

either sex. Future studies should elucidate possible mechanisms of actions.

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The impact of menopausal status on cardiac responses to exercise training and lower body negative pressure

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Introduction: Training status and sex hormones influence the cardiovascular response to orthostatic stress. The aim of this study was to investigate the impact of menopausal status on left ventricular (LV) function and rotational mechanics in response to exercise training and lower body negative pressure (LBNP).

Methods: Twenty-five healthy untrained middle-aged women (age 45–58 years; 11 pre-menopausal [Pre-M], 14 post-menopausal [Post-M]) completed 12 weeks of exercise training (3 sessions/week consisting of 4 × 4 min intervals at 90–95% maximum heart rate). Blood volume was assessed via CO-rebreathing, and maximal aerobic capacity was measured on an upright cycle ergometer before and after exercise training. LV function was assessed via echocardiography at 0, –15 and –30 mmHg LBNP.

Results and Discussion: Peak power output and maximal aerobic capacity increased after exercise training ($P < 0.01$), but this increase was greater in pre- than post-menopausal women (mean ± SD; Pre-M before 147 ± 29 vs. after 179 ± 28, Post-M before 145 ± 26 vs. after 169 ± 24 W; Pre-M before 29 ± 5 vs. after 37 ± 5, Post-M before 29 ± 6 vs. after 34 ± 5 mL/min/kg; respectively, both $P < 0.05$). Blood volume increased after exercise training in pre- and post-menopausal women ($P = 0.04$), resulting in a smaller decrease in end-diastolic volume during LBNP (LBNP × training $P = 0.06$). This enhanced LV filling after exercise training was further evidenced by higher peak trans-mitral filling velocities in early diastole both at rest and during LBNP (training $P < 0.01$). Cardiac output in pre-menopausal women during LBNP was underpinned by higher heart rates and greater peak twist, systolic twisting velocity and basal rotational mechanics, compared with post-menopausal women (menopause interactions $P < 0.1$).

Conclusion: Pre-menopausal women show a greater aerobic adaptability to exercise training than post-menopausal women, and rely more on acute cardiac responses to cope with low levels of orthostatic stress.

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Testosterone, anastrozole and venous thrombosis

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Background: Some studies have shown that testosterone (T) therapy is associated with an increase in venous thrombotic events,

particularly in men at high risk. This may be due to aromatization of T and subsequent estrogen induced thrombophilia.

Subcutaneous (SC) T implants bypass the liver and do not adversely affect the clotting system. However, T increases renal erythropoietin and stimulates the bone marrow increasing erythrocyte production. Elevated Estradiol (E2) is also associated with an increase in hematocrit (Hct) in men.

Methods: 344 adult male patients were accrued March 2013–2017 to an IRB approved chart review study investigating the occurrence of cardiac and prostate events in men treated with SC T, or T combined with anastrozole (A) in the implant. A is prescribed to prevent excess aromatization to E2.

Serum T and E2 levels were measured 4 weeks after insertion and/or at the end of the cycle when the patient became symptomatic. Hb and Hct were monitored. Mean age at first insert was 52.9 ± 9.8 y. Mean age at the time of analysis was 57.7 ± 10.5 y. Mean length of therapy at the time of analysis was 4.8 ± 3.1 years, range 0.17–11.6 y.

Results: 98.5% (339/344) of men treated during this time period received A in combination with T. Mean T dose was 1878 ± 263 mg. Mean SC A dose was 14.8 ± 3.9 mg with the majority of men receiving 16 mg. Mean 4 week T level on therapy was 1235 ± 313 ng/dl. Mean E2 at week 4 was 16.45 ± 11.73 pg/ml. Mean T level when symptoms returned was 586 ± 248 ng/dl. Mean E2 was 18.65 ± 11.78 pg/ml. Mean Hb on therapy was 16.3 ± 1.33 and mean Hct was 48.5 ± 4.0.

There have been no episodes of venous thrombosis or thromboembolic events in 344 men treated with T + A implants in over 1600 person-years of therapy. This compares favorably to an expected annual incidence of 149/100 000 (1.5/1000) for males age 55–59 y.

Conclusion: SCT + A implant therapy does not increase and may lower the occurrence of venous thrombotic events.

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Objective measures of activity in the elderly: Distribution and associations with demographic and health factors

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Background: Little is known about the distribution of activity over the 24-hour spectrum in late old age and its association with demographic and health factors. We aimed to evaluate the distribution of physical activity (PA), sedentary behavior and sleep and associated factors in the elderly population.

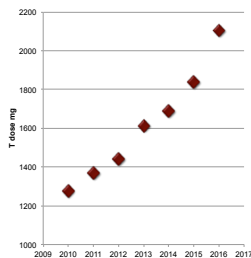
Methods: Our study included 1210 participants (51.9% women) aged 70–94 years (mean age 77.5 years, standard deviation (SD): 5.0) from the population-based Rotterdam Study. Participants wore a triaxial accelerometer (GeneActiv) around the wrist for 7 days, between July 2014 and June 2016. We examined if PA, sedentary behavior and sleep differed by age, sex, body mass index (BMI), smoking status, alcohol consumption, education, season, functional capacity, marital status, presence of chronic disease and use of sleep medication.

Results: Mean total PA, expressed in milli-gravity(mg) units, was slightly higher for women (20.3, SD: 5.6) than for men (19.3, SD: 5.2, $p < .01$). Mean (SD) daily duration spent in sedentary behavior and light and moderate-to-vigorous PA was 13.3 (1.5) h/d, 147.5 (31.5) minutes/d and 75.0 (25.5) minutes/d, respectively, among women; and 13.8 (1.6) h/d, 140.5 (31.1) min/d and 71.5 (24.5)



Dosing (2013-17)

- Mean T dose 1878 ± 263 mg
- 339/344 (98.5%) of men treated with an AI, T + A implant
 - <30% in 2010
- Mean SC A dose was 14.8 ± 3.9 mg with the majority of men receiving 16 mg A
 - 2 x T 120 mg + A 8 mg implant



Levels on therapy

- Mean T level at week 4 was 1235 ± 313 ng/dl
 - 25% T > 1500 ng/dl
 - 65% T > 1100 ng/dl
 - No ADE**
- Mean E2 at week 4 was 16.45 ± 11.73 pg/ml
- Mean T level when symptoms returned was 586 ± 248 ng/dl
- Mean E2 'end' was 18.65 ± 11.78 pg/ml

Erythrocyte count

- Mean Hb on therapy was 16.3 ± 1.33 g/dl
- Mean Hct was 48.5 ± 4.0
 - Elevated Hct correlated with T and E2 levels
- Donate blood for Hb > 18.5 or Hct > 55
 - Offer to reduce T dose

Secondary erythrocytosis

- 27 men on study (donated blood)
- Increased with higher T doses 2013-17
- 1/3 men with elevated rbc have/had a diagnosis of obstructive sleep apnea
 - Secondary polycythemia (hypoxia)
- Do not see an increase in sleep apnea in men on SC T + A therapy

Results

- No episodes of venous thrombosis or thromboembolic events in 344 men treated with T + A implants in over 1600 person-years of therapy
- This compares favorably to an expected annual incidence of 149/100 000 (1.5/1000) for males age 55-59 y (57.7 y)

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