Frailty in Renal Populations

Renal Association

Dr Andrew Nixon
Clinical Research Fellow in Renal Medicine
Lancashire Teaching Hospitals NHS Foundation Trust
University of Manchester
Outline

• What is Frailty?
• Why is Frailty Important for Renal Medicine?
• What Can Renal Services Do to Improve Outcomes for Patients Living with Frailty and CKD?
What is Frailty?
Population Ageing

UK population has been steadily getting older and this trend is projected to continue in the future:

- In 2016 11.8 million aged ≥65 years (18%)
- By 2066 estimated 20.4 million aged ≥65 years (26%)
- Fastest increase will be seen in ≥85 year age group (1.6 → 5.1 million)

Figure 2: Population by age group, selected years, UK

ONS Aug 2018
What is Frailty?

Complex mechanisms of ageing promote cumulative decline in multiple physiological systems with consequent erosion of homeostatic reserve

State of increased vulnerability to disproportionate changes in health status when exposed to relatively minor stressor events

Figure 1: Vulnerability of frail elderly people to a sudden change in health status after a minor illness

In recent years there have been efforts to create an operationalized definition of frailty to aid in its diagnosis and to categorize its severity.

Consensus group agreed that ‘physical frailty is an important medical syndrome...that can potentially be prevented or treated with specific modalities’
Overlapping Concepts

- Frailty is an independent concept, distinct from comorbidity and disability
- Overlap is more frequent and increases with worsening frailty
- Adjusted Hazard Ratios (HR) For Mortality Estimated Over 3 Years:
  - Pre-frailty: 1.49 (95% CI 1.11-1.99)
  - Frailty: 2.24 (95% CI 1.51-3.33)
Why is Frailty Important for Renal Medicine?
Ageing Renal Population

Fig. 2.1. RRT prevalence pmp by age group and UK country on 31/12/2016
Pathophysiological processes inherent to CKD appear to hasten the decline from fitness to frailty

Frailty prevalence:
- Older adult population: 11%
- CKD G5D: >60%
## Outcomes in Patients Living with Frailty and CKD

<table>
<thead>
<tr>
<th>Study</th>
<th>Type</th>
<th>Sample Size</th>
<th>Follow-up</th>
<th>Event</th>
<th>Adjusted Hazard Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roshanravan et al, 2012</strong></td>
<td>Death or Requiring Dialysis</td>
<td>CKD G1-4, n=336, Median F/U 2.6 yrs</td>
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<td>2.5 (1.4-4.4)</td>
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<tr>
<td><strong>Bao et al, 2012</strong></td>
<td>Death, Hospitalisation</td>
<td>Dialysis Initiation, n=1576, Median F/U 2.9 yrs</td>
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<td>1.57 (1.25-1.97)</td>
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<td>1.26 (1.09-1.45)</td>
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<tr>
<td><strong>McAdams-DeMarco et al, 2013</strong></td>
<td>Death</td>
<td>Chronic HD, n=146, Median F/U 3 yrs</td>
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<td>2.60 (1.04-6.49)</td>
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<td>1.43 (1.00-2.03)</td>
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<td>3yr Mortality:</td>
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<td></td>
<td>Non-frail 16%, Pre-frail 34%, Frail 40%</td>
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<td><strong>Johansen et al, 2007</strong></td>
<td>Death, Hospitalisation</td>
<td>Chronic HD, n=2275, F/U 1 yr</td>
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<td>2.24 (1.60–3.15)</td>
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<td></td>
<td>1.63 (1.41–1.87)</td>
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<tr>
<td><strong>McAdams-DeMarco et al, 2015</strong></td>
<td>Death</td>
<td>KT, n=537, Median F/U 2.7 yrs</td>
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<td>2.17 (1.01-4.65)</td>
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<td>5yr survival:</td>
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<td></td>
<td>Non-frail 92%, Pre-frail 86%, Frail 78%</td>
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</tbody>
</table>
Frailty is independently associated with worse health-related quality of life in patients with CKD G4-5D

