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OPEN PEER REVIEW

Comparative Effects of Moderate Intensity Continuous Training and High Intensity Interval Training on Serum Levels of Myonectin in Rats

Hadi Safarpour, Alireza Safarzade, Ali Delpisheh

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About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

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1 Original submission

1 comment · 14 Jun 2024

Elham Shakerian Reviewer

MAJOR REVISION 14 Jun 2024

-In the Discussion and conclusion section, previous studies have been fully mentioned, but it is better to write and discuss more about your research.

-In Tables 2 and 3, it is better to write fasting plasma glucose instead of glucose.

-In the Discussion and Conclusion section, omit the word conclusion. You wrote conclusion at the end of the article.

-You said myonectin (CTRP15) is related to the regulation of glucose metabolism. As you know, HBA1C is an important factor for doctors because it shows the average glucose level over the last 3 months.

-Why did you not measure HBA1C, as you did fasting plasma glucose, in your groups?

-As you said, myonectin is correlated with physical activities and nutrition, and throughout the research period, the animals had free access to water and food. Were the food and calorie intakes the same for all mice? Did you consider this point?

-What is the scientific reason that eight weeks of HIIT decreased serum insulin levels and HOMA-IR compared to both the control and MICT groups? How do you explain these changes?

-Why did you choose male rats for this study? Did you use a human or rat kit?

-Why were blood sampling and tissue collection performed 72 hours after the last exercise session? What is the reason for this timing?

-According to your study and reference 31, which stated that an adverse correlation was identified between myonectin concentration and glucose levels, HOMA-IR score, and adipose weight, do you think myonectin can be used as a drug to reduce blood sugar in metabolic disorders like type 2 diabetes?

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Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Thank you for the opinions of the judges and the esteemed editor.

-In Discussion and conclusion part, the previous studies have been fully mentioned, but it is better to write and discuss more about your research.

In the discussion section, we discussed the results from the perspective of comparing several similar studies, and also discussed possible mechanisms of change, but it was revised according to the opinions of the respected reviewers.

-In Tables 2 and 3, it is better to write fasting plasma glucose instead of glucose

Following the opinion of the respected referee, the word glucose has been changed to fasting serum (blood) glucose. We cannot use the word plasma glucose because the sample does not contain an anticoagulant and serum and plasma differ in the presence or absence of clotting factors.

-In the Discussion and Conclusion part, omit the conclusion word . you wrote conclusion at the end of the article

Has been corrected

-You said myonectin (CTRP15) is related to the regulation of glucose metabolism. As you know HBA1C is an important factor for doctors because it shows the average of glucose in 3 last months

Hemoglobin A1c (HbA1c) is a test that measures the amount of blood sugar (glucose) attached to red blood cells. Haemoglobin is the part of red blood cells that carries oxygen from the lungs to the rest of the body. This test measures the amount of glycosylated haemoglobin in the blood. This type of haemoglobin is formed in the blood when the protein in the red blood cells responsible for carrying oxygen combines with free sugar in the blood. This sugar is carried by the blood to all parts of the body. The presence of sugar in some organs can cause serious effects and problems in the patient. Although myonectin is a myokine.

-why did not you measure HBA1C like fasting plasma glucose in your groups?

The aim of our research and the main variable was to look at changes in myonectin. There have been many studies looking at HBA1C.

-As you said,myonectin is correlated with physical activities and nutrition, and Throughout the research period, the animals had free access to water and food. were the food and calorie intake the same for all mice?Did you consider this point?

Yes, all animals in the same food groups were fed the same type of food

-What scientific reason is there that Eight weeks of HIIT decreased serum insulin levels and HOMA-IR compared to both control and MICT groups? how do you explain these changes?

Considering that HIIT and MICT have different exercise intensities and respiratory exchange ratios (RER) that end up with the utilization of predominantly different energy sources, i.e. carbohydrates and fats respectively, it would be expected that HIIT and MICT have different effects on glycaemic and

cardiometabolic risk factors for individuals with T2DM (McArdle et al, 2010; Metcalfe et al, 2012; Wilmore et al, 2008). There are studies in the literature that compare the effects of HIIT versus MICT or non-exercising controls in the moderate or long term, and energy expenditure was not the principal object in most of them (Alvarez et al, 2016; Backx et al, 2011; Hollekim-Strand et al, 2014; Maillard et al, 2016; O'Donovan et al, 2005; Ruffino et al, 2017; Winding et al, 2018).

