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Physical training in institutionalized elderly people with multiple diagnoses—a controlled pilot study

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Abstract

Reduction in muscle mass and physical function depends on a variety of interacting factors: age, physical activity level, nutritional state and the type and impact of disease. The aim of this study was to investigate the effect of an individualized moderate intensity physical training program on muscle strength, balance, mobility, ambulation and activities of daily living (ADL) in institutionalized elderly people aged 65 and over with multiple diagnoses. Baseline assessments consisted of strength, balance, mobility/ambulation, and ADL. Twenty-one subjects were included in the intervention program. A control group (21 subjects) was first matched in pairs according to gender, age, ADL and mobility, and then by balance, ambulation and strength. The intervention program was individualized and included strength, mobility, balance and endurance training. Follow-up measures were conducted directly after the intervention and 10 weeks later. After drop-out, 20 subjects in the intervention group and 15 subjects in the control group remained for analyses. Balance and mobility improved significantly in the intervention group while declining in the control group. This pilot study indicates that a physical training program may improve functional capacity for institutionalized elderly persons with multiple diagnoses.

Keywords: Frail elderly; Physical training; Motivation; Multiple diagnoses; Hospitalization; Controlled clinical trial

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1. Introduction

The effect of exercise on healthy elderly people has been extensively investigated and many studies report improvement in strength (Nelson et al., 1994; Hagerman et al., 2000; Rhodes et al., 2000), endurance (Lemura et al., 2000), balance (Lord et al., 1996) and functional capacity such as walking (Judge et al., 1993; Topp et al., 1996). Many studies highlight the importance of high intensity training to achieve good results especially concerning strength and endurance (Aniansson et al., 1980a,b; Lemura et al., 2000). There are also studies showing that significant effects on strength and endurance can be achieved even at low and moderate exercise intensity (Engels et al., 1998; Brown et al., 2000). Then again, other studies report that if the intensity is low the effects on strength will only be moderate (Aniansson and Gustafsson, 1981; Larsson, 1982).

Physical training is very important to minimize or delay functional decline that leads to dependence (Malbut-Shennan and Young, 1999). Reduction in muscle mass and function depends not only on age but also on life style factors such as physical activity (Grimby, 1995). Low physical activity may reduce VO_{2max} and in the end lead to a situation where quiet sitting requires approximately 35% of an 80-year-old female's VO_{2max}. This percentage of VO_{2max} is similar to that averaged over an 8 h shift for workers in heavy industry (Malbut-Shennan and Young, 1999).

There are several randomized controlled studies of physical training for nursing home patients, many of which report significant strength and mobility improvements (Sauvage et al., 1992; McMurdo and Rennie, 1993, 1994; Fiatarone et al., 1994; Mulrow et al., 1994; O'Hagan et al., 1994; Schnelle et al., 1995, 1996; Lazowski et al., 1999). The results of these studies have been summarized in a recent systematic review (Rydwik et al., 2004). Only one of the studies in the review reports significant improvement in balance (Lazowski et al., 1999). One study describes the intensity as high (Fiatarone et al., 1994), four describe it as moderate (Sauvage et al., 1992; Mulrow et al., 1994; Schnelle et al., 1996; Lazowski et al., 1999) and four as low (McMurdo and Rennie, 1993, 1994; O'Hagan et al., 1994; Schnelle et al., 1995, 1996). This suggests that even moderate and low intensity levels may be enough to gain significant effects from training, which has also been shown in healthy elderly people (Engels et al., 1998; Brown et al., 2000).

In a review, Rhodes et al. (1999) describe factors that might influence physical activity in the elderly. They conclude that education and exercise history are important factors among all age groups, while physical frailty and poor health may provide the greatest barriers to exercise for elderly people. A study in Finland shows that participating in competitive sports during childhood/youth is a significant predictor for maintaining activity in old age. The study also shows that participation in recreational sports for women aged 40–64 predicts activity in old age (Hirvensalo et al., 2000). Another study points to physical activity early in life as an important factor for the establishment of good activity habits—a prerequisite for activity patterns late in life (Frändin et al., 1995).

The aim of this study was to investigate the effect of an individualized moderate intensity physical training program on muscle strength, balance, mobility, ambulation and ADL in institutionalized elderly people aged 65 and more with multiple diagnoses.