- Adjusted for age, gender, dialysis-dependence and comorbidity

- Frailty is associated with at least a 20 point lower score in 5 of the 8 SF-36 domains: physical functioning, role limitations due to emotional problems, energy/fatigue, social functioning and pain
Frailty Trajectory with RRT

Kurella Tamura et al, 2009
- Elderly nursing home residents (n=3702)
- Dialysis associated with sustained decline in functional ability

Johansen et al, 2017
- Prevalent dialysis patients (n=762)
- Substantial year to year variability in frailty scores
- Approx. equal numbers of patients improving and worsening

McAdams-DeMarco et al, 2015
- Kidney transplantation (n=349)
- Frailty initially worsens but then improves by 3 months

### Table 2. Change in Frailty State Between Kidney Transplantation (KT) and 3 Months After KT

<table>
<thead>
<tr>
<th>At Time of KT</th>
<th>Nonfrail</th>
<th>Intermediately Frail</th>
<th>Frail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonfrail</td>
<td>66.7</td>
<td>21.6</td>
<td>11.7</td>
</tr>
<tr>
<td>Intermediately frail</td>
<td>52.0</td>
<td>28.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Frail</td>
<td>33.4</td>
<td>40.7</td>
<td>25.9</td>
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</tbody>
</table>

Nonfrail was defined as a score of 0 or 1, intermediate frailty was defined as a score of 2, and frailty was defined as a score of 3–5. The table displays the percentage of KT recipients who were nonfrail, intermediately frail, and frail 3 months after KT according to frailty status at the time of KT.
What Can Renal Services Do to Improve Outcomes for Patients Living with Frailty and CKD?
Frailty Identification

• Identifying frailty is the first step in improving outcomes for this vulnerable group

• Perceived frailty is an inadequate proxy for measured frailty
  • 34% perceived as frail among non-frail participants
  • Older adults more likely to be misclassified as frail

• Frailty Phenotype is a time-demanding assessment

• Need for an efficient, sensitive and discriminative outpatient frailty screening method in the CKD population
Diagnostic Accuracy of Frailty Screening Methods in Advanced Chronic Kidney Disease

Andrew C. Nixon\textsuperscript{a-c} Theodoros M. Bampouras\textsuperscript{d,h} Neil Pendleton\textsuperscript{e} Sandip Mitra\textsuperscript{f,g} Ajay P. Dhaygude\textsuperscript{a}

\textbf{Primary Objective:} to evaluate the diagnostic accuracy of several proposed frailty screening methods in patients with CKD G4-5 and those established on haemodialysis (G5D) against the reference standard, the Frailty Phenotype.
Frailty Screening

- Walking speed is a very useful frailty screening measure in patients with advanced CKD
- Clinical Frailty Scale most accurate non-physical assessment frailty screening method
- Each point increase in CFS score is associated with an increased mortality risk in patients referred for pre-dialysis education and in patients commencing dialysis

<table>
<thead>
<tr>
<th>Method</th>
<th>Correlation coefficient (95% CI)</th>
<th>p value</th>
<th>AUC (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Frailty Scale</td>
<td>0.77 (0.66 to 0.85)</td>
<td>&lt;0.001</td>
<td>0.90 (0.84–0.97)</td>
<td>&lt;0.001</td>
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<tr>
<td>PRISMA-7</td>
<td>0.64 (0.50 to 0.75)</td>
<td>&lt;0.001</td>
<td>0.83 (0.73–0.93)</td>
<td>&lt;0.001</td>
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<tr>
<td>CKD FI</td>
<td>0.75 (0.65 to 0.81)</td>
<td>&lt;0.001</td>
<td>0.88 (0.81–0.96)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CKD FI-LAB*</td>
<td>0.26 (0.05 to 0.46)</td>
<td>0.02</td>
<td>0.63 (0.50–0.77)</td>
<td>0.08</td>
</tr>
<tr>
<td>Walking speed</td>
<td>0.70 (0.55 to 0.80)</td>
<td>&lt;0.001</td>
<td>0.97 (0.93–1.00)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hand grip strength</td>
<td>−0.62 (−0.73 to −0.48)</td>
<td>&lt;0.001</td>
<td>0.87 (0.78–0.96)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>SPPB</td>
<td>−0.66 (−0.78 to −0.51)</td>
<td>&lt;0.001</td>
<td>0.92 (0.86–0.97)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Clinical Frailty Scale*

1. **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2. **Well** – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.

