Diet and Exercise in Colon Cancer Progression

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Colorectal Cancer (CRC), representing roughly 10% of cancer deaths, is associated with risk factors such as physical inactivity, inflammation, and diets high in fat. Aberrant crypt foci (ACF), clusters of abnormal glands along the colons lining, can be induced by azoxymethane (AOM). AOM induced ACF are used as biomarkers to assess murine colon progression. The lymphatic system, which filters bacteria and some cancer cells throughout the body, is one of the most important prognostic factors in colon cancer progression. The aim of my study was to understand how diet and exercise affect ACF formation in a preclinical model, in order to translate effective treatment regimens to a clinical setting. Colons from C57/6N mice, used in another researcher's work, were obtained. The C57/6N mice previously were divided into control diet, high-fat diet, and exercise groups and then underwent azoxymethane injections. The colons were used for ACF and polyp enumeration and RNA extraction. RNA quantification and reverse transcription led to quantitative real-time PCR evaluating gene expression. ACF formation was more in mice with a high-fat diet, but not statistically different from the exercise group. Non-lymph associated ACF were significantly greater in high-fat diet than control diet. Lymph associated ACF was significantly less in the exercise group compared to the high-fat diet group. My data indicates that exercise may not play a role in normal colon cancer progression after a patient has cancer, but plays a protective role in colon cancer metastasizing to the lymphatic system. Cyp2e1 mRNA levels did not differ between groups indicating that the treatment did not affect the metabolism pathway of AOM.

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