The Dizziness Study: a Randomised-Controlled Trial

Jasmine Menant
NSW Falls Prevention Network Forum
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Vertigo
Vestibular
Dizziness
Disequilibrium
Sensorimotor
Cardiovascular
Psychogenic
Anxiety

Dizziness
Dizziness

- Reported in 10% -30% of community-dwelling older people & prevalence increases with advancing age
- Independent risk factor for falls in older people
- Associated with reduced quality of life
- Often multifactorial which makes differential diagnosis difficult
Aims of the study

- Improve the diagnosis for dizziness in older people with a multidisciplinary assessment

- Assess the effectiveness of a tailored multifaceted dizziness intervention using a randomised controlled trial design

- Develop a multiple profile assessment for dizziness for use in Specialist Clinics
Participants

- N= 306 adults aged ≥50 years and over
  - 2+ dizziness episodes in past year & not currently treated for them
  - Independent living
  - Understanding English
  - No severe cognitive impairment (GP-cog>4)

Exclusion criteria

- Degenerative neurological condition (PD, MS, etc)
- Severe depressive symptoms, severe anxiety symptoms, other conditions that require urgent treatment (Suspected stroke; TIA; Acute cardiovascular condition)
Consensus panel meeting

Baseline

Comprehensive Baseline Assessment
CV, vestibular, mental health, sensorimotor, balance and gait

2 weeks

Consensus panel meeting

Randomisation

Concealed allocation

Control group

Intervention group

Multifaceted Tailored intervention

Blinded tester Re-assessment
CV, vestibular, mental health, sensorimotor, balance and gait

End of study

6 months Monthly falls and dizziness calendars

Participants’ report + recommendations to controls
Questionnaires

- Demographics
- Medical conditions
- Medications
- Physical activity
- Depression
- Anxiety
- Neuroticism
- Quality of life

- Dizziness –specific questionnaires
  - Triggers, symptoms frequency and duration *
  - Dizziness Handicap Inventory *: burden

“...I’ve torn up the questionnaire but am using the lovely pen you sent me...”

* RCT Primary outcome measures
Cardiovascular assessment

- Tilt-table test of Orthostatic hypotension (3min) / delayed (3min +)
  - Fall ≥20mmHg in SBP
  - And/or fall ≥10mmHg in DBP
  - Dizziness symptoms

- 12-lead ECG

- Lying and seated blood pressure
Sensorimotor and balance assessment

Physiological Profile Assessment (PPA): composite fall risk score

Dynamic stability

Choice-stepping reaction time *

Gait *

* RCT Primary outcome measures
Vestibular assessment

- Benign paroxysmal positional vertigo (BPPV)
- Vestibular hypofunction
- Central problem

Head impulse test

Dix-Hallpike test

Spontaneous, gaze-directed and head-shaking nystagmus in light and darkness
## Tailored Interventions

<table>
<thead>
<tr>
<th>Problem</th>
<th>Intervention</th>
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<tbody>
<tr>
<td>Poor balance / strength</td>
<td>Otago home exercise program with exercise physiologist</td>
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<tr>
<td>BPPV / vestibular hypofunction</td>
<td>Epley maneuver or vestibular rehabilitation with vestibular physiotherapist</td>
</tr>
<tr>
<td>Cardiovascular, Meds, Neuro...</td>
<td>POWH Falls Clinic / Geriatrician (medication review, blood pressure) or letter to GP</td>
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<tr>
<td>Severe Anxiety / Depression</td>
<td>8 weeks booklet based Cognitive-Behavioural Therapy with phone-based psychological support</td>
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Preliminary results: what is dizziness?

