

### **Comunicaciones orales 3 / *Oral Presentations 3***

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***Autores/Authors:***

Rael, B.1, Romero-Parra, N.1, Alfaro-Magallanes, VM.1, Barba-Moreno, L.1, García-Alcaraz, A.1,2, Cupeiro, R.1, Peinado, AB.1 on behalf of the IronFEMME study Group

***Filiación/Affiliations:***

1 LFE Research Group. Department of Health and Human Performance. Facultad de Ciencias de la Actividad Física y del Deporte. Universidad Politécnica de Madrid, Spain 2 Facultad de Educación, Universidad de Almería, Spain

***Título/Title:***

Bone mineral density in well-trained females

***Resumen/Abstract:***

Introduction: Although the association between sex hormones and bone mineral density in healthy sedentary women has been widely studied (1,2), only a few studies have evaluated this relationship in trained females (3). Therefore, the purpose of this study was to assess the influence of sex hormones on BMD in physically active females: eumenorrheic females, oral contraceptive (OC) users and postmenopausal women. The secondary aim was to determine if maximal oxygen consumption ( $\dot{V}O_{2max}$ ) or maximal back squat strength (1RM) could be good predictors of BMD in this population.

Material and methods: Fifty-two eumenorrheic females (32±11 years; 59.74±10.51 kg; 26.15±7.8 body-fat %) thirty-one monophasic OC users (25±4 years; 58.10±5.85 kg; 25.71±5.47 body-fat %) and fourteen postmenopausal women (51±3 years; 54.10±4.10 kg; 24.18±5.17 body-fat %) participated in this study. All of them were well-trained in endurance and/or in strength training. Volunteers performed a dual-energy X-ray Absorptiometry scan (DXA) scan, a maximal back squat

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and/or a maximal treadmill test. All these tests were carried out during the early follicular phase for the eumenorrheic females and in the withdrawal phase for the OC group.

Results: One way ANOVA tests reported significant differences for BMD ( $F_{2,94}=5.015$ ;  $p=0.009$ ) among groups (eumenorrheic females:  $1.19\pm 0.07$  g/cm<sup>2</sup>; OC users:  $1.17\pm 0.06$  g/cm<sup>2</sup>; postmenopausal females:  $1.13\pm 0.08$ g/cm<sup>2</sup>). Scheffé test reported lower values of BMD in postmenopausal females compared to the eumenorrheic group ( $p=0.008$ ). Pearson's correlation did not show significant association between BMD and VO<sub>2</sub>max ( $r=0.095$ ;  $p=0.355$ ), whereas a positive relationship between BMD and 1RM ( $r=0.479$ ;  $p<0.001$ ) was observed.

Conclusions: The present study showed a decrease of BMD in postmenopausal compared with eumenorrheic women in well-trained females. The loss of BMD after menopause seems to be not fully compensated by exercise (4), but this could effectively mitigate the loss of BMD. Moreover, 1RM back squat reported a slight association to BMD. Hence, strength training may be the best choice for preventing BMD loss. Health care professionals should consider this finding when training with women.

References:

1. Steffi C, et al.(2018). ACS Appl Mater Inter. 10(12):9988-98.
2. Deng Z, et al. (2017). Am J Physiol-Cell Ph. 313(2):C162-C72.
3. Jürimäe J, et al. (2011). J Endocrinol Invest. 34(11):835-9.
4. Bonjour J-P, et al. (2007). Med Sport Sci. 2007;51:64-80.

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**Autor de correspondencia (Presentador) / Correspondence author (Presenting author):**

Beatriz Rael Delgado / [beanad16@gmail.com](mailto:beanad16@gmail.com)