Vario Health Institute
Edith Cowan University
www.varioinstitute.org

Non-Pharmacological Treatments: Exercise

Presented by:
Dr Mike McGuigan
Edith Cowan University

Friday, 8th April, 2005

Extensive experience and capability in longitudinal exercise and nutrition interventions particularly in the old and very old.

"the human genome evolved over at least the last 45,000 years within an environment of high physical activity"
"the current human genome expects and requires humans to be physically active for normal function and health maintenance"

Booth et al, JAP 2000

We are programmed for physical activity

3

- Application across spectrum of problem:
  - Reducing risk in general population
  - Reversing or slowing progression in early stage
  - Maintaining quality of life, structure and function in later stage
  - Enhancing care and carers

Exercise, Nutrition, Supplements and AD

4

"There is no pharmacological intervention that holds a greater promise of improving health and promoting independence in the elderly than does exercise"

Evans & Campbell, Journal of Nutrition, 1993

5

- Epidemiological studies into Alzheimer disease indicates physical activity appears beneficial, as does a diet with high levels of vitamins B6, B12 and folate, while red wine in moderate quantities also appears protective

Epidemiology

McDowell, I. Alzheimer's disease: insights from epidemiology. Aging-Clinical & Experimental Research. 13:143-162, 2001.

6

Same risk factors:
- Elevated total cholesterol
- Increased LDL-C : HDL-C
- Elevated homocysteine
- Hypertension
- Insulin resistance, glucose tolerance and diabetes
- Obesity
- ApoE
- Testosterone and Estrogen
- Beta Amyloid

Cardiovascular Disease, AD and Modifiable Risk

Cholesterol

- Exercise and nutrition demonstrated effects on:
  - Lowered TC
  - Lowered LDL-C
  - Increased HDL-C
  - Lowered triglycerides

Scranton, R., et al. Predictors of 14-year changes in the total cholesterol to high-density lipoprotein cholesterol ratio in men. American Heart Journal. 147(6):1033-1038, 2004

Homocysteine

- Amino acid produced by the body
- Elevated levels associated with AD
- Modifiable through exercise and nutrition
- For example:
  6 months exercise in elderly
  serum homocysteine decreased 5.34%
  increased 6.1% for control group
- Folate, dietary fiber, caffeine and alcohol also factors

Vincent, K. R., et al. Homocysteine and lipoprotein levels following resistance training in older adults. Preventive Cardiology. 6:197-203, 2003.

Hypertension

- Exercise can lower BP in patients with stage 1 and 2 essential hypertension
- Average reduction in BP is 10.5 mm Hg for systolic and 7.6 mm Hg for diastolic BP

Kokkinos, P. F., P. Narayan, and V. Papademetriou. Exercise as hypertension therapy. Cardiology Clinics. 19:507-516, 2001.

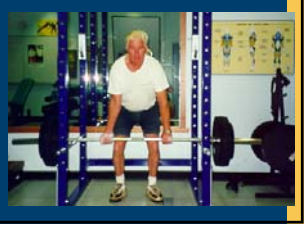
Glucose Tolerance, Insulin Resistance and Type II Diabetes

- Highly modifiable through exercise
- Increases glucose tolerance
- Reduces insulin resistance
- Very effective intervention in Type II diabetes

Miyatake, N., et al. Daily walking reduces visceral adipose tissue areas and improves insulin resistance in Japanese obese subjects. Diabetes Research & Clinical Practice. 58:101-107, 2002.

Obesity and Overweight

- Combination of exercise and dietary modification is the only effective long-term strategy for controlling body weight



ApoLipoprotein E

- APOE epsilon-4 is strongly associated with AD
- role in lipid metabolism and coronary heart disease
- Modification of effects through exercise and nutrition?

13

Testosterone and Estrogen

- Sex hormones have a role in maintaining cognitive function
- Age related reduction or intentional deprivation appears to impact AD negatively
- Exercise and body composition changes can alter testosterone and estrogen even in the elderly

14

Beta Amyloid

- Exercise and nutrition effects are not well known
- Recent report in Science suggests that lifestyle changes reduce the amount of beta amyloid build up in mice brains.

15

Reversing or slowing progression in early stage

- Psychogeriatric patients illustrate significant short term improvement in cognitive function - physical activity appears to have some arousal effect in these patients
- Several studies have demonstrated improvement with longer term exercise interventions

16

Maintaining QOL, Structure and Function

- Unexplained weight loss and cachexia - frequent clinical findings in AD patients
- dietary intake and physical activity to maintain muscle mass
- important clinical strategies requiring further investigation
- Dementia and declining neuromuscular function can be slowed or even reversed by resistance exercise

Thomas, V. S. and P. A. Hageman. Can neuromuscular strength and function in people with dementia be rehabilitated using resistance-exercise training? Results from a preliminary intervention study. Journals of Gerontology Series A-Biological Sciences & Medical Sciences. 58:746-751, 2003.

17

Enhancing care and carers

- Carer support with considerable exercise, nutrition, stress management focus
- Making patients more manageable through behavior improvement

Janevic MR. Connell CM. Exploring self-care among dementia caregivers:the role of perceived support in accomplishing exercise goals. Journal of Women & Aging. 16(1-2):71-86, 2003.

Heyn P. The effect of a multisensory exercise program on engagement, behavior, and selected physiological indexes in persons with dementia. American Journal of Alzheimer's Disease & Other Dementias. 18(4):247-51, 2003.

18

•Our research impacts a wide range of diseases
•diabetes, CVD, obesity, cancer, sarcopenia, osteoporosis…
•Many more examples

What are the spins offs?

image from http://www.cotavic.org.au/

19

•Anabolic exercise offers one of the most potent interventions for improving the structure and function of the human

Anabolic Exercise

20

•Must reverse our concept of "gentle exercise"

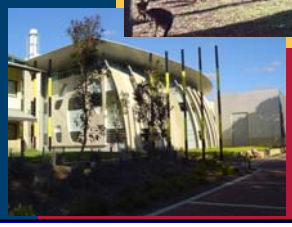
•To maintain structure and function, enhance quality of life – MUST simulate pre-industrial revolution!

•Ageism! We need to change our perceptions

Deficiencies of some physical activity programs for seniors/patients

21

Thank You



m.mguigan@ecu.edu.au
www.ecu.edu.au

22