the brain associated with the accumulation of amyloid plaques and neurofibrillary tangles (Oddo, 2012). AD causes progressive and irreversible deterioration of various cognitive functions, including memory, attention, concentration, language, thinking and behaviour (Burns & Iliffe, 2009). The loss of autonomy of the elderly is aggravated in the cases of AD, which often culminates in institutionalization. While the major risk factor for AD is age, the process is distinguished from normal aging. Although there are common changes and manifestations, probably supported by similar molecular and cellular changes, in AD brain aging process is aggravated. Literature have attributed an important role to oxidative stress and mitochondrial alterations either in the aging process or the AD. Thus, this study aims to understand the changes associated with normal aging process in mitochondria function and to identify some of the key differences in individuals with AD.

METHODS

The sample was composed by 14 normal old subjects (80.5±7.7 years) and 11 AD (83.2±7.7 years) participated in this study. All the subjects were institutionalized and the diagnose of AD was in charge of a clinical Neurologist. After 9 hours of fasting condition, 10ml of of blood were collected by venous puncture into the vacuum K_3EDTA tubes and then centrifuged to separate serum, and to obtain lymphocytes. Mitochondria function [respiration in state 3 and state 4, and respiratory control ratio (RCR=state 3/state 4)] were measured in lymphocytes cells in OROBOROS, according to the equipment procedures. *Malondialdehyde* (MDA) was assayed in serum samples by spectrophotometic method. Protein content was determined by Biureto method. To compare average values of both groups, a t-test for independent samples was used. Significance level was set a 0.05.

RESULTS

The obtained results failed to found significant differences between groups in mitochondria respiration in states 3 (1.77±0.67 and 1.80 ±1.07 for normal and AD, respectively) and 4 (0.56±0.33 and 1.55 ±0.77 for normal and AD subjects, respectively). Significant changes between groups were found in RCR (3.76±1.54 and 2.33±1.36 for normal and AD, respectively) (t=2.553; p=0.017) and in serum MDA (15.796±4.098 and 11.169±4.459 for normal and AD, respectively) (t=2.230; p=0.041).

CONCLUSIONS

These results revealed that comparatively with AD, normal aged subjects' evidence "healthy" mitochondria once they show high respiratory control (RCR). Nevertheless, the amount of oxidative stress damage (MDA) was higher in normal old subjects, possibly due to the influence of other unconsidered variables (medication, diet and daily physical activity).

REFERENCES

Burns, A. & Iliffe, S. (2009). Alzheimer's disease. BMJ. 338: b158.

Oddo, S. (2012). The role of mTOR signaling in Alzheimer disease. *Front Biosci (Schol Ed)*, *4*: 941-52.

2-Years of Physical Exercise and Hypertension

Luis Leitão[1], Ana Leitão[2], Hugo Louro[3]

1. Superior School of Education of Setúbal, Portugal; luis.leitao@ese.ips.pt; 2. Faculty of Medicine of Masaryk University of Brno, Czech Republic; 3. Sport Sciences School of Rio Maior, Portugal

INTRODUCTION

Prevention of cardiovascular disease through physical exercise is very important on preventing disease and quality of life of older adults. The risk factors for this decease like high blood pressure, high cholesterol, overweight and obesity, diabetes mellitus, and physical inactivity can be changed through exercise (AHA, 2005; Castelli, 1984; Chodzko-Zajko et al., 2009). As main purpose of the study we intend to evaluate the effects of training and detraining during two

years of an exercise program in blood pressure and resting heart rate of older adults.

METHODS

Fifty one women (70.2± 6.4 years and 159.54±12,81cm) volunteered to participate in a 2-year exercise program with periods of nine months of physical exercise followed by a period of three months of detraining. The multicomponent program was prescribed according to ACSM (Chodzko-Zajko et al., 2009) and conducted by a specialist in older adults training. Each training period consisted in aerobic and muscle endurance group sessions held two days per week with forty-five minutes each session. All subjects were tested 5 times, before and after each training period and at the end of the detraining periods.

RESULTS

Blood pressure improved significantly only at the end of the program, besides resting heart rate improved right after the first period of exercise. Each detraining period resulted in deterioration of each variable. With the end of the program significant improvements were achieved in all variables of the study.

Table 1
Hemodynamic parameters in training and detraining periods

	E-01	E-02	E-03	E-04	E-05
Weight (Kg)[1,2]	71.92±8.98	70.78±8.86	71.2±8.88	69.28±8.7	69.74±8.93
BMI (m^2/kg)[1,2]	29.67±3.96	29.50±3.90	29.66±3.91	28.6±3.87	29.05±3.90
Systolic P (mmHg)[2]	144±17.75	139±14.13	143±13.1	137±12.19	140±12.53
Diastolic P (mmHg)[2]	82±10.41	76±8.46	82±9.95	75±9.31	79±10.34
Resting HR (bpm)[1,2]	77±7.69	70±9.21	74±8.13	70±8.61	74±8.62

[1] significant differences in the first year program ($p \leq 0.05$);
[2] significant differences between the beginning and the end of the program ($p \leq 0.05$);

CONCLUSIONS

The results of this study shows that nine months of physical exercise weren´t enough to improve blood pressure and three months reduce significantly the benefits achieved with training. This study reveal that physical exercise must be taken through the life span of the olders to maintain the benefits of exercise and reduce the impact of the risk factors of this decease.

REFERENCES

AHA. (2005). Recommendations for Blood Pressure Measurement in Humans and Experimental Animals: Part 1: Blood Pressure Measurement in Humans. A *Statement for Professionals from the Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research, 45,* 142-161.

Castelli, W. (1984). Epidemiology of coronary heart disease: the Framingham study. *American Journal of Medicine, 27,* 4–12.

Chodzko-Zajko, W.J., Proctor, D.N.,Fiatarone Singh, M.A.,Minson, C.T., Nigg, C.R., Salem, G.J., & Skinner, J.S. (2009). American College of Sports Medicine position stand. Exercise and Physical Activity for Older Adults. *Medicine & Science in Sports & Exercise, 41*(7), 1510-1530. doi. 10.1249/MSS.0b013e3181a0c95c.

Impact of a psychomotor massage program on the quality of life of institucionalized elderly people

Gisela Roque, [1] Catarina Pereira[1,2]; Guida Veiga[1,2]

1. Departamento de Desporto e Saúde, Escola de Ciências e Tecnologia, Universidade de Évora, Portugal; gisela.cr.roque@gmail.com; 2. Research Center in Sports Sciences, Health and Human Development, CIDESD, Portugal

INTRODUCTION

The world's population is ageing (United Nations, 2015). Therefore the number of older people who are dependent on others, who have reduced mobility and physical and/or mental health problems, has been progressively increasing. These scenarios often lead to institutionalization, which has been associated with the loss of quality of life (Luppa, et al.,