- “An earthquake inside me”
- “Electric shock”
- “I feel disconnected – like I am floating on a wharf”
- “Like an elephant sitting on my head”
- “Feeling of “woo!””
- “Electric blue jagged lines and multi-coloured rectangles”
- “Frostbite in the brain – only happens in winter”
Older dizzy participants' characteristics

<table>
<thead>
<tr>
<th>Variables (n (%) or mean (SD))</th>
<th>≥65 years (n=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>72.3 (6.3)</td>
</tr>
<tr>
<td>Multiple fallers (past 12 months)</td>
<td>34 (17%)</td>
</tr>
<tr>
<td>History of head injury</td>
<td>25 (12.5%)</td>
</tr>
<tr>
<td>Taking 4 or more medications</td>
<td>89 (44.5%)</td>
</tr>
<tr>
<td>Transient Ischemic Attack / stroke</td>
<td>19 (9.5%)</td>
</tr>
<tr>
<td>Self-reported neck / back pain</td>
<td>138 (69%)</td>
</tr>
<tr>
<td>Unexplained collapses</td>
<td>21 (10.5%)</td>
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Number of recommended therapies

- Reflects on contributing factors
# therapies associations with fall risk factors

<table>
<thead>
<tr>
<th>Mean (SD) or N (%)</th>
<th>None or single therapy (n=111)</th>
<th>Multiple therapies (n=88)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>70.4 (5.0)</td>
<td>74.8 (7.0)</td>
</tr>
<tr>
<td>Sway foam EC (mm²)</td>
<td>376.0 (152.1)</td>
<td>493.4 (193.8)</td>
</tr>
<tr>
<td>Coordinated stability</td>
<td>4.3 (6.5)</td>
<td>11.7 (10.5)</td>
</tr>
<tr>
<td>PPA score (falls risk)</td>
<td>-0.11 (0.69)</td>
<td>0.86 (1.12)</td>
</tr>
<tr>
<td>Gait speed (cm/s)</td>
<td>122 (19)</td>
<td>108 (24)</td>
</tr>
<tr>
<td>Choice-stepper time (ms)</td>
<td>1063 (181)</td>
<td>1170 (216)</td>
</tr>
<tr>
<td>Dizziness impact score</td>
<td>19 (15)</td>
<td>31 (20)</td>
</tr>
<tr>
<td>4+ meds</td>
<td>40 (36%)</td>
<td>49 (56%)</td>
</tr>
<tr>
<td>Multiple faller (past 12m)</td>
<td>12 (11%)</td>
<td>22 (25%)</td>
</tr>
</tbody>
</table>

All significant differences even after controlling for age
Multiple contributing factors to dizziness

- Migraine: 40%
- BPPV: 30%
- Hypofunction: 15%
- Vestibular: 10%
- Poor balance/strength: 20%
- Severe anxiety/depression: 5%
- Other: 30%
- Heart: 10%
- Meds: 5%
- Other: 20%
- OH: 10%
- Unknown: 20%
Dominant individual profiles of dizziness

- Anyone Vestibular
- Severe depression /anxiety
- Others -mostly Cardiovascular
- Unknown

Total of 100%
Dizziness handicap inventory (0-100)

- >39 : moderate disability

* Sign different from all other groups (p<0.05)
# Sign different from unknown group (p<0.05)
Associations with balance, fall risk & mobility

-0.2
0.3
0.8
1.3
1.8

Costab (0.1 score)  PPA fall risk score  Gait speed (m/s)

* Sign different from all other groups (p<0.05)
# Sign different from unknown group (p<0.05)
Multiple fallers

Significantly different between groups, p<0.05
Conclusions: cross-sectional preliminary results

- Multifactorial causes of dizziness might increase risk of falls in older people.

- Older people with anxiety / depression–related dizziness appear to be at significantly greater risk of falling than those with dizziness from other causes.

- Older people with vestibular-related dizziness do not seem to perform worse than those with dizziness from other causes on balance and mobility tests possibly due to the intermittent and situation-specific nature of the condition.
Challenges ... Next steps...

- Approximately 60 participants to re-assess post-intervention

- Need to prevent loss to follow-up for controls and participants living out of Sydney

- End of study December 2015: RCT results
Acknowledgements

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