THE ANTI-INFLAMMATORY EFFECT OF EXERCISE IN THE ACUTE AND CHRONIC PHASE DURING COLON TUMORIGENESIS

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INTRODUCTION

Colon cancer is the third most common type among men and women, being the fourth leading cause of death for all cancers.[1] The estimate for Brazil between the years 2016 and 2017 was an average of 16,660 new cases of colorectal cancer in men and 17,620 in women.[2] There is a strong association between chronic inflammation and neoplastic colon mechanisms.

Several epidemiological and pre-clinical studies supported the idea that physical activity has protective effect against the incidence of cancer.[3,4] Their biological mechanisms are, but not limited to, including decreased inflammation and modulated immune function, hormonal processes and anti-inflammatory cytokines release.[5,6] New evidence suggest a potential time-recovery effect of exercise on pro and anti-inflammatory cytokines.[7]

The phase of chronic and acute exercise training represent two distinct situations with different changes in blood results. In the chronic phase reduced adiposity and an improved lean mass are observed, which may lead to are reduction in the basal concentrations of circulatory sex hormones, metabolic hormones and inflammatory factors. In contrast, in the acute phase of exercise there are transient increases in markers such as circulating hormones, cytokines and immune cells.[8] which may link as augmented cytotoxic capacity. However, there is no information whether exercise may differ from acute and chronic stages in a colon tumor mouse formation.

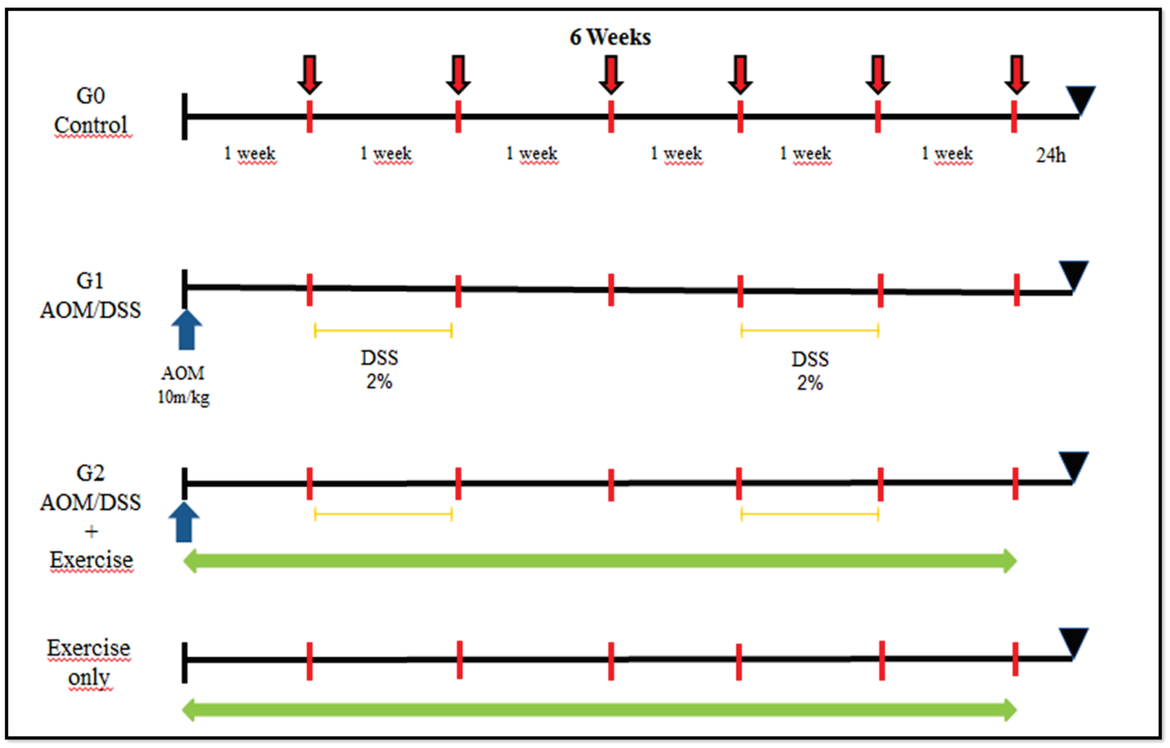
These data point to the need for further studies to elucidate and ensure exercise as a potential cancer control treatment, in order to identify the transient cytotoxic effects of exercise on colon tumor formation.

