Factors predictive of survival and cumulative survival rate following spinal cord injury in Hong Kong - A retrospective study in Kowloon Hospital

LEE YT, NG HP, CHAN HL, TO TS
DEPARTMENT OF OCCUPATIONAL THERAPY,
KOWLOON HOSPITAL
CHEUNG PCL, CHENG KHW, LI KK, LI W
DEPARTMENT OF ORTHOPAEDICS & TRAUMATOLOGY,
QUEEN ELIZABETH HOSPITAL
Survival Analysis of Spinal Cord Injury Patients

• Local studies are lacking
• Evaluate treatment outcome
• Allocate resources
• Life planning

**Methodology:**

• **Subject**
  - 436 SCI patients discharged from Kowloon Hospital since 2002

• **Analysis**
  - Cox proportional hazards regression

• **Variables**
  - Age
  - Gender
  - Traumatic / Non-traumatic SCI
  - Complete (AIS A) / incomplete SCI (AIS B-D)
  - Para/ tetraplegia
  - Functional Independence Measure
  - Bladder function
  - Discharge destination
Cox Regression Analysis

Independent predictive factors of decreased survival:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Hazard Ratio (HR(95%CI))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased age (per 10 years)</td>
<td>1.58 (1.36-1.82)</td>
</tr>
<tr>
<td>Institutional care upon discharge</td>
<td>2.01 (1.37-2.94)</td>
</tr>
<tr>
<td>Bladder dysfunction</td>
<td>1.53 (1.02-2.28)</td>
</tr>
<tr>
<td>Discharge FIM score less than 54</td>
<td>1.694 (1.03-2.79)</td>
</tr>
<tr>
<td>(Maximal assistance to dependent in ADL)</td>
<td></td>
</tr>
</tbody>
</table>

Variables in the Equation:

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% CI for Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.046</td>
<td>.007</td>
<td>37.596</td>
<td>1</td>
<td>.000</td>
<td>1.047</td>
<td>1.031-1.062</td>
</tr>
<tr>
<td>Sex</td>
<td>-.155</td>
<td>.202</td>
<td>.584</td>
<td>1</td>
<td>.445</td>
<td>.857</td>
<td>.577-1.273</td>
</tr>
<tr>
<td>Traumatic SCI</td>
<td>-.044</td>
<td>.189</td>
<td>.053</td>
<td>1</td>
<td>.817</td>
<td>.957</td>
<td>.660-1.387</td>
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<tr>
<td>Complete SCI</td>
<td>.138</td>
<td>.362</td>
<td>.145</td>
<td>1</td>
<td>.703</td>
<td>1.148</td>
<td>.565-2.332</td>
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<tr>
<td>FIM ≤ 54</td>
<td>.527</td>
<td>.255</td>
<td>4.266</td>
<td>1</td>
<td>.039</td>
<td>1.694</td>
<td>1.027-2.793</td>
</tr>
<tr>
<td>Voiding dysfunction</td>
<td>.424</td>
<td>.204</td>
<td>4.320</td>
<td>1</td>
<td>.038</td>
<td>1.528</td>
<td>1.024-2.279</td>
</tr>
<tr>
<td>Discharged to Institution</td>
<td>.697</td>
<td>.194</td>
<td>12.871</td>
<td>1</td>
<td>.000</td>
<td>2.008</td>
<td>1.372-2.938</td>
</tr>
<tr>
<td>Tetraplegia</td>
<td>.092</td>
<td>.228</td>
<td>.161</td>
<td>1</td>
<td>.688</td>
<td>1.096</td>
<td>.700-1.715</td>
</tr>
</tbody>
</table>
Cumulative survival rate

- **5-year**
  - Overall: 81%
  - FIM >54: 84%
  - FIM ≤54: 52%

- **10-year**
  - Overall: 70%
  - FIM >54: 73%
  - FIM ≤54: 37%
Discussion

- Increased age, ADL functions upon discharge, bladder function and discharge destination are independent predictors of survival.
- Enhancement of post-discharge support to patients with these characteristics may improve their survival.
- Further study: Predictors found to be significant in international studies but not in this study:
  - “Gender”
  - “Level of lesion”
  - “completeness of SCI”
  - “traumatic vs non-traumatic SCI”