Pre-emptive rehabilitation to prevent dialysis-associated morbidity (PREHAB): A pilot study to assess the feasibility and impact of enhanced multidisciplinary care in patients approaching dialysis

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Outline

• Background to PREHAB
• Study aims and outcomes
• Study design and methodology
• Summary of baseline and follow up data
• Results: exercise capacity and muscle strength, parameters of nutritional status, functional capacity and quality of life
• Strengths and limitations of the pilot study
• Development of the study and plans for further work
• Conclusion
Chronic Kidney Disease is characterised by:

- Protein Energy Wasting (PEW)
- Muscle wasting
- Reduced physical functioning
- Fatigue
- Difficulty performing routine activities of daily living (ADL)
- Reduced quality of life
- Increased rates of hospitalisation and morbidity
- Depression
- Muscle wasting
- Reduced quality of life
- Increased rates of hospitalisation and morbidity
Impact of dialysis upon functional status of elderly adults

- Significant reduction in activities of daily living (ADL) approaching dialysis
- Rapid increase in dependency once dialysis starts

Patient perception of quality of life and functional capacity

A decline in quality of life and increased dependency appears to be prevalent in our progressive CKD population – as demonstrated by results from a questionnaire in 135 low clearance patients.

Problems with mobility

Patient perception of mood, lethargy and appetite

What is PREHAB?

• Previous studies have demonstrated the benefits of multidisciplinary care, but in patients with earlier CKD or upon commencing dialysis (Flesher et al, 2011; Li et al, 2007; Wingard et al, 2007)

• PREHAB is a focused multidisciplinary education and support programme commenced 3-6 months prior to dialysis initiation

• Involves an appropriately-skilled renal multidisciplinary team (MDT) working in a streamlined manner

• Developed through extensive engagement with the renal MDT:
  – patients
  – dietitian
  – exercise instructor
  – physiotherapist
  – occupational therapist
  – renal pharmacist
  – nursing staff
  – medical staff
Study aims and outcomes

• **Overall aim:** to determine the efficacy of a programme of streamlined multidisciplinary care in patients approaching dialysis

• **Primary outcome:** objective improvements in functional capacity as a result of increased muscle strength, improved exercise capacity, and improved nutritional status

• **Secondary outcome:** subjective improvement in quality of life through improved functional capacity, reduced muscle wasting and improved nutritional status
Study design

Objective Baseline Measurements:
- Hand Grip Strength (HGS)
- Mid arm circumference
- Incremental Shuttle Walk Test (ISWT)
- Sit to Stand 60 (STS 60)
- Single Repetition Max (SRM) Quads
- Bicep Single Repetition Maximum

MDT assessment at dialysis commencement

Dialysis baseline objective and subjective measures

Regular follow up and assessment
Objective and subjective follow-up measurements

-3-6 months
-2-4 months
-1-2 months
0-6 months
12 months
18 months

10 week exercise and multidisciplinary education programme

Individualised and group education to promote independence and optimal quality of life

Encourage minimal care or self-care on dialysis
Training for home haemodialysis

Pre-dialysis assessment:
- Dietary assessment
- Occupational Therapy assessment
- Medication review

Subjective baseline measurements:
- Appetite assessment
- Subjective Global Assessment (Nutritional Status)
- Duke Activity Status Index (DASI)
- Cognitive Assessment (MoCA)
- Fatigue Score

Fatigue and anxiety management
# Inclusion and Exclusion Criteria

## Inclusion
- Male and female aged >18 yrs
- eGFR 9-12mls/min
- Rate of change of eGFR indicates dialysis required in 3-6 months
- Attending low clearance clinic
- Opted for dialysis
- Ability to exercise

## Exclusion
- <18 years old
- Patient not predicted by eGFR to require dialysis within 6 months of study commencement
- Patient has chosen conservative care rather than dialysis
- Severe physical impairment and/or significant comorbidity making exercise impossible or unsafe
Baseline measurements

Sit to Stand (STS) 60

Single Repetition Max (SRM) Quads

Incremental Shuttle Walk Test (ISWT)

Dietary assessment

Handgrip
PREHAB: a 10 week exercise and education programme

Exercise circuit
PREHAB: educational programme

Educational Programme Content

• What the kidneys do
• Exercise
• Medication and lifestyle
• Diet
• Exercise follow up
• Fatigue management
• Meet current dialysis patients
• Dialysis unit visit
• Anxiety management
• Review and summary session
Pilot study - patient recruitment

47 patients met inclusion criteria

30 participants

8 withdrew:
(4 commenced RRT earlier than planned)

22 completed

12 male, 10 female
Mean age 61.9yrs (range 41-77)
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<td>7</td>
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<td>ISWT (m)</td>
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<td>70</td>
<td>920</td>
<td>385</td>
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<td>36</td>
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Results – exercise capacity, muscle strength and endurance

Percentage increase in ISWT, STS 60 and SRM Quads

Mean increase in ISWT distance (55m) is clinically significant (≥ 47.5m)
Results - parameters of nutritional status

1. Changes in Handgrip Strength (HGS)

Mean increase: 0.8kg (2.4%)
Results – parameters of nutritional status

2. Nutritional status as determined by Subjective Global Assessment (SGA)
Results – functional status and quality of life

• Dukes Activity Status Index (DASI) score was maintained or increased in 18/22 (82%) patients
  – mean score increased by 2.2 (6.9%)

• No change in mean Hospital Anxiety and Depression Scale (HADS) anxiety score over the 10 weeks
  – only 3 patients had HADS anxiety score ≥8 (denotes anxiety)

• Slight increase in mean HADS depression score over the 10 weeks
  – 1 patient had HADS depression score ≥8 (denotes depression)
Subjective measures of patient experience and evaluation

• Focus group

• Detailed questionnaire

• Common themes were that patients:
  – felt more informed about their condition
  – felt more reassured
  – were encouraged
  – had increased confidence (particularly to exercise)
  – had more stamina
  – were more motivated to exercise
## Study strengths and limitations

### Strengths

- Novel concept
  - Reconfiguration of current MDT services
  - No increase in resources
- Patient focussed
  - Extensive patient engagement
- MDT approach
- Pre-cursor to further research

### Limitations

- Pilot study
- Small sample size
  - Results not statistically significant
- Difficulty estimating when dialysis required
- Motivated patients agree to participate
  - Greater independence
- Non-comparative
  - Observational
Development and future work

• **Study re-design**
  – to ensure use of appropriate validated and evidence-based assessment methods
  – some assessment methods altered

• **Ongoing work:**
  – on-going follow-up once patients commence dialysis to determine if the programme positively influences patient outcomes and quality of life

  – randomised trial comparing enhanced care (PREHAB) with conventional patient care
    • BKPA/BRS Research Grant
    • REC approval received
Conclusion

• This was a successful pilot study which has demonstrated the feasibility and effectiveness of an education and exercise programme in patients approaching dialysis within existing staffing resources

• The programme has resulted in maintained and often improved exercise tolerance, muscle function and nutritional status

• The programme has had a positive effect upon patient confidence
Acknowledgements

• The patients
• Prof Maarten Taal
• Dr Lindsay Chesterton
• Dr Richard Fluck
• Prof Chris McIntyre
• Irene Speelman
• Jo Hamilton
• Gillian von Fragstein
• Sue Shaw
• Diane Taal
• Sr Georgina Chandler
• Sr Carol Rhodes
• Chris Swan
• Sally Hinchliffe