnesses. Athlete demographics & behavior
  Fagher et al. 2019

- Incidence, severity and risk factors of injuries & illnesses
  Under review
Aim

• To describe the annual incidence of injuries and illnesses among Paralympic athletes and to assess risk factors
Methods

• **Study design:** Closed longitudinal prospective study
• **Participants:** 107 Swedish athletes, candidates for the Paralympic Games
• **Data collection:** Electronic self-reports in an adapted eHealth application
• **Definitions:** Any new musculoskeletal pain, feeling, injury, illness or psychological complaint that made the athlete partially or completely abstain from training or competition
• **Statistics:** Descriptive statistics (incidence rate and incidence proportion), Kaplan Meier survival method, Cox proportional hazards regression, Chi square statistics, Mann Whitney U-test \((p<0.05)\)
Injury incidence

• Incidence rate
  ➢ 6.9/1000 hours of exposure

• Incidence proportion
  ➢ 68% reported a new injury
  ➢ Median time to injury: 19 weeks (95% CI 10.5-27.4)
  ➢ Log-rank tests revealed significant variations in survival distribution:

Gender male

Team sport

Previous severe injury
Type and severity of injuries

**Type**
- 68% overuse
- 32% traumatic

**Severity**
- 34% severe (time loss ≥21 days)

**Body location**
- Shoulder 23%

**Mechanism**
- 85% during training
- Impairment related factors 59%
- 22% collisions

**Associations (p<0.05)**
- Wheelchair & SCI athletes → shoulder injuries
- Ambulatory athletes → lower extremity injuries
- VI athletes → multiple injuries
Illness incidence

• Incidence rate
  ➢ 9.3/1000 hours of exposure

• Incidence proportion
  ➢ 77% reported a new illness
  ➢ Median time to illness: 9 weeks (95% CI 1.40-16.60)
  ➢ Log-rank tests revealed significant variations in survival distribution:

Team sport
Type and severity of illnesses

**Body system**
- 68% upper respiratory tract
- 11% digestive
- 7% urogenital

**Severity**
- 42% minor (4-7 days)

**Type & Onset**
- 84% infections
- 45% overtraining/stress
- 28% impairment related factors
- 17% transmission

**Associations (p<0.05)**
- Wheelchair & SCI athletes → urogenital illnesses
Cox proportional hazard regression

**Table 3.** Cox proportional hazard regression analyses for time to first SRIIPS, presented with hazard ratio (HR), p-value and 95% CI.

<table>
<thead>
<tr>
<th></th>
<th>First injury</th>
<th></th>
<th>First illness</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR</td>
<td>p-value</td>
<td>95% CI</td>
<td>HR</td>
</tr>
<tr>
<td><strong>Simple models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Sport vs Individual sport</td>
<td>1.88</td>
<td>0.007</td>
<td>1.19-2.99</td>
<td>1.55</td>
</tr>
<tr>
<td>Sex (Male vs female)</td>
<td>1.76</td>
<td>0.029</td>
<td>1.06-2.93</td>
<td>1.22</td>
</tr>
<tr>
<td>Previous severe injury/illness last year</td>
<td>2.37</td>
<td>&lt;0.001</td>
<td>1.47-3.83</td>
<td>1.18</td>
</tr>
<tr>
<td>Age (26-34 years vs 18-25 or 35-63 years)</td>
<td>1.13</td>
<td>0.668</td>
<td>0.65-1.94</td>
<td>1.24</td>
</tr>
<tr>
<td>Impairment VI vs II and PI, VI vs II, SCI, limb deficiency, central neurological, les autres</td>
<td>1.15</td>
<td>0.613</td>
<td>0.67-1.99</td>
<td>1.52</td>
</tr>
<tr>
<td>Training load middle vs high and low</td>
<td>1.58</td>
<td>0.115</td>
<td>0.90-2.78</td>
<td>1.40</td>
</tr>
<tr>
<td>Winter sport vs Summer sport</td>
<td>1.38</td>
<td>0.266</td>
<td>0.78-2.44</td>
<td>1.00</td>
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<tr>
<td>Wheelchair user vs Ambulatory</td>
<td>1.08</td>
<td>0.729</td>
<td>0.69-1.72</td>
<td>0.92</td>
</tr>
<tr>
<td><strong>Multiple models with interactions</strong></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Team sport*Summer sport</td>
<td>2.01</td>
<td>0.005</td>
<td>1.29-3.29</td>
<td></td>
</tr>
<tr>
<td>Male*Previous Illness</td>
<td>2.13</td>
<td>0.040</td>
<td>1.04-4.36</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

• First long-term prospective evaluation of injuries & illnesses in Parasport
• Fairly high incidence
• Male athletes, athletes in team sports and with previous incidents at risk, and should therefore be targets for preventive measures
• No risk factors associated with a specific impairment
• A variety of acute injuries, overuse injuries and illnesses
• Biopsychosocial prevention on primary, secondary & tertiary levels
• Need for surveillance in different settings
Thanks

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