

Response on Al-Eisa E, et al. (J Pak Med Assoc. 67: 499-507, 2017)

## Effects of supervised aerobic training on the levels of anti-Mullerian hormone and adiposity measures in women with normo-ovulatory and polycystic ovary syndrome

Al-Eisa E, Gabr SA, Alghadir AH

Madam, thank you for your e-mail regarding the concerns which have been raised by a reader on our article titled "Effects of supervised aerobic training on the levels of anti-Mullerian hormone and adiposity measures in women with normo-ovulatory and polycystic ovary syndrome". We want to thank the reader for their observations and critiques. Although the research work has been peer revised and published 5 years ago, we have tried our best to address the concerns raised by the reader.

Please find below a point-by-point response to each concern:

**Concern 1:** This study has only 3 authors, despite the patients undergoing a 3x weekly supervised exercise programme for 12 weeks. This seems likely to require a larger author group.

**Ans:** We concur with this statement. In addition to three co-authors who contributed significantly to the study, we would like to clarify that five well trained research assistants were responsible also for data collection and intervention. The data collectors were reimbursed for their services.

**Concern 2:** Over 12 weeks of the aerobic exercise programme, not one of the 90 enrolled patients is reported to have dropped out.

**Ans:** We are grateful for your feedback. We confirm that the data analyses followed the intention-to-treat methodology. Thus, we included all available participants at the time of randomization. The carry-forward method was used to impute missing data. The data of dropouts were carried forward from the most recent data available.

**Concern 3:** Despite having a lower mean reduction in

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body weight than Group B, Group C had a much greater reduction in waist circumference. I fail to see how this is possible, although it may be a typo.

**Ans:** We appreciate your insightful comment. We re-examined our data in groups A, B, and C, the data of all clinical parameters especially BW and waist circumference in table 1 had been typographically replaced. We are prepared to make this adjustment (See Table 1 for corrections).

**Concern 4:** This study reports an unfeasibly large treatment effect in 12 weeks of light aerobic exercise without dietary intervention. Changes in BMI, body weight, waist circumference and AMH for the 3 groups over the study period are shown in the powerpoint below, with p-values calculated with the independent samples t-test. 8/12 (67%) of these values are statistically significant ( $p < 0.01$ ). A similar study from 2011 (Fertil Steril. 2011 Jun 30;95(8):2696-9. doi: 10.1016/j.fertnstert.2011.01.137.) reported no change in BW over a 16-week period of aerobic intervention.

**Ans:** We appreciate your insightful comment. Following 12-week aerobic exercise intervention follow-ups, the changes in BMI, body weight, waist circumference, and AMH among the three study groups were observed.

The change in anthropometric parameters and hormonal profiles after 12 weeks of aerobic exercise was correlated with a large number of previously published data;

1- For instance, a previous study reported a significant change in body weight, body mass index, waist circumference, insulin resistance indexes and serum levels of sex hormone-binding globulin, androstenedione and dehydroepiandrosterone sulphate from baseline data in overweight women with polycystic ovary syndrome (PCOS) after treatment with a 12- and 24-week SET exercise programme.

2- Morteza et al. concluded in a separate study that aerobic training improves anthropometric, metabolic, and hormonal profiles in young women with PCOS.

**Table-1:** Clinical data at baseline and at 3- and 12-week supervised aerobic training follow-ups of obese women with or without polycystic ovary syndrome (PCOS).