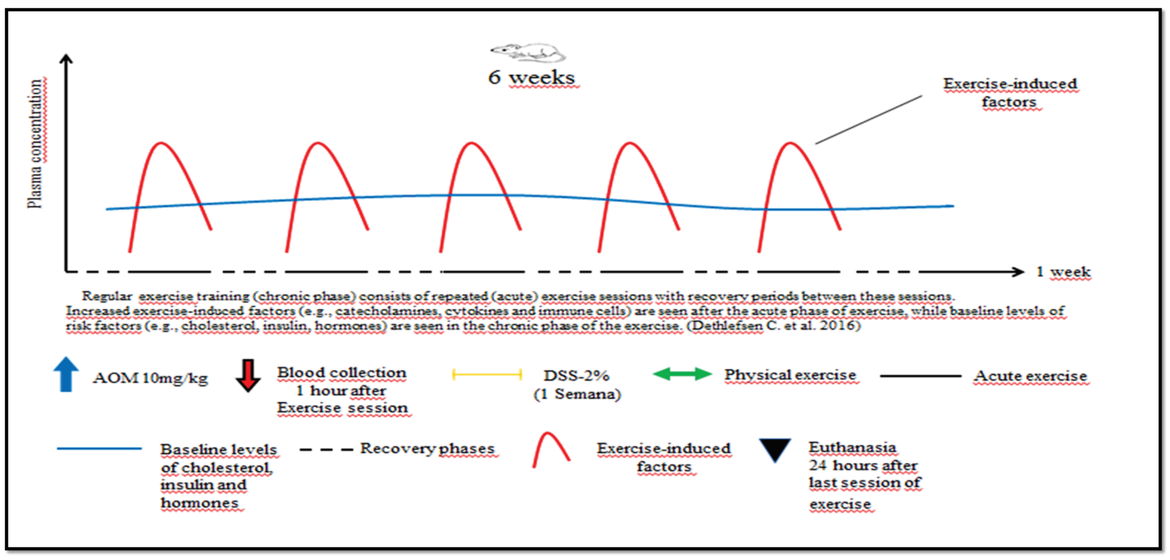
OBJECTIVE

We aim to investigate whether acute and chronic recovery stages may alter the inflammatory environment, and if during the acute-recovery stage exercise may have a greater cytotoxic effect than in the chronic stage.

METHODOLOGY

A total 32 balb/c mice (adults male, 6 weeks old) either treated with carcinogenic inducer azoximethane (AOM) and inflammatory promoter dextran sodium sulfate (DSS) or control, will be divided into 4 groups (n=8): G0 (control) without exposure to AOM/DSS; G1 (AOM/DSS) exposure AOM/DSS; G2 (AOM/DSS + exercise) and G3 (exercise only). Blood from the animals will be collected weekly after acute (1 hour) or chronic (24 hour) exercise session. The protocol of aerobic physical exercise will be the modality of swimming, (5x week, for 6 weeks).





Adapted from: Hojman P. 2017; *Biochemical society transactions 2017*

HYPOTHESIS

Due to increasing findings of the positive effects of exercise on chronic inflammation, the present study hopes to better understand the mechanism by which exercise modulates anti-inflammatory responses, and whether these responses occur more immediately (acute phase) having a more cytotoxic effect, or whether it occurs through na accumulation of these (chronic) exercise sessions.

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