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Influences of Exercise on Circulating Irisin in Overweight or Obese Individuals: a system review

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Objective Irisin is a newly identified myokine, which is mainly secreted by skeleton muscle, adipose and cerebellar. It is shown to be related to some physiology process. The aim of this study is to evaluate the influence of exercise on circulating irisin concentrations in overweight or obese individuals

Methods Searches were performed on nine online electronic databases including PubMed, EMBASE, The Cochrane Library, web of science, Ebsco, CNKI, VIP, CBM and Wan-Fang Data databases. The search items were irisin, fibronectin type III domain-containing protein 5, FNDC5, exercise, training, physical activity, obesity, overweight, obese, body mass index, BMI, adiposity and fat. Randomized controlled trials (RCT) or clinical controlled trials about the effect of exercise on circulating irisin concentrations in overweight or obese individuals in English or Chinese were eligible for the study. The trials compare exercise intervention with no intervention, or combined interventions of exercise and other with other intervention(s), and the exercise intervention is not one acute time. Besides, the trial objects belong to overweight or obese regardless of the judgement's indicator. According to the criteria, the data extracted by two research independently. If there was disagreement, discussion between all the authors were used to settle. The risk of bias among the included studies was assessed by the Cochrane Collaboration Risk-of-Bias tool, which consists of seven domains and each one was judged to 'unclear risk', 'low risk', or 'high risk' following the recommendations detailed of the Cochrane handbook. Lastly an analysis about the final studies was done.

Results The search identified a total of 855 possible articles. Of those, 364 were removed as duplicates, and the remaining 491 were screened for the titles and abstracts. The full-texts of 56 trials were retrieved to assess for eligibility. After the evaluation, four articles of RCTs were retained for the final system review from the year of 2015 to 2017, producing 6 study estimates. The assessments class of methods quantity of them are A. All the research subjects are more than 18 years old, and in one study subjects are men, men and women in two, women in three. The types of exercise intervention are dissimilar, such as strengthen or endurance exercise (including high intensity interval training, HIIT). In the duration of exercise, three studies are 8 weeks, and two for 12 weeks, one for 24 weeks. In circulating irisin, the detection methods of all is enzyme-linked immunosorbent assay, and three are in plasma, three in serum. Furthermore, the concentration unit in five studies is ng/ml, and one is µg/ml. Bonefate suggests that aerobic exercise with the frequency of 3 times per week for 24 week maintains plasma FNDC5/irisin of middle-age obese men, same as 8 weeks aerobic exercise for overweight/obese adults by Kim, but three is an opposite result from Wu, which proved that aerobic exercise of twelve weeks ascends serum irisin of young obese women. HIIT of eight or twelve weeks ascends serum irisin in sedentary obese women or young obese women according to Tofighi or Wu suggestion. Moreover, resistance exercise of 8 weeks significantly increases plasma irisin of overweight/obese adults From Kim's study.

Conclusions The study about effect of exercise on circulating irisin levels in overweight or obese individuals is not sufficient to come to a positive result, although the quality assessments of current evidences are high. Basing on the available literatures, exercise can maintain or improve circulating

irisin levels in overweight or obese individuals. The effect needs to be illustrated by further RCTs with large sample size.