Strategic Promotion of Ageing Research Capacity

Giving an Old Heart Hope

Moderate Exercise | Cardiovascular Health | Maintaining Fitness | Cardiac Adaptation

How to keep Older People Active at Heart

Matthew Lancaster & Sandra Jones

The University of Leeds

The Investigation

Objectives

- To examine the effects of ageing on the heart.
- To compare the effects of ageing on the heart in males and females.
- To study how exercise could benefit heart function throughout the lifespan
- To use the information to propose improved ways to support the ageing heart

Background

One of the most common problems affecting older people is an intolerance of exercise. A reduction in heart function coupled with changes in muscle function means that the ability to move, exercise and perform routine tasks becomes progressively more difficult.

Furthermore as we age the risk of heart problems such as a heart-attack or arrhythmias increases, accompanied by a decreasing ability of the heart to cope with such problems. A comparable magnitude of heart-attack that will be survived readily by a young person can kill or seriously debilitate an older person.

Males and females experience this developing risk of cardiac problems at differing rates for reasons still poorly understood. It has also become apparent that exercise can help prevent declining cardiac function and restore function when it has been lost. However the effectiveness of this appears to decline as we age.

Plan

The aim is to produce a clearer description of what happens to the heart as we age. To identify whether these changes are different in males and females and to observe what effect ageing has on the progression of ageing.

Methodology

The project is using mice which only live to the age of 24-28 months. By looking at their cardiac and muscular function across their lifespan from the young (3 months) to the oldest animals (24 months) we are building a profile of how ageing alters cardiac function, the influence of gender and how exercise changes this progression of ageing.

Mice are used due to similarities in their cardiac function to humans and their brief lifespan. Already the data is showing good parallels to the human condition.

Potential Benefits

For older people

This work has already begun to increase our understanding of why older people become intolerant of exercise. It has also begun to raise questions on how common heart conditions might require different treatment in older people compared with young people. We intend to carry on building on this and identify the mechanisms whereby ageing, exercise and gender interact. The exploitation of this information will lead to refinements in advice and treatments to support older people at heart.

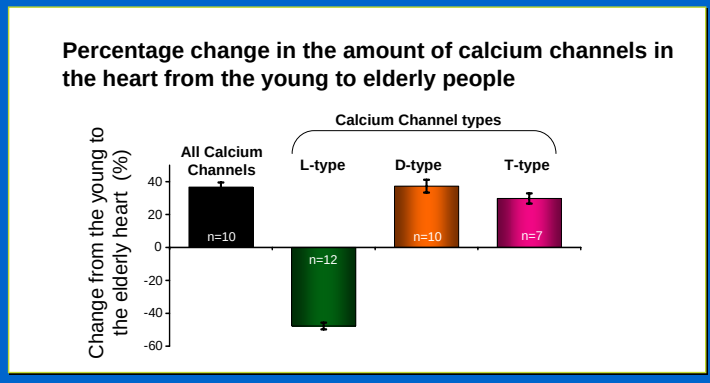

Figure: The change in the relative amounts of calcium channels in the heart with age.

These channels regulate the calcium content of the heart and determine the strength of contraction of the heart. It is these channels which are the target of several drugs designed to lower blood pressure, frequently taken by older people. The total amount of the calcium channels present increases with age, but this net effect hides a change in the actual amounts of the different types of channel.

Drugs taken to control blood pressure often act on the L-type channel, which is shown here to decrease with age. From this new data perhaps treatments which were developed for young people might need re-thinking and targeting to other channel types when used with older people?

Contact Details

Principal Investigator
Dr Matthew Lancaster
m.k.lancaster@leeds.ac.uk
Institute of Membrane and Systems Biology
Worsley Medical Building
University of Leeds, Leeds LS2 9JT

Co-Investigator
Dr Sandra Jones
s.a.jones@leeds.ac.uk
+44 (0) 113 343 4285