Some causes for these modifications are :Insulin Sensitivity Improvement: HIIT enhances insulin sensitivity by increasing glucose uptake in muscle cells. This effect is partly due to improved GLUT4 translocation to the cell membrane, allowing efficient glucose transport. The lactate produced during HIIT activates autophagy pathways, which contribute to insulin sensitivity1.

Metabolic Adaptations: HIIT promotes mitochondrial biogenesis and oxidative capacity. Increased mitochondrial function enhances glucose utilization and reduces insulin resistance. HIIT-induced adaptations in skeletal muscle improve insulin signaling pathways, leading to better glucose homeostasis.

Fat Profile Alterations: HIIT reduces visceral fat and improves lipid profiles. Lower LDL cholesterol and atherogenic index contribute to better metabolic health. These changes may be linked to increased lipolysis during HIIT sessions.

-Why did you choose male rats for this study? did you use a human or rat kit?

No, the kit in use has the following specifications:

Rat Myonectin (CTRP15), Eliza Kit, EASTBIOPHARM .Sensitivity: 0.026 ng/ml. Intra-Assay: CV<10% .Inter-Assay: CV<12%

Rat Insulin (INS), Eliza Kit, EASTBIOPHARM. Sensitivity: 0.05mIU/L. Intra-Assay: CV<10%. Inter-Assay: CV<12%

-Why were Blood sampling and tissue collection performed 72 hours after the last exercise session? what is the reason for this time?

The timing of blood sampling and tissue collection 72 hours after the last exercise session is strategic. Here’s why:

Recovery Period: After intense exercise, the body undergoes various physiological changes. Waiting 72 hours allows for recovery from acute exercise-induced stress, minimizing confounding effects. During this time, inflammation subsides, and metabolic processes stabilize.

Inflammatory Response: Exercise triggers an inflammatory response, including cytokine release. By waiting 72 hours, researchers capture the post-exercise inflammatory peak and subsequent resolution. This window provides insights into immune modulation and tissue repair.

Muscle Adaptations: Muscle repair and remodeling occur during this period. Gene expression related to muscle growth, protein synthesis, and mitochondrial biogenesis peaks around 48–72 hours post-exercise. Collecting samples at this time reveals these adaptations.

Metabolic Changes: Hormonal fluctuations (e.g., growth hormone, cortisol) stabilize. Insulin sensitivity improves, and glucose homeostasis normalizes. Waiting 72 hours ensures a stable metabolic state for accurate measurements.

In summary, the 72-hour window balances capturing acute exercise effects and allowing recovery.

-According to your study and refrence31 that said an adverse correlation was identified between myonectin concentration and glucose levels, HOMA-IR score, and adipose weight, do you think myonectin can be used as a drug to reduce blood sugar in metabolic disorders like diabetes 2?

However, the purpose of the study of reference number 31 in the case of the Investigate the link between physical activity and insulin resistance, inflammation, coagulation, and fibrinolytic biomarkers in individuals at high risk for type 2 diabetes12. Cross-sectional analysis of 778 subjects aged 40-70 years from the RIAD study4. High physical activity is associated with lower insulin resistance, leukocyte count, hs-CRP, and fibrinogen levels. A trend towards decreased PAI-1 and tPA levels was noted with increased physical activity5. Physical activity independently influences insulin resistance and certain inflammatory biomarkers, while only a tendency is observed for coagulation and fibrinolytic biomarkers32.

In fact, physical exercise is widely accepted as a clinical modality to prevent type 2 diabetes (T2DM) and decrease blood glucose concentrations in people with T2DM . For many years, muscle has been thought to be an important secretory organ. Cytokines and other peptides produced and secreted by myocytes are classified as "myokines".

2 Revision 1

0 comments

No public comments in this round.