

Comment to: The effects of an 8-week multicomponent inpatient treatment program on body composition and anaerobic fitness in overweight and obese children and adolescents

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Dear editor

We note with surprise a recent paper entitled “The effects of an 8-week multicomponent inpatient treatment program on body composition and anaerobic fitness in overweight and obese children and adolescents” by Karner-Rezek et al¹ published in the *International Journal of General Medicine* concerning the effects of an 8-week multicomponent inpatient treatment program on body composition and anaerobic fitness in overweight and obese children and adolescents. We would like to take this opportunity to comment on the study findings and, in particular, address the methodological inconsistencies and ambiguities in this study.

The authors of the paper were not the same as those who designed and performed the study. Only two of the authors were directly involved in assessing specific data for body composition (dual-energy X-ray absorptiometry) and anaerobic performance (Wingate test). Moreover, the other authors were never involved with any of the study participants nor were they part of the scientific team at the Alpine Children's Hospital Davos. Further, the original scientific team was never informed that their study has been submitted for publication. Since the authors were only marginally involved in the study they published, we feel obliged to clarify relevant inaccuracies relating to the methods and their consequence on the data and the clinical conclusions reported in this paper.

Study design

The data reported by Karner-Rezek et al¹ were collected in a substudy of a prospective, randomized intervention study on the effects of whole body vibration training (Power Plate®, Badhoevedorp, the Netherlands) on body composition and fitness in obese children and adolescents (unpublished data). Patients hospitalized at the Alpine Children's Hospital Davos were randomly allocated to two groups to receive either the standard exercise program² or the standard exercise program plus whole body vibration training three times per week for 8 weeks. The assessment of body composition (dual-energy X-ray absorptiometry) and anaerobic performance (Wingate test) was performed at the Swiss Olympic Medical Center in Switzerland. The original study aimed to test the hypothesis that whole body vibration training could reduce loss of lean body mass during an 8-week inpatient weight loss program in obese children and adolescents.²

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Patient selection

Unfortunately, the selection of patients in the study reported by Karner-Rezek et al¹ is unclear and dubious for several reasons. The authors stated that "... due to incomplete data in energy intake and training, the number of subjects was reduced from an initial pool of 122 to a total of 28 (9 girls, 19 boys)". Energy intake during this study was not monitored but prescribed at program entry as follows: body weight <50 kg =1,200 kcal/day; 50–80 kg =1,400 kcal/day and >80 kg =1,600 kcal/day.² Therefore, while energy expenditure data were available for all 122 subjects, the training data were to our knowledge not available to the authors of the disputed study.¹ This is further corroborated by the fact that the authors neither mentioned how energy expenditure was calculated nor reported any exercise training-related data. Therefore, the reasons for the data reduction to 28 subjects are totally incomprehensible. Moreover, the citation of our standard inpatient treatment program stating that the nutritional intervention targeted a daily energy deficit of about 500 kcal is not based on any standards in the program.² Further, it is of note that in the original study half of the study subjects were randomized to receive additional whole body vibration training. This is not mentioned in the disputed paper, hence it is not clear whether or not that study included subjects who engaged in whole body vibration training, which may have influenced the study outcomes.

Exercise training program

Karner-Rezek et al¹ compared their study results with those of other studies using high-intensity exercise. Indeed, high-intensity exercise has gained increased interest as a training modality for various populations and also for obese children and adolescents;^{3,4} however, the standard exercise program at the Alpine Children's Hospital Davos clearly did not comply with high-intensity exercise. High-intensity endurance-type exercise targets heart rates in the range of 77%–95% of maximal heart rate.⁵ In contrast, the standard exercise program focused on supervised endurance-type activities to improve aerobic fitness (eg, ball games, indoor swimming, hiking, and snow shoe walking) at target intensities of 50%–75% of the maximal heart rate achieved during an incremental cardiopulmonary exercise test.² Therefore, it is completely misleading to compare the standard exercise program with other findings on the effects of high-intensity exercise.

Study results and interpretation

Karner-Rezek et al¹ report a significant loss of lean body mass and highly significant improvements in anaerobic fitness

in both genders after the 8-week intervention. However, a statistically significant loss of lean body mass in girls is not indicated in Table 3. In a previous publication by our group,² we reported a significant loss of lean body mass in 130 severely obese boys and girls after the inpatient weight loss intervention without finding any significant differences between the 78 boys and 52 girls. With respect to the Wingate test, the improvement in anaerobic performance was only evident for variables adjusted for body weight. Therefore, the improvements are likely to be the result of the intensive weight loss and less likely indicative of a true training effect. A lack of improvement in unadjusted anaerobic performance (except for improvement in minimum power in boys) is not surprising at the moderate training intensities performed by the patients. The degree to which whole body vibration training may have influenced body composition and anaerobic performance combined with intensive weight loss remains unknown to this date.

In conclusion, without clarification of the unresolved issues raised in this letter, the study results reported by Karner-Rezek et al¹ remain obscure and should be interpreted with caution.

Disclosure

The authors report no conflicts of interest in this work.

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Reply

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Study design

The novel aspect of our study¹ is based on the correlation of anaerobic fitness pre/post intervention and concomitant changes in body mass and body composition. All the relevant data (ie, from dual-energy X-ray absorptiometry and Wingate testing) are in full possession of the authors and the Swiss Olympic Medical Center in Switzerland. The collection of these data was carried out entirely by the Swiss Olympic Medical Center.

Patient selection

The authors of the above letter note that "... the reasons for the data reduction to 28 subjects are totally incomprehensible". This is not the case. The reasons for the reduction were incomplete pre/post intervention Wingate test data sets. Moreover, dual-energy X-ray absorptiometry data on floppy discs were only available for a small subgroup. We investigated possible correlations between anaerobic fitness and changes in body mass and body composition based on pre/post intervention Wingate tests. We made no assumptions or calculations on the basis of the standard exercise program.

Exercise training program

The authors of the letter suggest that the training data were not available to us. Data for the exercise regime during the intervention period were indeed not available, so only the

exercise mode was described and cited correctly from Knöpfli et al.² We have to concede that the term "training data" may be somewhat imprecise and misleading, and could be better termed "anaerobic fitness data".

Study results and interpretation

The authors of the letter state "With respect to the Wingate test, the improvement in anaerobic performance was only evident for variables adjusted for body weight. Therefore, the improvements are likely to be the result of the intense weight loss and less likely indicative of a true training effect." This is in full agreement with our finding that "peak power in absolute terms did not change significantly, but as with absolute mean power, relative mean power increased due to the loss of weight". With regard to whole body vibration we were unable to find the necessary randomization and subgroup selection mentioned by Knöpfli et al.² We therefore have to assume that the groups were mixed. Moreover, we are unaware of any differences in study findings between whole body vibration and conventional resistance training.

Concluding remarks

Funding for the study by Knöpfli et al² was arranged by the Swiss Olympic Medical Center, Medizinisches Zentrum Bad Ragaz, Switzerland, by two coauthors of our publication via a trust, with the Wingate tests costing 24,000 CHF alone. In return, they were verbally granted coauthorship by Knöpfli for their substantial contribution. However, they were rather surprised to learn that their efforts were not honored with coauthorship (as covenanted by Knöpfli) and that they were not mentioned in the Acknowledgments section of the published paper.

Disclosure

The authors report no conflicts of interest in this work.

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