FRAILTY: A NEW PARADIGM FOR ELDERLY TRAUMA

ECI SYMPOSIUM
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PARADIGM (SHIFT)

• A theory or a group of ideas about how something should be done, made, or thought about

www.merriam-webster.com/dictionary/paradigm
FALLS
MOTOR VEHICLE CRASHES

2\textsuperscript{nd} Leading cause of injury in trauma patients > 75 Years
- Nationwide and at RMH

You got a problem with my driving, punk?
ISSUES

• Increasing numbers elderly as % population
• Multiple co-morbidities
• Finite resources / cost
• Ethical considerations
• Manage patient / family expectations
• Do we need a paradigm shift ?
WHAT IS “FRAILTY”

• A state of vulnerability to minor homeostatic stressors due to an age-related decline in physiological reserve

• Frail people are at greater risk of adverse outcomes
  • Falls, increasing disability, hospitalisation, transfer to higher level of care, and mortality

• Considerable **heterogeneity**

Freid et al J Gerontology 2001
Joyce et al Current Opin Anaesth 2015
AGING AND FRAILTY

- By 2050, the proportion of the global population aged > 64 years is projected to reach 20%.
- The estimated average prevalence of frailty among older people in the community is 10%.
  - Range of 4–59% due to variability in definition used and studied population.

Collard *et al.*, 2012.
Proportion of the population aged 65 and over

- 1970
- 1990
- 2010
- 2030
- 2050

- Per cent

- 65-84
- 85 and over
AUSTRALIAN GOVT INTERGENERATIONAL REPORT 2015

• Age 65-84 yrs
  ▪ 2014-15: 3.1 million (13% pop)
  ▪ 2054-55: 7 million (18% pop)

• Age > 84 yrs
  ▪ 2014-15: 500,000 (2%)
  ▪ 2054-55: 2 million (5%)

▪ Av Life expectancy (yrs) if born in 2054-5
  ▪ 95.1 men / 96.6 for women
  ▪ 40,000 people > 100 yrs (122 only today)

AUSTRALIAN TRAUMA REGISTRY DATA 2010-2012

• Total injuries ISS > 12 or died: 20,435
• Total deaths: 2051 (10%)

Deaths due to injury in elderly
• 65-74 yrs : 16%
• 75-84 yrs : 23%
• > 85 yrs : 28%

Caring for the Severely injured in Australia. AusTQIP 2014
2009-10

- Injury → 10,668 deaths (7.6% total deaths)
  - 1/3 Male deaths > 64 yrs
  - 2/3 female deaths > 64 yrs

- Cause of deaths
  - Falls (32%)
  - Intentional self harm (21%)
  - Transport related (14%)
<table>
<thead>
<tr>
<th>Age group</th>
<th>No injured (%)</th>
<th>Case fatality rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69</td>
<td>191 (6%)</td>
<td>7.9%</td>
</tr>
<tr>
<td>70-74</td>
<td>194 (6%)</td>
<td>15.5%</td>
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<tr>
<td>75-79</td>
<td>210 (7%)</td>
<td>20.5 %</td>
</tr>
<tr>
<td>80-84</td>
<td>199 (6%)</td>
<td>21.6%</td>
</tr>
<tr>
<td>85 and over</td>
<td>345 (11%)</td>
<td>34.5%</td>
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### RNSH AGE COMPARISON 2013 (672 TRAUMA ADMISSIONS)

<table>
<thead>
<tr>
<th></th>
<th>Age &gt; 64</th>
<th>Age &lt; 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>286 (43%)</td>
<td>386 (57%)</td>
</tr>
<tr>
<td>M:F</td>
<td>56: 44 %</td>
<td>78: 22 %</td>
</tr>
<tr>
<td>Av Age (yrs)</td>
<td>79</td>
<td>38</td>
</tr>
<tr>
<td>Av ISS</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>ICU Admit</td>
<td>58%</td>
<td>64%</td>
</tr>
<tr>
<td>Fall</td>
<td>78% (224)</td>
<td>30%</td>
</tr>
<tr>
<td>Road trauma</td>
<td>15%</td>
<td>44%</td>
</tr>
<tr>
<td>Av LOS (days)</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>Died</td>
<td>23 %</td>
<td>7 %</td>
</tr>
</tbody>
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RNSH ELDERLY TRAUMA 2013

• Increasing no. and increasing age
  • 92/286 (32%) > 84 yrs
• Multiple medical co-morbidities
• Discharge destination:
  • 45% Rehab / N.Home
  • 32% Home
  • 23% Died
CAN WE PREDICT OUTCOMES IN ELDERLY TRAUMA?

