

Can a three weeks program in a rehabilitation center improve balance in elderly people?

A randomized clinical controlled trial

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Introduction

Balance is one of the primary risk factors for falls among the elderly. Balance exercise has shown to be the most important component of fall prevention for home-dwelling older people.

Less is known about possible effects of intensive balance exercise during a short period in a rehabilitation center.

Purpose

Primary objective:

To determine whether a balance training program, used complementary to a three weeks rehabilitation program in an inpatient setting may improve balance for elderly people.

Secondary objective:

Observe fall rates, fall related injuries and training habits.

Participants

174 persons (three groups), aged 65 and older (mean: 73.2; SD: 6.4).

Randomization:

Intervention Group (IG, N= 57) and Control Group (CG, N= 56): three weeks rehabilitation program.

Non-randomized:

Reference Group, (RG, N = 61): "home group": no rehabilitation program.

Methods

Programs:

IG and CG: Same "treatment as usual" three weeks program (treatments, training sessions). IG additionally followed a balance training program (OTAGO) with physiotherapist, in group-settings and self training
RG: nothing.

Instruments:

Falls Efficacy Scale-International (FES-I) at baseline (T1), after three weeks rehabilitation (T2), and after 3- (T3) and 6 months (T4). Timed Up and Go (TUG) and Sharpened Romberg: at T1 and T2 for IG and CG.

Results

No significant difference between groups was found (p=0.47), but FES-I and TUG improved in both IG (p<0,001) and CG (p=0,029). (Table 1). No significant group differences in fall rate and fall injuries during follow-up, but significant increase in mean training activity for IG and CG (p=0,027/0,002) at T3 compared to RG (p=0,016). (Table 2).

Discussion & Conclusions

- 1) Three weeks rehabilitation improved training habits and some aspects of balance in the elderly, but extra balance training did not improve balance more than standard rehabilitation.
- 2) Activities challenging for balance can benefit the elderly as much as specific balance exercises.
- 3) Balance training programs initiated during a stay in a rehabilitation center has to be followed up after discharge in order to sustain effects.

Recommendations

Balance improvement for the elderly is a long term project. Short periods of rehabilitation should focus on:

- 1) Motivating the elderly to activities that are challenging for balance rather than learning exercises for balance training at home.
- 2) Reducing risk factors for falls other than balance (e.g. strength).
- 3) Maybe training on fall techniques/school as a form of ADL training in order to increase confidence.

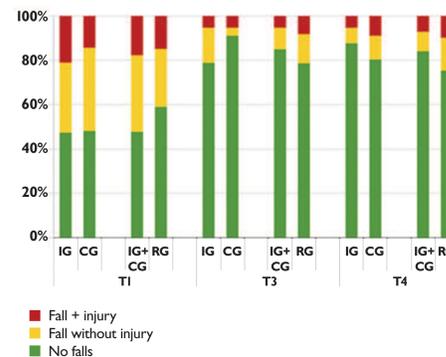
Purpose being to maintain ADL level, even those ADL exposing to fall risks.

Table 1. Effects of the 3 week intervention and sustainability of effects 3- and 6 months later

	T1				T2				T3				T4			
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (95% CI)	p-value	Within group effect size η^2	Mean (95% CI)	p-value	Within group effect size η^2	Mean (95% CI)	p-value	Within group effect size η^2	Mean (95% CI)	p-value	Within group effect size η^2
FES-I (7-28)																
IG	32.0 (9.3)	27.9 (8.2) **	26.5 (7.5) **	27.8 (8.4) *	0.8 (-1.4-3.0)		0.472	1.1 (-1.7-3.8)		0.446	0.5 (-2.1-3.2)		0.694	0.3		
CG	32.9 (9.6)	29.4 (9.4) **	28.6 (8.3) **	28.8 (8.3) **												
RG	30.8 (8.1)	-	28.8 (7.8)	29.0 (8.2)												
TUG (seconds) - mean results from two trials																
IG	13.8 (3.7)	12.5 (8.3) *			1.6 (1.0-2.2)		0.379									
CG	13.6 (3.8)	11.7 (3.6) **														
TUG manual (seconds)																
IG	16.3 (9.2)	14.3 (8.8) **			2.1 (1.6-2.5)		0.693									
CG	15.7 (5.1)	13.7 (4.5) **														
TUG manual + cognitive (seconds)																
IG	21.0 (12.0)	17.7 (12.4) **			3.9 (3.0-4.8)		0.175									
CG	21.3 (8.5)	16.9 (6.5) **														
Sharpened Romberg - opened eyes (seconds)																
IG	27.9 (26.2)	35.5 (27.5) *			6.3 (1.6-11.0)		0.38									
CG	24.6 (25.4)	29.8 (26.0)														
Sharpened Romberg - closed eyes (seconds)																
IG	7.3 (2.6)	7.8 (1.1)			0.6 (-1.7-2.8)		0.959									
CG	6.7 (9.2)	7.5 (12.8)														
Sharpened Romberg - % difference between opened and closed eyes																
IG	43.0 (87.0)	42.3 (16.3)														
CG	3.9 (154.3)	29.7 (101.7)			14.9 (-29.2-59.0)		0.2									

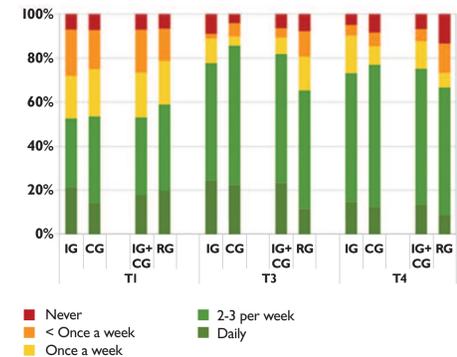
* p < 0.05 for within group difference compared with T1
** p < 0.01 for within group difference compared with T1
 η^2 = Cohen's d
FES-I = Fall Efficacy Scale International; TUG = Timed Up & Go test
N: FES-I = IG: 57, CG: 56, RG: 61, N: Active test = IG: 52, CG: 53

Figure 1. Percentage who didn't fall at all, had falls without injuries or had falls with injuries – at time-periods T1, T3 and T4



Numbers of falls, falls with injuries and «no falls» in time period T1, T3 og T4

Figure 2. Exercise-frequency at T1, T3 and T4



Numbers of falls, falls with injuries and «no falls» in time period T1, T3 og T4

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Acknowledgements This study was approved by the Norwegian Regional Etisk Komité (REK). The authors gratefully thank participants in the study and Skogli's management team for their support. Presented at the WCPT Congress 2015, Singapore.

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