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Fitness, Fatness, and Metformin Response

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RESPONSE

Dear Editor-in-Chief:

We appreciate the comments of Dr. Falk and Mr. Dotan and would like to respond to their concerns. As we indicate in the discussion of our article (1), we realize that changes in maturation and body composition can affect the assessment of $\dot{V}O_{2max}$. However, we do not feel that the change in $\dot{V}O_{2peak}$ observed in the subjects that improved $\dot{V}O_{2peak}$ was primarily related to a reduction in body weight. As Dr. Falk and Mr. Dotan point out, the subjects that improved $\dot{V}O_{2peak}$ (by $4.1 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) reduced body weight by 4.3 kg. However, subjects who did not improve $\dot{V}O_{2peak}$ (and actually had a decrease in $\dot{V}O_{2peak}$ of $2.7 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) reduced body weight by 3.2 kg (see Table 2 in Ref. (1)). It is highly unlikely that a between-group difference of 1.1 kg in body weight reduction would explain a $6.8 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ difference in $\dot{V}O_{2peak}$.

Having said this, we took Dr. Falk and Mr. Dotan's advice and reanalyzed the data using $\dot{V}O_{2peak}$ expressed as milliliters per kilogram of fat-free mass (FFM). This analysis did not change the overall results or our interpretation of the findings. Subjects who increased $\dot{V}O_{2peak}$ ($8.7 \text{ mL}\cdot\text{kg}^{-1}$ FFM) reduced percentage body fat and fat mass by 3.8% and 4.7 kg, respectively. Subjects who did not improve $\dot{V}O_{2peak}$ ($-1.1 \text{ mL}\cdot\text{kg}^{-1}$ FFM) also reduced percentage body fat and fat mass by 2.9% and 2.7 kg, respectively. Here again, these small differences in body composition change between groups cannot explain the large differences in fitness expressed in milliliters per kilogram of FFM.

We do agree with Dr. Falk and Mr. Dotan that in this setting, $\dot{V}O_{2peak}$ is the more appropriate term to use as opposed to $\dot{V}O_{2max}$. Although peak HR values were lower than would be expected, it should be realized that these were sedentary obese subjects who exercised to volitional exhaustion (and the OMNI RPE and RER values were consistent pre- to postintervention in both groups). With regard to the comment that the training stimulus was simply insufficient, we did not examine a training stimulus but rather categorized subjects into groups who did or did not improve fitness (because all subjects received lifestyle intervention and a nonintervention control group was not available). Using these analyses, we believe that our conclusions are justified.

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The authors declare no conflicts of interest.

REFERENCE

- Rynders C, Weltman A, Delgiorno C, et al. Lifestyle intervention improves fitness independent of metformin in obese adolescents. *Med Sci Sports Exerc.* 2012;44(5):786–92.