School of Public Health and Preventive Medicine

Functional outcomes of hip fracture patients in an orthopaedic trauma registry

Dr Christina Ekegren, Research Fellow, Victorian Orthopaedic Trauma Outcomes Registry

Co-authors: Prof Belinda Gabbe, A/Prof Elton Edwards, Prof Richard de Steiger, A/Prof Sue Liew, Prof Richard Page, A/Prof Raphael Hau, A/Prof Andrew Bucknill, Mr Andrew Oppy, Ms Melissa Hart

1 Department of Epidemiology and Preventive Medicine, Monash University, Melbourne
2 Department of Orthopaedic Surgery, The Alfred Hospital, Melbourne
3 Epworth Health, Richmond
4 University of Melbourne, Parkville
5 Department of Surgery, Monash University, Melbourne
6 Department of Orthopaedics, University Hospital Geelong, Geelong
7 School of Medicine, Deakin University, Geelong
8 Department of Orthopaedic Surgery, Royal Melbourne Hospital, Parkville

* p<0.001

Background

• Hip fracture a devastating injury, particularly in the elderly Travis et al. 2015, Marek et al. 2015
• Recent call for improved outcome reporting in younger hip fracture patients Sprague et al. 2015

• The Victorian Orthopaedic Trauma Outcomes Registry (VOTOR) one of very few trauma registries in the world to measure long-term functional outcomes of hip fracture patients

Study aims

• To report mortality, residential, work-related and functional outcomes for VOTOR hip fracture patients
• To determine predictors of work-related and functional outcomes for VOTOR hip fracture patients

Methods

Victorian Orthopaedic Trauma Outcomes Registry cohort study

Patients: Fractured neck of femur or trochanteric fracture
July 2009 – June 2013

Data extracted: population demographics, injury event, ICD-10-AM diagnoses, comorbidities, compensation, surgical details

Outcomes of interest: 6 & 12-month survival, residential status, return to work (RTW) and Extended Glasgow Outcome Scale (GOS-E) at 12 months post-injury

Statistical methods: Summary statistics, multivariable logistic regression analyses

Patient flow chart

Age and gender

Neutral hip fracture patients, July 2009 – June 2013

Patients aged 45-64 years

Patients aged 65 years

Unfused THA

Fused THA

Neutral hip fracture patients, July 2009 – June 2013

 Patients aged <65 years

 Patients aged >65 years

Unfused THA

Fused THA

Mean (SD) age = 78 (16) years

64% female
Cause of injury

<table>
<thead>
<tr>
<th>Cause of Injury</th>
<th>Under 65 years (n=161)</th>
<th>65 years and over (n=3172)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low fall</td>
<td>38%</td>
<td>87%</td>
</tr>
<tr>
<td>High fall</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>Feed</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>28%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Residential status

- 12-month survivors only (n=2706)
  - Returned home without additional assistance 20% (n=540)
  - Required extra assistance at home 39% (n=1,060)
  - Living in a nursing home 29% (n=773)
  - New to a nursing home 41% (n=1,113)

Predictors of Returning to Work <65 years

- Potential predictors on univariable analysis: Age, Gender, Occupation, Comorbid status, Pre-injury level of disability, IRSAD, ARIA, Compensable status, Type of hip fracture, Isolated vs non-isolated hip fracture, Type of hip surgery

- Multivariable analysis (logistic regression)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Independent predictors</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not returning to work</td>
<td>Increasing age</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>'Blue-collar occupation'</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Pre-injury disability</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>Presence of other injuries</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Compensable (TAC/WorkSafe/other)</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Mortality

- 6-month mortality 21% (n=751)
- 12-month mortality 27% (n=973)
  - 65+ years 40% (n=180)

Return to work <65 years

- 88% of those working prior to injury aged <65 years

12-month functional recovery

- < 65 years
  1. Death or vegetative state
  2. Lower severe disability
  3. Upper severe disability
  4. Lower moderate disability
  5. Upper moderate disability
  6. Lower good recovery
  7. Upper good recovery

- ≥ 65 years
  1. Death or vegetative state
  2. Lower severe disability
  3. Upper severe disability
  4. Lower moderate disability
  5. Upper moderate disability
  6. Lower good recovery
  7. Upper good recovery

- 12-month survivors only (n=2706)
  - Returned home without additional assistance 20% (n=540)
  - Required extra assistance at home 39% (n=1,060)
  - Living in a nursing home 29% (n=773)
  - New to a nursing home 41% (n=1,113)
Predictors of Functional recovery

- Potential predictors on univariable analysis: Age, Gender, Comorbid status, Dementia, Pre-injury level of disability, ARA, Cause of injury, Compensable status, Isolated vs non-isolated hip fracture, Type of hip surgery
- Multivariable analysis (ordered logistic regression)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Outcome</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older age &gt;65 years</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Male sex</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Presence of comorbidities</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Dementia</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Low fall</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pre-injury disability</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Presence of other injuries</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Compensable (TAC/WorkSafe/other)</td>
<td>Worse</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Study limitations

- Representativeness of the sample
  - Only the four hospitals included in VOTOR contributed data

- Use of data from VOTOR
  - Unable to adjust for factors such as fracture severity or magnitude of associated injuries
  - Follow-up to 12-months only
  - Observational study, causality cannot be confirmed

Conclusions

- Younger hip fracture patients distinctly different to older counterparts
- Much lower mortality in younger patients
- Significant morbidity in all hip fracture patients
- 10% younger hip fracture patients did not return to work
- 40% all patients required additional assistance at home
- Moderate to severe ongoing disability
- Predictors of worse outcomes (e.g. older age, pre-injury disability, other injuries and compensation)
- Use in improving management approach in acute and post-discharge settings

References