Effect of Structured Physical Activity on Prevention of Major Mobility Disability in Older Adults: The LIFE Study Randomized Clinical Trial

1. Background - brief summary of existing knowledge in this area

While studies have shown that regular physical activity improves physical performance, studies showing that mobility disability can be prevented are lacking.

Life expectancy of older Americans is increasing and while living longer is important, being able to live independently with good function has even more significance.

Mobility remains critical for functioning independently.

Decreased mobility is an independent risk factor for morbidity, hospitalization, disability and mortality.

The authors believed no trial had tested the idea that physical activity can prevent or delay onset of mobility disability so conducted a 2 year pilot study which showed improvements in physical performance measures and walking in group which received physical activity program as compared to group that received health education. This led to this randomized study.

Hypothesis of the study:
a long term structured physical activity program is more effective than a health education program in reducing the risk of major mobility disability.

2. Methods Review

Population: 1635 men and women between 70-89 who had difficulty with strength, endurance and balance and were able to walk 400 meters. Chosen from 8 sites.

Intervention: participants were randomized to a group that received a structured physical activity program or to a health education program.

Outcome: primary outcome of major mobility disability was defined as inability to complete a 400 m walk in 15 minutes without help. Since everyone could walk 400 m at beginning of trial; interested in whether there were fewer people who could NOT walk in intervention group compared to health education group.

III Methods review

- Population chosen: men and women between ages 70-89 met the inclusion and exclusion criteria.
IV Results

Physical activity group: info for 97% of participants. Major mobility disability experienced by 30% of participants; persistent mobility disability experienced by approx 15%

Health education group: info for 98% of participants; major mobility disability experienced by 35%; persistent mobility disability experienced by 20%

Reduction in the risk of developing major mobility disability of 18% (Adjusted hazard ratio .82). Those at greater pre-trial disability (SPPB<8, 45% of group) had greater benefit (Adjusted hazard ratio of .75)

Number needed to treat (NNT): 18 (18 individuals need to exercise 50 minutes/d for 5 days a week for 2.6 years for 1 individual to not develop major mobility disability).

V Authors conclusions
Over 2.6 years, physical activity, compared to health education, which produced a 40 min/wk difference in moderate physical activity, significantly reduced major mobility disability, persistent mobility disability, and the combined outcome of major mobility disability or death. The group with lower physical function at baseline had a greater benefit.

VI Reviewers Critique

Figure 3 removed to avoid copyright infringement
This figure can be found in the article itself
Well done RCT; large enough to overcome the confounding effects of hospitalizations (although low, at 186 hospitalizations/1000 persons/year), which removed individuals from the intervention group for an average of 135 days.

The primary outcome was measured

98% of individuals had their outcomes directly measured.

As the difference between the reported and measured activity measures demonstrated, much moderate activity, if not concentrated in a defined time period, is unnoticed.

Process measures were collected by different individuals than those who did the outcome assessments.

Highly screened population (low hospitalization rate, high cognitive performance), but practical. That is, the 3MSE screen cut off included some of the testing that would include those with mild cognitive impairment and they included conditions such as COPD, but limited the severity (no oxygen dependence). The mobility measure (1/4 mile in 15 minutes) was a good objective measure, but may not be the relevant measure of movement for many of our patients.

There was an insignificant difference in adverse events between the intervention and control groups (49% v 44%), although there were no differences in the types of events which might be related to physical activity (e.g., falls, fractures, musculoskeletal injuries).

There are a number of secondary outcomes to be produced from this group, including the impact on cognition.

VII Summary for practice implications

A practical, structured, self-directed, monitored exercise program, that led to 213 minutes/week of moderate physical activity, can reduce developing major mobility disability. Gives us assurance in recommending an appropriate exercise prescription for our patients, and highlights some of the benefits.