The Neurotrauma Register of Tasmania
Issues of attrition in a population based study 3 years post trauma

Langley J, Johnson S, Slatyer M, Skilbeck CE & Bell T.

Outline of Presentation

- Introduction
- Methods
- Results
- Conclusions
- Future directions for this research
Introduction

- TBI is described within the literature as a silent epidemic
- Researchers have reported a higher prevalence rate than reported incidence
- Many milder TBIs go undetected, undiagnosed and untreated
- They are a difficult group to retain within a research program – particularly longitudinal research
- Identification at those whose survival in studies is at risk is helpful to other researchers and may have correlation with issues of attrition from therapeutic clinical programs
- Important to identify characteristics of attrition rate to exclude potential systematic biases

Issues of attrition

Tasmanian Neurotrauma Register

- Objective of this presentation was to measure our attrition rate in comparison with other TBI studies
- In response to WHO review of TBI studies in 2004
- Comparison became difficult to achieve due to differences in methodology between studies
- It is now a report on Tasmanian Neurotrauma Register experiences in attrition rates
Issues of attrition
Tasmanian Neurotrauma Register

Neurotrauma Register Tasmania
Methods

- Population based prospective study of 947 participants from 2003-2006
- Patients presenting to DEM and/or admitted to the Royal Hobart Hospital
- Prospective data collection time points
  Initial 1 month 3 months
  6 months 12 months 24 months
  36 months

Methods continued..................

- Each assessment took 60-90 minutes
- Physical, cognitive and psychosocial domains
- Demographic and injury variables collected
## Participants

Tasmanian Neurotrauma Register
mean age of 36.08 years (standard deviation = 17.69),

35 percent of participants were female.

- **Injury mechanism:**
  - Motor vehicle/transport: 39%
  - Assaults: 27%
  - Falls: 19%
  - Sport: 7%
  - Other: 8%

- **Employment status:**
  - Employed: 47%
  - Students: 13%
  - Retired: 11%
  - Unemployed: 10%
  - Disability pensioner: 5%
  - Home duties: 4%.

## Overall attrition rate

<table>
<thead>
<tr>
<th>Time point</th>
<th>Percentage of response rate</th>
<th>Attrition Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>One month</td>
<td>78</td>
<td>22</td>
</tr>
<tr>
<td>Three months</td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td>Six months</td>
<td>63</td>
<td>37</td>
</tr>
<tr>
<td>Twelve months</td>
<td>63</td>
<td>38</td>
</tr>
<tr>
<td>2 years</td>
<td>39</td>
<td>61</td>
</tr>
<tr>
<td>3 years</td>
<td>19</td>
<td>81</td>
</tr>
</tbody>
</table>
Table 2. Severity of traumatic brain injury (based on Russell, 1977)

<table>
<thead>
<tr>
<th>Severity</th>
<th>Duration of PTA</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Mild</td>
<td>&lt;= 5 minutes</td>
<td>258</td>
<td>27</td>
</tr>
<tr>
<td>Mild</td>
<td>5 to 60 minutes</td>
<td>211</td>
<td>23</td>
</tr>
<tr>
<td>Moderate</td>
<td>1 to 24 hours</td>
<td>258</td>
<td>27</td>
</tr>
<tr>
<td>Severe</td>
<td>1 to 7 days</td>
<td>147</td>
<td>16</td>
</tr>
<tr>
<td>Very severe</td>
<td>1 to 4 weeks</td>
<td>51</td>
<td>5</td>
</tr>
<tr>
<td>Extremely severe</td>
<td>&gt; 4 weeks</td>
<td>22</td>
<td>2</td>
</tr>
</tbody>
</table>

Break down of level of severity within studied population in TNTR

Attrition based on levels of severity

<table>
<thead>
<tr>
<th></th>
<th>Day 28</th>
<th>Day 90</th>
<th>6 months</th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min and less</td>
<td>74%</td>
<td>62%</td>
<td>58%</td>
<td>52%</td>
<td>45%</td>
<td>33%</td>
</tr>
<tr>
<td>5 min - 1 hour</td>
<td>74%</td>
<td>69%</td>
<td>54%</td>
<td>53%</td>
<td>41%</td>
<td>29%</td>
</tr>
<tr>
<td>1 hour - 24 hours</td>
<td>79%</td>
<td>69%</td>
<td>65%</td>
<td>54%</td>
<td>40%</td>
<td>37%</td>
</tr>
<tr>
<td>1 day - 7 days</td>
<td>88%</td>
<td>70%</td>
<td>67%</td>
<td>60%</td>
<td>49%</td>
<td>54%</td>
</tr>
<tr>
<td>7 days - 28 days</td>
<td>87%</td>
<td>79%</td>
<td>71%</td>
<td>67%</td>
<td>68%</td>
<td>67%</td>
</tr>
<tr>
<td>&gt; 28 days</td>
<td>100%</td>
<td>87%</td>
<td>86%</td>
<td>85%</td>
<td>83%</td>
<td>67%</td>
</tr>
</tbody>
</table>
Total attrition across all levels of severity

**Issues of Attrition**

Tasmanian Neurotrauma Register

- Compare longitudinal data with cross sectional data
- Each time point is assessed separately
- Those withdrawn from the study prior to the time point of interest are subtracted from the original number eligible for assessment at that time point
- The figures represent the attrition at that direct time point
### Cross sectional response rates

<table>
<thead>
<tr>
<th></th>
<th>Day 28</th>
<th>Day 90</th>
<th>6 months</th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min and less</td>
<td>74%</td>
<td>68%</td>
<td>70%</td>
<td>71%</td>
<td>75%</td>
<td>55%</td>
</tr>
<tr>
<td>5 min-1 hour</td>
<td>74</td>
<td>72</td>
<td>66</td>
<td>70</td>
<td>66</td>
<td>65</td>
</tr>
<tr>
<td>1 hour-24 hour</td>
<td>79</td>
<td>72</td>
<td>66</td>
<td>65</td>
<td>57</td>
<td>63</td>
</tr>
<tr>
<td>1 day-7 days</td>
<td>88</td>
<td>72</td>
<td>75</td>
<td>73</td>
<td>69</td>
<td>74</td>
</tr>
<tr>
<td>7 days-28 days</td>
<td>87</td>
<td>79</td>
<td>73</td>
<td>70</td>
<td>83</td>
<td>67</td>
</tr>
<tr>
<td>&gt; 28 days</td>
<td>100</td>
<td>87</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>100</td>
</tr>
</tbody>
</table>

### Analysis

**Cox Regression Analysis**

- PTA 0.08
- Injury age 0.029
- Education total 0.06
- Gender 0.200

One way ANOVA conducted at each time point

- Assault associated with greatest risk of attrition
- Falls and pedestrians associated with greatest retention
Conclusion

- Participants with mTBI have less chance of survival in longitudinal studies
- Age, education and PTA influence the survival of participants within longitudinal studies
- Attrition can be viewed differently dependant upon the methodology applied

Future Direction

- Further analysis of characteristics of participants to predict survival in longitudinal studies
- Application of research to the clinical setting as attrition from therapeutic programs may share some similarities
Tasmanian Neurotrauma Register

Thank you