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REVIEW

Should resistance training programs aimed at muscular hypertrophy be periodized? A systematic review of periodized versus non-periodized approaches

Les entraînements en résistance pour hypertrophier le muscle doivent-ils être fractionnés ? Une revue systématique des approches fractionnées versus non fractionnées

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Summary

Objectives. – Our goal was to systematically review the current literature and interpret the findings regarding the effects of periodized (PER) versus non-periodized (NP) resistance training programs aimed at muscular hypertrophy.

News. – Controversy exists as to whether a (PER) approach to resistance training is superior to a (NP) approach for maximizing muscular hypertrophy, or vice-versa, or if no differences exist between the approaches.

Prospect and projects. – Following a search of the PubMed/MEDLINE, Scopus, and Web of Science electronic databases, 12 studies comprising a total of 31 treatment groups met pre-determined inclusion criteria.

Conclusion. – Based on the results of our review, we conclude that similar hypertrophic effects may be achieved using either a PER or a NP approach. Importantly, the findings are specific to short-term training interventions, as the average duration of programs across studies amounted

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to ~15 weeks; and to untrained individuals, as only two studies involved resistance-trained participants. A limitation of the reviewed literature also pertains to the small number of studies ($n = 3$) using direct measures of hypertrophy (i.e., magnetic resonance imaging or ultrasound). Further research is needed to fill in the gaps in the current literature.

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Résumé Notre objectif était de réaliser une revue systématique de la littérature actuelle et d'interpréter les résultats concernant les effets hypertrophians musculaires des entraînements en résistance fractionnés (FR) versus non-fractionnés (NF). En effet, il existe une controverse quant à savoir si une approche (FR) des entraînements en résistance est supérieure à une approche (NF) pour maximiser l'hypertrophie musculaire ou vice versa ou si aucune différence n'existe entre les approches.

Méthodologie.—À la suite d'une recherche dans les bases de données électroniques PubMed/MEDLINE, Scopus et Web of Science, 12 études comprenant 31 groupes de traitement répondent à des critères d'inclusion prédéterminés.

Résultats.—Sur la base de l'analyse de ces études, nous concluons que des effets hypertrophiques similaires peuvent être atteints en utilisant une approche FR ou NF. Il faut noter que ces résultats ne concernent que des entraînements à court terme (la durée moyenne des programmes étant d'environ 15 semaines) et des sujets préalablement non entraînés (à l'exception de deux études portant sur des sujets déjà entraînés en résistance). Une autre limitation de la littérature étudiée est qu'elle ne comprend qu'un faible nombre d'études ($n = 3$) qui utilisent des mesures directes de l'hypertrophie (imagerie par résonance magnétique ou échographie). D'autres recherches sont donc nécessaires pour combler les lacunes de la littérature actuelle.

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1. Introduction

The inclusion of resistance training as a part of a well-designed exercise program is recommended by many public health organizations, including World Health Organization, American College of Sports Medicine, and American Heart Association. Resistance training offers multiple health benefits including improvements in physical performance, longer functional independence, and increases in cognitive abilities and self-esteem [1]. A common goal of individuals participating in resistance training is to increase muscle mass. The current body of literature provides empirical evidence regarding a majority of resistance training variables (i.e., intensity, volume, exercise selection, etc.) oriented towards achieving such a goal [2]. However, there is a paucity of evidence regarding how to manipulate these variables for optimal results. This strategy referred to as periodization is regarded as a fundamental component of the training process as it may provide a conceptual structure for devising a training plan [3].

A training program may be periodized (PER) using one or more conventional periodization models. These models include:

- linear periodization (LP), characterized by increases in training intensity and decreases in training volume over time, or, reverse linear (RL), characterized by decreases in intensity and increases in volume;

- daily undulating periodization (DUP) characterized by undulation in intensity and volume each training day, weekly undulating periodization (WUP) or the undulating model (UP), characterized by weekly or biweekly fluctuation in intensity and volume, respectively;
- the block periodization (BP) model that divides the training program into several blocks that focus on specific training goals.

Some authors [4] have proposed that the use of a DUP resistance training program provides greater benefits for achieving increases in muscle mass than the utilization of an LP resistance training program. However, it is currently unknown if a resistance training program aimed at muscular hypertrophy should be periodized using either of the above-discussed models or a non-periodized (NP) program with high levels of training volume and progressive overload is sufficient to elicit hypertrophic effects.

By synthesizing the available data and conducting a systematic review, it is possible to glean further insights into the topic and thus draw evidence-based conclusions for resistance training program design. In accordance, the objective of this paper is: to evaluate the effects of PER versus NP resistance training programs on measures of muscle hypertrophy by systematically reviewing the current body of literature and present practical information for individuals striving to optimize resistance training programs aimed at increases in muscle mass.

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