Cardiac Function in Cancer-Related Fatigue

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Background
- Cancer-Related Fatigue (CRF) is a common, high-impact symptom
- Pathophysiology poorly understood
- Hypothesis: Cardiac dysfunction contributes to CRF
- Myocardial strain is a sensitive method of measuring left ventricular (LV) function

Aim
Investigate CRF and cardiac function in solid tumours

Methods
- Prospective observational study
- Inclusion criteria: Consecutive, treatment naïve, oncology outpatients
- Exclusion criteria: previous cancer, known cardiovascular disease
- Participants identified as ‘fatigued’ based on brief fatigue inventory (BFI) score of ≥3

Outcome Measures

FATIGUE
- BFI
- Hand grip strength
- Timed Up and Go (TUG)
- Sit to Stand (STS)

CARDIAC FUNCTION
- 2D echo:
  - Systolic function: LV ejection fraction (LVEF)
  - Diastolic function: Mitral valve E/A ratio; Isovolumic Relaxation Time (IVRT)
  - Myocardial strain
- Cardiac biomarker: NT-BNP

Results
N=42; 30♀
Age: Median 57 (range 38-82)
Cancer type:
  - Breast 28
  - Oesophageal 13
  - Prostate 1
Loco-regional disease: 25
BFI: Median 1.7 (range 0-7.7)
BFI ≥3: 14/42 (33%)

<table>
<thead>
<tr>
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<th>Fatigued (range) N=14</th>
<th>Non-Fatigued (range) N=28</th>
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<tbody>
<tr>
<td>Grip strength (kg force)</td>
<td>21 (7-33)</td>
<td>24 (13-48)</td>
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<td>TUG (s)</td>
<td>8 (6-12)</td>
<td>7 (5-10)</td>
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<td>STS (number in 30s)</td>
<td>13 (6-16)</td>
<td>14 (8-25)</td>
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<td>LVEF (% , normal ≥55)</td>
<td>68 (63-80)</td>
<td>69 (56-84)</td>
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<td>Mitral valve E/A (ratio, normal &gt;1)</td>
<td>0.95 (0.3-1.8)</td>
<td>1.2 (0.7-2.1)</td>
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<td>IVRT (ms, normal 80±12)</td>
<td>98 (88-133)</td>
<td>107 (70-124)</td>
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<td>Global longitudinal strain (% , normal 16-22)</td>
<td>18 (16-24)</td>
<td>19 (15-25)</td>
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<td>NT-BNP (ng/L, normal &lt;300)</td>
<td>26 (8-66)</td>
<td>40 (6-354)</td>
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Conclusions
- High proportion fatigued pre-treatment
- Indicators of diastolic dysfunction present:
  - E/A ratio reduced in fatigued participants
  - Prolonged IVRT in both groups
- No difference in myocardial strain levels between groups

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