HUMAN ASCARIASIS AS A RISK FACTOR FOR BREAST CANCER PROGRESSION: THE LINK BETWEEN INFECTION, INFLAMMATION AND LUNG METASTASIS IN A MURINE MODEL

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Human ascariasis is a neglected disease with significant socioeconomic impact. Studies suggest that helminths can influence the development of cancers, including breast cancer. We believe that this relationship has some risk, due to *Ascaris* spp. constant contact with society and the environment, thus modulating the immune response and the possible tumor microenvironment. We investigated the relationship between *Ascaris suum* infection, breast cancer progression, and its lung metastases. For this purpose, female BALB/c mice were infected with 250 larval eggs of *A. suum*. After 14 days, they received $1x10^6$ 4T1 cells subcutaneously in the right flank to induce breast cancer. Tumor growth and survival were evaluated. After 21 days, some of the animals were euthanized for analysis of bronchoalveolar lavage by flow cytometry, lung histopathology, and cytokine quantification. For better accuracy in detecting lung metastases, a solution containing 100 µCi of the 99mTc-HYNIC-βAla-Bombesin(7-14) complex was administered intravenously to a portion of the animals, and scintigraphic images were obtained four hours after administration. The findings indicated that the infection decreased survival of animals with cancer and contributed to tumor growth and the appearance of ulcerated areas. Radioisotope experiments revealed greater lung metastasis area, confirmed by histopathology that showed increased metastatic foci count, which resulted in an increase in tissue lesion score, metastatic foci, and total diameter area. Cytokine analysis indicated a significant reduction in IL-10, IL-5, and IL-13 and a significant increase in IL-17, TNF-α, and TGF-β. Bronchoalveolar lavage revealed changes compatible with clinical worsening and we observed that there was no increase in the intensity of inflammatory cells in animals previously infected. We conclude that prior infection with *A. suum* at low doses can aggravate breast cancer and its prognosis in mice due to chronic inflammation.

Supported by: FAPEMIG, CNPq and CAPES.

Keywords: Nematodes, tumor microenvironment, neglected diseases.