

Modulatory effects of leucine and polyunsaturated omega-3 fatty acid in Walker-256 tumour-bearing rats from mothers subjected to nutritional supplementation.

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Abstract

Cancer is one of the main cause of death and being the cachexia state responsible for 25% of deaths. This project evaluated the efficiency of nutritional supplementation with leucine and/or omega-3 fatty acid on preventing or minimizing the damage effects caused by Walker-256 carcinoma growth in adult rats from mothers subjected to these nutritional schemes during the pregnancy and weaning period. The main proposal was to study the possible epigenetics effects in tumour growth and its effects in hepatic tissue.

Key words: cancer, cachexia, nutritional supplementation.

Introduction

Cancer is the second cause of death in world. Cancer-cachexia is characterized by low anabolism and high catabolism, including high depletion of carbohydrate and lipids reserves and, mainly, protein mass. Meanwhile, the nutritional supplementation can be a co-adjuvant alternative to preserve or revert the cachectic state. Knowing that leucine has a signaling cellular property, and omega-3 fatty acid improves the host immune response, this project evaluated the efficiency of nutritional supplementation during pregnancy and weaning period on preventing or modulating the effects caused by Walker-256 carcinoma growth in adults rats, accessing the tumour growth and liver and muscle weights.

Results and Discussion

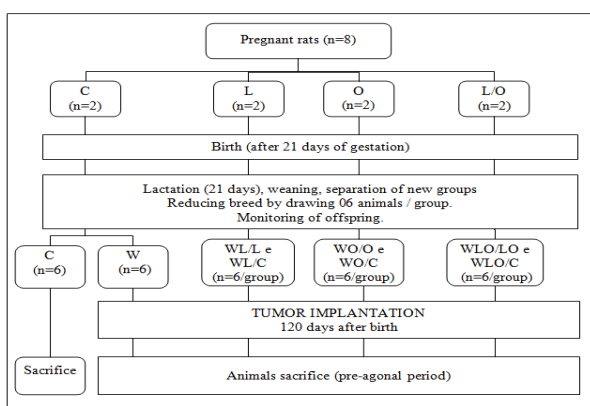


Figure 1. Experimental procedure. After mating, pregnant rats and their offspring were subjected to leucine and/or omega-3 rich-diets until adulthood. Adult males were implanted with 2×10^6 Walker-256 tumour viable cells in right subcutaneous. ⁽²⁾Total of animals per group (n=6 males).

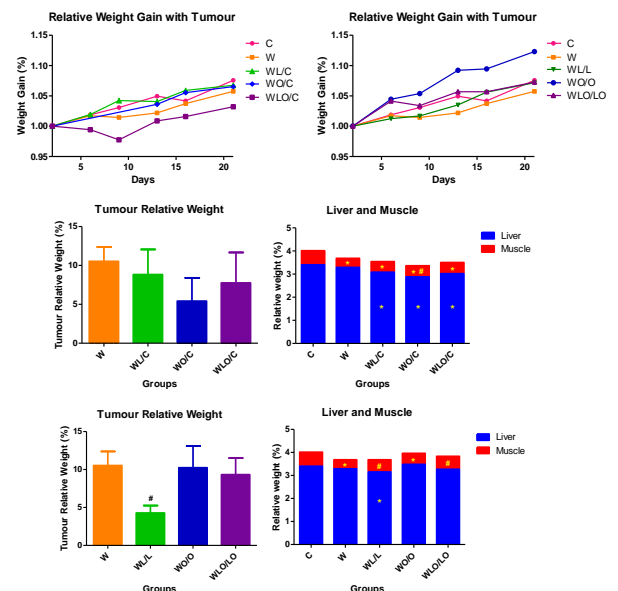


Figure 2. Body weight gain evolution and Relative weight of tumour, liver and muscle (* $p < 0,05$ statistical difference from C; # $p < 0,05$ statistical difference from W).

Conclusions

Taking all results together, it is possible to suggest that the nutritional supplementation with leucine was responsible for lower tumour growth and muscle mass maintenance. Same profile about muscle was verified in the groups which were supplemented with omega-3 fatty acid and/or leucine.

Acknowledgement

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¹ Organização Mundial de Saúde (OMS) - <http://www.who.int/mediacentre/factsheets/fs297/en/index> acessado em 14/07/2015.
² Tisdale MJ. Cachexia in Cancer Patients. Nature Reviews Cancer 2 Nov. 2002, 862-871..