- Age
- ISS
- Comorbidities
  - All NOT predictive (except head injury)

Duvall et al J Pall Med 2015
Predictors of mortality in geriatric trauma patients: A systematic review and meta-analysis

Ammar Hashmi, MD, Irada Ibrahim-Zada, MD, PhD, Peter Rhee, MD, Hassan Aziz, MD, Mindy J. Fain, MD, Randall S. Friese, MD, and Bellal Joseph, MD, Tucson, Arizona

- Overall mortality (15%) in injured geriatric trauma patients > among adult trauma population (6.5% in 18-64 yrs)
- Patients > 74 yrs at higher risk of dying than 65-74 yrs
- Trauma mortality remains same after 74 yrs
- Severe injury ISS > 15, Mortality rate 26.5% (Odds ratio 9.5)
- Extremely severe ISS > 24, OR death 52.34% (98.1% probability)
- Low SBP OR 2.16 for mortality

J Trauma Acute care Surgery 2014
HEAD INJURY IN THE ELDERLY

• All Head injuries have worse outcomes
  • Assoc with higher ISS
  • Lower GCS
  • Anticoagulation Rx

• One study mod-severe brain injury
  • Overall in-hosp mortality 30%
  • Any pt with GCS < 9 – mortality 80%

Utomo et al Injury 2011
HOW TO ASSESS FRAILTY?
AND IS IT PREDICTIVE OF OUTCOME AFTER INJURY?
REPORTED EDMONTON FRAIL SCALE
Hilmer  Aust J Aging 2009

<table>
<thead>
<tr>
<th>Cognition</th>
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</thead>
<tbody>
<tr>
<td>General Health Status</td>
</tr>
<tr>
<td>Functional independence</td>
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<tr>
<td>Social support</td>
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<tr>
<td>Medication use</td>
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<tr>
<td>Nutrition</td>
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<tr>
<td>Mood</td>
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<tr>
<td>Continence</td>
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<tr>
<td>Self reported performance</td>
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- Non frail: 0-7
- Frail: 8-18
A PROSPECTIVE COHORT STUDY EXAMINING THE PREVALENCE AND IMPLICATIONS OF FRAILTY IN OLDER SURGICAL INPATIENTS

SIMONE CHEUNG
SYDNEY MEDICAL SCHOOL
2015
UNPUBLISHED
100 patients admitted to RNSH surgical services

- 33% Frail
  - In hospital
  - Increased falls
  - At 3/12
  - Transfer to a high level NH facility
  - Falls post-discharge
  - ADL disability

- No relationship between frailty and hospital readmission, confusion or death
FRAILTY INDEX IN ELDERLY TRAUMA PATIENTS

• Frailty index FI (50 pre-admission variables)
  • Co-morbidities (IHD)
  • Daily activities (shopping)
  • Health attitude (lonely)
  • Function (exercise)
  • Nutrition (recent wt loss)

Joseph et al. J Trauma ACS 2013
Joseph et al. JAMA Surg 2014
FRAILTY INDEX

• High FI = Worse outcome
  • > 0.25
• Increased susceptibility to disability due to
  • Physical loss
  • Cognitive impairment
  • Social isolation
  • Psychological distress

Searle et al BMC Geriatric 2008
OUTCOMES

• In-hospital complications
  • Cardiac, lung, infections, renal, re-operate

• Adverse D/C
  • NH or death
Favourable v Unfavourable Outcome
250 pts over 24 months

• Favourable Outcome (FO)
  • Mean Frailty Index 0.19
  • D/C to Home or Rehab facility

• Unfavourable Outcome (UFO)
  • Mean Frailty Index 0.30
  • D/C to Skilled Nursing Facility (NH) or Death
RESULTS

- 110 (44%) FI > 0.25
  - Higher in-hospital complications (OR 2.5)
  - Adverse D/C disposition (OR 1.6)

- High FI independent predictor of unfavourable outcome

- Age, ISS, GCS, Head AIS score
  - NOT assoc with discharge disposition
FRAIL OLDER PATIENTS AFTER INJURY

• Increased LOS
• Increased adverse events
• Increased costs

• Frailty Assessment allows:
  • Better prediction of potential outcome
  • Informed communication with family
  • Better allocation of resources
ELDERLY TRAUMA LOAD WILL INCREASE AND WE NEED A PLAN

- WILL REQUIRE AN EVIDENCE-BASED APPROACH
- CURRENT “ALL TREATMENT” OPTIONS NOT SUSTAINABLE
- MORE AUSTRALASIAN DATA REQUIRED
A WAY FORWARD

• Early Frailty Assessment for all elderly patients
  • Allows realistic and appropriate care
  • Early discussion with family re goals of care
  • Assist with discharge planning
  • End of life issues
  • Mod- severe Head Injury bad outcome
  • Avoid ICU if high FI due to likely poor outcome
“The necessity of nature’s final victory was expected and accepted in generations before our own. Doctors were far more willing to recognise the signs of defeat and far less arrogant about denying them.”

Sherwin Nuland “How we die”

In Atul Gawande’s Being Mortal
SURVIVE INJURY TO LIVE A PRODUCTIVE AND INDEPENDENT OLD AGE?
KEEP FIT AND ACTIVE
THANK YOU