
**eAppendix. Clinical Measures and Interventions**

This supplementary material has been provided by the authors to give readers additional information about their work.
Recruitment

Our initial protocol anticipated inviting a random sample in patient-spouse dyads of patients enrolled in the AD drug reimbursement program. However, the number of those in the register was less than we anticipated. Therefore, all dyads in the register were invited in order to obtain a sufficient sample size.

Clinical measures

At the baseline, participants’ demographic data (age, sex, education) were recorded, and medical diagnoses and prescription drug use details were confirmed from medical records for both the patients with Alzheimer disease and their spouses. The Charlson comorbidity index\(^1\) was calculated to assess the severity of disease burden. The dementia stage in the patients was assessed using the Clinical Dementia Rating Scale (CDR)\(^2\); the Mini-Mental State Examination (MMSE)\(^3\) served to test cognitive functioning, and the Mini-Nutritional Assessment (MNA) to grade nutritional status.\(^4\)

Primary outcome measures were patients’ physical functioning (evaluated using the Functional Independence Measure [FIM]\(^5\) ), and mobility (assessed with the Short Physical Performance Battery [SPPB]\(^6\)). Originally we planned to use the Barthel index, but we found it insensitive to change and instead used the FIM. The FIM has been influenced by the Barthel index,\(^7\) and it includes 18 categories, 13 that test physical functioning and 5 that evaluate cognitive capacity; total scores range from 18 (worst) to 126 (best). The SPPB includes balance tests, repeated chair stand tests, and a walking speed test, each scored from 0 to 4 points (total range, 0-12).\(^6\) Both the FIM and the SPPB are well-validated and widely used tests among older individuals.\(^6,7\)
Description of intervention

The participants randomized into the active intervention groups were assessed by a geriatrician to ensure patient safety during the exercise intervention.

**Home-based exercise program**: The participants in the home-based exercise group performed individually tailored physical exercise for 1 hour twice a week for a 12-month period (2008-2009 and 2009-2010). Each session was supervised by a physiotherapist specialized in working with patients who have dementia. The exercises were based on individual assessment and the goals were set together with the patients and their spousal caregivers. Exercise was goal oriented, individually tailored training during the home visits, addressing the patient’s individual needs and problems in daily functioning or mobility. The exercise could include climbing stairs, balance training, transfer training, walking, dual tasking, and outdoor activities. Various kinds of equipment were used to enhance the training, such as exercise and/or restorator bikes, ankle or hand weights, balls, canes, and balance pillows, depending on potential benefits. The spousal caregivers could participate in the sessions or they could use the time for their own activities. The patients continued exercising with the physiotherapists even during hospitalizations or respite care. However, if a patient was admitted into permanent institutional care, the intervention and further study assessments were discontinued.

**Group-based exercise program**: Physical exercise in this group was occurred during 4-hour visits in daycare centers twice a week for a 12-month period. The sessions were organized in groups of 10 participants and supervised by 2 physiotherapists specialized in dementia. The predetermined exercise program (Table) consisted of endurance, balance, and strength training, as well as exercises for improving executive functioning. Door-to-door taxi service and lunches were provided.

Strength training was organized at a gym using special equipment and tailored, increasing exercise intensity and strength. For example, with a leg press machine, participants achieved a mean increase in machine weight during the intervention year of 56% for men (from a mean of 39.3 kg [range, 10-90 kg] at baseline to 62.0 kg [22-130 kg] at 12 months) and 74% for women (from a mean of 31.3 kg
[range, 5-50 kg] at baseline to 54.5 kg [30-80 kg] at 12 months). Comparable figures for the hip abduction machine were 79% for men (from a mean of 18.2 kg [range, 5-50 kg] at baseline to 32.6 kg [15-65 kg] at 12 months) and 81% for women (from a mean of 18.0 kg [range, 0-30 kg] at baseline to 32.6 kg [7-45 kg] at 12 months). Endurance training was executed with exercise bikes. Balance training consisted of, for example, training to walk on a line, training with a bouncing ball, and climbing a ladder. Participants also practiced getting up from the floor. Executive functioning training included, for example, throwing a ball as accurately as possible, or doing 2 different functions with the left and right hands while counting numbers forward or backward at the same time. Music and sing-alongs were used to set the pace and support the exercises. Peer support was used to aid the training; for example, the group occasionally played games or had a dancing session. Because of lunch and coffee breaks and waits for gym equipment, the mean active exercise time per person was approximately 1 h/d.

The patients had taxi transportation arranged to their regular group sessions from respite care or the hospital. However, if a patient was admitted into permanent institutional care, the intervention and further study assessments were discontinued.

REFERENCES


**eTable. Group-Based Exercise Program**

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
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</thead>
<tbody>
<tr>
<td>10:00 to 11:00 AM</td>
<td>Taxi transportation from home to the daycare center</td>
</tr>
<tr>
<td>11:00 to 11:15 AM</td>
<td>Opening: grouping, getting to know each other, and warm-up</td>
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<tr>
<td>11:15 AM to 12:30 PM</td>
<td>Gym exercises, taking turns</td>
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<tr>
<td>12:30 to 1:15 PM</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:15 to 2:15 PM</td>
<td>Balance training and functional training, taking turns</td>
</tr>
<tr>
<td>2:15 to 2:45 PM</td>
<td>Rest and relaxation or executive functioning exercises</td>
</tr>
<tr>
<td>2:45 to 3:00 PM</td>
<td>Closing: discussing the experiences of the day (15 min)</td>
</tr>
<tr>
<td>3:00 to 4:00 PM</td>
<td>Taxi transportation to home</td>
</tr>
</tbody>
</table>