

The Effect of Resistance Exercise on the Cognitive Function, Depression and Instrumental Activities of Daily Living in People with Mild Dementia

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Synopsis

There is an increasing interest of physical exercise as a treatment strategy for managing people with dementia. The aim of this study is to evaluate the effect of resistance exercise on the cognitive function, depression and activities of daily living in people with mild dementia. Thirty participants from a day care center with mild Alzheimer's disease were randomly allocated to two groups: resistance exercise intervention and controls. The intervention took place three times/week for about 40 minutes, for 12 weeks. Exercise performed on main muscle groups at moderate intensity, while controls carried on their usual daily activities (no exercise). Cognitive function (Mini Mental State Examination - MMSE), depression (Geriatric Depression Scale-GDS-15) and activities of daily living (Instrumental Activities of Daily Living Scale-IADL) were evaluated in all participants twice. Repeated measures statistical analysis was performed with SPSS 22.0. The intervention group scored significantly higher than controls at second time point. IADL score significantly deteriorated at the second time point in controls. GDS-15 score was significantly increased in controls. MMSE score before intervention was significantly correlated to MMSE score after intervention. IADL score at second time point was positively and significantly related to MMSE. Intervention may have a significant positive influence on mental and daily living activities.

Key Words: Dementia, resistance exercise, daily living activities, depression.

Background

Dementia is a clinical syndrome characterized by impaired cognition functions, neuropsychiatric symptoms and gradual deterioration of physical function. In recent years, there is an increasing interest in the role of physical exercise as a treatment strategy for managing people with dementia [1-2].

Purpose

The aim was to evaluate the effect of resistance exercise on the cognitive function, depression and activities of daily living in people with mild dementia.



Methods

This is intervention study. Thirty participants from a day care center with mild Alzheimer's disease (Athens Alzheimer Association) were randomly allocated to two groups: one group resistance exercise intervention (n=15) and one control group (n=15).

Inclusion Criteria

a) age \geq 65 years old b) diagnosis of mild Alzheimer's dementia, as determined by the treating physician c) Mini-Mental State Examination (MMSE): 20-24 /30 d) ability to move to the intervention place e) existence of a caregiver f) sufficient hearing and vision g) medical consent to participate in the exercise h) absence of any other exercise program i) without medication change for at least 2 months j) ability of consent k) have already been considered as capable for consent from the treating physician and the treatment team.

Exclusion Criteria

a) other dementia type b) neurological disease with severe motor and cognitive problems c) serious diseases where is inappropriate participation in exercise, in consultation with the treating physician such as severe psychiatric illnesses, uncontrolled blood pressure severe cardiorespiratory problems, severe musculoskeletal problems d) malignancy e) recent surgery (<12 months) f) severe vision / hearing problems g) alcoholism h) drug use.

The intervention took place three times/week about for 40 minutes, for 12 weeks. Exercise included main muscle groups and was performed with ankle and wrist weights at moderate intensity and with a gradual increase of the load. Also, the intervention included warm-up and cool down lasting 5-10 minutes respectively, which will involve active exercises for the head, limbs, torso and stretching. The control group carried on their usual daily activities (no exercise). Cognitive function (Mini Mental State Examination - MMSE), depression (Geriatric Depression Scale-GDS-15) and activities of daily living (Instrumental Activities of Daily Living Scale-IADL) were evaluated in all participants twice, before and immediately after intervention by an independent neuropsychologist/psychologist and physiotherapist.

Assessment Tools

Mini Mental State Examination (MMSE)

MMSE is the most common assessment tool for diagnosing cognitive disorders. It is used by a large number of professionals and is a point of reference worldwide by both clinicians and researchers. It is also used in clinical practice as a diagnostic tool, in epidemiological studies, in clinical research to monitor the course of the disease, to study the effectiveness of therapeutic interventions, while its score is used as a criterion for inclusion in studies with patients with dementia and Alzheimer's disease (AD) [3-6].

Geriatric Depression Scale (GDS-15)

GDS-15 is a reliable and valid tool for assessing depression in the elderly as well as in patients with mild to moderate dementia [7-10].

Instrumental Activities of Daily Living Scale (IADL)

IADL is suitable for the evaluation of the complex activities of the daily life of the elderly. It is also a valid and reliable tool for evaluating functions, in both healthy elderly and elderly patients with dementia [11-14].

Analysis

Repeated measures with post hoc analysis, was performed with SPSS 22.0.

Results

The intervention group scored significantly higher than controls at second time point on MMSE score ($p < 0.001$). IADL score significantly deteriorated at the second time point in controls ($p < 0.001$). GDS-15 score was significantly increased in controls ($p < 0.05$). MMSE score before intervention was significantly correlated to MMSE score after intervention ($r = 0.762$, $p = 0.001$). IADL score at second time point was positively and significantly related to MMSE ($r = 0.686$, $p < 0.001$).

Conclusions and Implication

MMSE score were significantly improved within the intervention group, while GDS-15 and IADL were indicative of better performance in the intervention group. Intervention may have a significant positive influence on mental and daily living activities.

Competing Interests: The authors declare no conflict of interest.

Ethics Approval: The study approved by the Ethical Committee of the University of West Attica (96645-25/11/2020). All participants gave written consent.

Informed Consent: The statement of informed consent taken from the patient.

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