Background

Detraining is a partial or complete loss of training induced anatomical, physiological and performance adaptations, as a consequence of reduction or cessation trainings. In Athletes the rapidly performance decline once the training process is interrupted, leading to impaired performance capacity. According to the principle of reversibility, the training induced physiological adaptations and may disappear when the training load is not sufficient. (Mujika & Padilla, 2000a).

To avoid any confusion with the terminology, a glossary is given in Table1

- **Detraining**: A partial or complete loss of training induced anatomical, physiological and performance adaptations, as a consequence of reduction or cessation trainings.

- **Training cessation**: A temporary discontinuously or complete abandonment of a systematic program of physical conditioning.

- **Training reduction**: A progressive or non progressive reduction of the training load during a variable period of time, in an attempt to reduce the physiological and psychological stress of daily training.

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**Effects of detraining on metabolic demands after 12 weeks of vigourous training program in a randomized group of over 65 yrs**

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Aim

Exercise training for subjects over 65 should be applied to improve quality of life. However, physiological adaptations are transitory and disappear after reduction or cessation trainings (Bousquet et al., 2013 - Mujika & Bousquet, 2010). Beside detraining exerts well known effects in young athletes, while limited information are available for elderly subjects.

PURPOSE: The aim of this study was to investigate the effects of 8 weeks of detraining in elderly subjects (age > 65 yrs), after 12 weeks of exercise prescription at vigorous intensity.

Methods

17 healthy participants (69.3 ± 4.3 yrs) performed a randomized controlled trial on training program about 12 weeks at vigorous intensity (range 64-85% of Heart Rate Reserve) followed by 8 weeks of detraining. Before and after the training cessation period, subjects underwent an exercise test on a cycle Ergometer test until exhaustion to assess VO$_2$max.

Heart Rate Recovery (HRR), Waist-Hip ratio (WHR) and Body Mass Index (BMI) were also assessed. Paired t-test were used to compare the detraining effects on all variables before and after 8 detraining weeks.
According to ACSM guidelines, Physical Activity (PA) was established as 60<84% of the Heart Rate Reserve (HRR) and monitored continuously during activity with the heart-rate monitor Polar T31 Coded™, and also transmitted by a telemetry system (Hosand®). The individual HRR for each participant was assessed according to the Estimated Maximal Heart Rate Formula, where 
\[ HR_{max} = 206.9 - (0.67 \times Age) \]. Baseline HR was registered for all participants for three days: in the morning and immediately after waking up.

**Fitness Program**

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**Results**

\[ VO_{2max} \] decreased significantly by 6.65% during the training cessation period (24.2 ± 4.7 to 22.6 ± 4.5 ml/kg/min p=0.32)

However, BMI decreased by 5.3% (26.5 ± 3.5 to 25.1 ± 3.9 kg/m2 p=0.24)

Conversely HRR increased by 7% (62.1± 8.8 to 67.1 ± 9.2 bpm p=0.15)

WHR increased significantly by 9% (0.92 ± 0.06 to 1.01 ± 0.09 p<0.05)
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Conclusions & Practical implications

In the present investigation, after the training cessation period following a vigorous training program, subjects were able to maintain a level of VO²max without a negative effect.

Training exercise at vigorous intensity, instead of moderate intensity which is more commonly applied, were more positive also for BMI and HRR, otherwise the WHR were significantly different.

Previous studies, employing moderate intensity (<64% Heart Rate Reserve) showed high tendencies to return back to the pre-training level during detraining.

The Medical Doctors could consider also vigorous intensity exercise on the prescription of physical exercise for elderly and also that 8 weeks of detraining are fair to disappear physiological adaptations.

References


REFERENCES