3. **Managing Well** – People whose medical problems are well controlled, but are not regularly active beyond routine walking.

4. **Vulnerable** – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “slowed up”, and/or being tired during the day.

5. **Mildly Frail** – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6. **Moderately Frail** – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

7. **Severely Frail** – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8. **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9. **Terminally Ill** - Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common symptoms in mild dementia include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In moderate dementia, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In severe dementia, they cannot do personal care without help.

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Specialised Clinical Frailty Network

• Collaborative improvement programme delivered by NHS England in partnership with NHS Elect

• The aim of the programme is to improve NHS specialised services for older people living with frailty

• Network delivers a programme of support framed around frailty assessment that will help inform a clinically appropriate and holistic response to meet patient needs

• Renal Sites:
  – Lancashire Teaching Hospitals NHS Foundation Trust
  – King’s College Hospital NHS Foundation Trust
  – Leeds Teaching Hospitals NHS Trust
  – Nottingham University Hospitals NHS Trust
  – University Hospitals Birmingham NHS Foundation Trust
Our Aim

1. To identify patients living with frailty and CKD

2. To assess and support patients living with frailty and CKD to maximise patient-reported outcomes and minimise unplanned care episodes
Comprehensive Geriatric Assessment

- Accepted gold standard for caring for frail older people
- ‘A multidimensional, multidisciplinary process which identifies medical, social, and functional needs and the development of a coordinated care plan to meet those needs’
- Older patients are more likely to be alive and in their own homes at follow-up
Click the link below to watch the video

https://biteable.com/watch/lthtr-renal-frailty-team-2169071
Progress So Far

- Introduced a systematic frailty screening programme
- Established a multi-disciplinary Renal Frailty Team
- Using the principles of the CGA, offer patients a home assessment (modified CGA) by an Occupational Therapist
- Introduced monthly Renal Frailty MDT meetings
  - Discuss the medical, nursing, psychological, functional and social needs
  - Discuss renal-specific interventions
  - Consider the appropriateness of advance care planning
  - Generate problem list and targeted management plan

Renal Frailty Team

Addressing problems together today before they become bigger problems tomorrow

We are accepting referrals from all areas of the renal service, including on discharge from ward 25!

Referral Criteria:
1. Clinical Frailty Scale score 5 or more OR Clinical Frailty Scale score <5 and concerns about mobility, cognition or nutritional status.
2. CKD, including patients receiving dialysis or who have received a transplant.
3. Living in Preston or Chorley Area.

If you wish to refer a patient for a home-based assessment, please send an email to renal.frailtyteam@lthtr.nhs.uk detailing the Clinical Frailty Scale score and any specific concerns.

We would be grateful if you could inform patients of your intention to refer for a home-based assessment and request their permission to do so.
Table 2. Approach to the management of frail patients with CKD

Practice points
1. Holistic assessment and targeted management strategy, including:
   - Treatment of symptomatic medical conditions
   - Medication review
   - Falls prevention measures
   - Anticipatory care planning
2. Nutrition
   - Consider causes of reduced appetite
   - Dietetic assessment and dietary advice focused on maintaining nutritional status
3. Timely care of complications of CKD
   - Metabolic acidosis
   - Fluid overload
   - Uraemia
4. Individualized exercise training programme
5. Shared decision with the patient regarding the appropriateness of renal replacement therapy
Summary

• Frailty is a state of increased vulnerability

• Prevalence of frailty increases substantially as kidney function declines

• Frailty is an independent predictor of adverse outcomes across all stages of CKD

• Identifying frailty is the first step in improving outcomes for this vulnerable group

• Recommend that Renal Services establish frailty screening programmes using an accurate yet practical frailty screening tool, such as the Clinical Frailty Scale

• Those screened as frail should be offered a holistic assessment so that a targeted management strategy can be implemented in an effort to improve outcomes
Acknowledgements

Participants
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