Parameters	Group A (Control)	Group B (PCOS)	Group C (Obese)
N	30	30	30
Age (years)			
Baseline	28.7 ± 0.99	27.9 ± 2.55	27.6 ± 1.4
Duration of infertility (m)			
Baseline	21.30±1.4	21.9±1.62	21.60±1.34
Systolic BP (mmHg)			
Baseline	111.2 ± 3.9	135 ± 3.8	125.2 ± 2.98
Diastolic BP (mmHg)			
Baseline	71.7 ± 1.9	85.7± 2.7	76.6± 2.0
VO2 max (ml/kg*min)			
Baseline	32.44 ± 2.81	35.4 ± 2.3	38.4 ± 2.95
<b>BMI (Kg/m<sup>2</sup>)</b>			
Baseline	22.8 ± 1.3	33.45 ± 2.5	31.7± 1.1
3 weeks	22.2 ± 1.1*	31.9 ± 1.36*¥	30.4 ± 1.0*¥
12 weeks	21.8 ± 1.3*	28.5 ± 1.38*¥	26.8 ± 0.87*¥
<b>BW</b>			
Baseline	71.2 ± 2.5	89.8 ± 3.95	84.9 ± 3.6
3 weeks	69.5 ± 4.39*	86.4 ± 3.5¥	82.9 ± 2.4*¥
12 weeks	65.4 ± 4.5*	84.8 ± 3.28*¥	82.2 ± 1.33*¥
<b>WC (cm)</b>			
Baseline	75.2 ± 2.7	96.2 ± 4.2	94.2 ± 1.27
3 weeks	73.5 ± 0.71	94.5 ± 1.9¥	93.5 ± 0.95¥
12 weeks	72.7 ± 2.6*	93.8 ± 1.1¥	92.7 ± 0.92¥
<b>WHR</b>			
Baseline	0.69 ± 0.02	0.91±0.05	0.91+0.04
3 weeks	0.66 ± 0.04*	0.89 ± 0.037*¥	0.90 ± 0.04*¥
12 weeks	0.60 ± 0.06*	0.80 ± 0.03*¥	0.86±0.03*¥
<b>Ferriman–Gallwey score (hirsutism score)</b>			
Baseline	5.34 ± 0.8	12.8 ± 1.58	11.6 ± 0.55
3 weeks	5.25 ± 0.23*	12.65± 2.56*¥	11.2 ± 0.54*¥
12 weeks	5.22 ± 0.01*	12.61 ± 1.33*¥	10.89 ± 0.42*¥

Values are expressed as mean ±SD; \*P, 0.05 versus baseline.; ¥P, 0.05 versus Group A. BW, body weight; WC, waist circumference; WHR, waist-to-hip ratio.

3- Similarly, in another study, polycystic ovary syndrome infertile women (n = 20) underwent 12 weeks of three aerobic training sessions per week with a heart rate reserve intensity of 40-65. At the conclusion of the training period, their findings also revealed a statistically significant difference between the weight, BMI, LH, and Vo2max levels of the two groups (P < 0.05). (Please see reference: Akbari Nasrekani, Zahra, and Mehrdad Fathi. "Efficacy of 12 weeks aerobic training on body composition, aerobic power and some women-hormones in polycystic ovary syndrome infertile women." The Iranian Journal of Obstetrics, Gynecology and Infertility (2016;19:1-10.)

4- In contrast, the 2011 study reported no change in BW during the 16-week aerobic intervention, as pointed out by the reader. Their findings could be the result of a number of factors, including a very small sample size (n = 8). (Please see reference: Fertil Steril. 2011;95:2696-9. doi: 10.1016/j.fertnstert.2011.01.137.)

However, in another study, 16 weeks of progressive aerobic exercise resulted in a decrease in body mass index, waist circumference, and improvement in iHRQL, cardiorespiratory fitness, and cardiometabolic profile among overweight/obese women with PCOS. (Please see reference: Costa EC, DE Sá JCF, Stepto NK, Costa IBB, Farias-Junior LF, Moreira SDNT, Soares EMM, Lemos TMAM, Browne RAV, Azevedo GD. Aerobic Training Improves Quality of Life in Women with Polycystic Ovary Syndrome. Med Sci Sports Exerc. 2018 Jul;50(7):1357-1366. doi: 10.1249/MSS.0000000000001579. PMID: 29443823).