INPLASY PROTOCOL

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None declared.

Effect of exercise on inflammatory markers in overweight and obese adults. Inplasy protocol

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Review question / Objective: **To examine the effects of exercise on inflammatory markers in overweight and obese adults.**
Condition being studied: **We are going to explore whether overweight and obese adults can reduce inflammatory markers following an exercise intervention of at least 2 weeks in duration.**
Information sources: **Two review team members will independently screen the titles and abstracts of the retrieved publications to select the eligible publications. A third review team member will act as a referee in case of a disagreement between the review team members. We will also ensure that any retracted publications are identified and excluded from the selection outcome. Furthermore, we will locate the full texts that will not be immediately accessible via emails to the lead authors and/or journals of publication. A full list of the excluded publications will be provided in the final version of the systematic review.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 March 2021 and was last updated on 23 March 2021 (registration number INPLASY202130084).

INTRODUCTION

Review question / Objective: **To examine the effects of exercise on inflammatory markers in overweight and obese adults.**

Rationale: **Overweight and obesity have grown to a worldwide pandemic, affecting nearly two billion people. They are associated with a plethora of chronic diseases such as cardiovascular disease, type II diabetes and various types of**

cancer. Chronic low grade inflammation has been implicated as the common mechanism linking obesity to the aforementioned diseases. The beneficial effects of exercise have been acknowledged, focusing mostly on increased energy expenditure and consequent weight loss. There are several trials that examined the effects of exercise on inflammatory markers in overweight and obese individuals; however, their results are conflicting. Therefore, a systematic review and meta-analysis may provide useful evidence for clinical practice.

Condition being studied: We are going to explore whether overweight and obese adults can reduce inflammatory markers following an exercise intervention of at least 2 weeks in duration.

METHODS

Search strategy: A systematic literature search will be conducted by two researchers using the following databases: PubMed, The Cochrane Library (trials) and SportDiscus. Disagreements regarding the included studies will be discussed and settled by a third reviewer. We will use a combination of Medical Subjects Headings (MeSH) and free text words to complete the literature search, adapted to each database, which will include the following key words: 1) “exercise”, “physical activity”, “training”, “sport”, “motor activity”, “fitness”, “active”, 2) “inflammation”, “inflammatory”, “CRP”, “c reactive protein”, “IL-6”, “Interleukin-6”, “TNF-a”, “TNF-alpha”, “tumor necrosis factor alpha” 3) “overweight”, “obese”, “obesity” and 4) “randomized control trial”, “randomized controlled trial”, “clinical trial”. We will also check the reference lists of included articles or relevant reviews to identify additional eligible publications.

Participant or population: Overweight and/or obese adults according to World Health Organization (WHO) criteria body mass index (BMI)>25 kg/m2.

Intervention: One or more types of exercise, such as aerobic exercise, resistance exercise or combined (aerobic and resistance) exercise with a duration of ≥ 2 weeks.

Comparator: Control/no exercise.

Study designs to be included: Randomized controlled trials and/or controlled trials including one or more arms of exercise therapy and one control arm will be included.

Eligibility criteria: To be eligible for inclusion in the meta-analysis, studies will need to meet the following criteria: 1) peer reviewed publications, 2) publications in any language, 3) involving human participants, 3) participants should be adults (≥18 years old) and overweight or obese according to WHO criteria (BMI>25 kg/m2), 4) randomized or controlled trials comparing at least one exercise intervention with a control group, 5) provide measures of at least one of the following inflammatory markers C-reactive protein (CRP), interleukin-6 (IL-6) and tumor necrosis factor-α (TNF-α) and 6) with the length of the intervention lasting ≥ 2 weeks.

Information sources: Two review team members will independently screen the titles and abstracts of the retrieved publications to select the eligible publications. A third review team member will act as a referee in case of a disagreement between the review team members. We will also ensure that any retracted publications are identified and excluded from the selection outcome. Furthermore, we will locate the full texts that will not be immediately accessible via emails to the lead authors and/or journals of publication. A full list of the excluded publications will be provided in the final version of the systematic review.

Main outcome(s): Main outcomes will include the well-established inflammatory markers TNF-a, IL-6, CRP.

Data management: Two review team members will independently extract data from the eligible publications in an appropriate table. In case of disagreement

a referee investigator will make an ultimate decision regarding the data that should be extracted. A priori pilot data extraction will be used, to ensure a comprehensive data extraction process. In case that data are missing from a paper we will contact via email the corresponding author to retrieve them. The data that will be included in the final data extraction table are: 1. First author name and year of publication, 2. Methodological design, 3. Population characteristics, 4. Intervention, 5. Main outcomes.

Quality assessment / Risk of bias analysis: The risk of bias assessment will be performed by two independent assessors, while a third investigator will act as a referee. According to the methodological design of each eligible study we will use the Cochrane library tool for assessing the risk of bias in randomized controlled trials and the ROBINS-I tool for assessing the risk of bias in studies of non-RCT nature that used an intervention (controlled trials). The results of the risk of bias assessment will be extracted in relevant tables and figures.

Strategy of data synthesis: For the eligible studies that will provide available and/or suitable data for a meta-analysis, a continuous, random or a fixed-effect meta-analysis model will be used to account for heterogeneity due to differences in study populations, type of intervention, study duration and other factors. All meta-analyses will be conducted using the RevMan 5.4 software.

Subgroup analysis: Subgroup analysis will include analyses of different categories for age, gender, BMI, BMI change, type and duration of intervention.

Sensitivity analysis: In case that the data of the eligible publications are suitable, we will assess the applicability of the findings of the systematic review via the Grading of Recommendations Assessment, Development and Evaluation (GRADE) analysis.

Language: No language limits will be applied.
Country(ies) involved: Greece, USA.

Keywords: exercise; physical activity; inflammation; inflammatory; overweight; obesity.

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