

EXERCISE TRAINING AS A POTENTIAL THERAPEUTIC AGENT FOR PROSTATE NEOPLASIA IN A RAT MODEL OF PROSTATE CANCER: NEW INSIGHTS INTO AN ENIGMA

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Introduction: Exercise training is widely recognized for its beneficial health outcomes, namely in prostate cancer (PCa). This study aimed to evaluate the effect of exercise training on dorsolateral prostate lobe lesions in a rat model of chemically and hormonally induced prostate cancer.

Material & methods: Fifty-five male Wistar Unilever rats (*Rattus norvegicus*) of 12 weeks of age were randomly divided into four groups: control sedentary (n=10), PCa-sedentary (n=15), control exercised (n=10) and PCa-exercised (n=20). Animals from exercised groups started the exercise training in a treadmill (Treadmill Control LE 8710, Harvard Apparatus, USA), at the age of 8 weeks, for 35 weeks (5 days/week). The PCa induction protocol consisted of flutamide (50 mg/kg, TCI Chemicals) administration for 21 consecutive days, followed by a single administration of *N*-methyl-*N*-nitrosourea (30 mg/kg, Isopac®, Sigma Chemical Co.) and testosterone propionate implants. Animals were sacrificed at 61 weeks of age. The dorsolateral prostate tissues sections were processed for light microscopy and classified histologically according to Bosland [1]. Data were analysed using SPSS 25 and values were statistically significant at $p < 0.05$.

Results: Identified lesions were classified as dysplasia, prostatic intraepithelial neoplasia (PIN) and microinvasive carcinoma. Although control animals also developed prostate lesions, the frequency was lower than in induced groups. The PCa-induced animals showed a slightly decrease in the frequency of lesions: animals from PCa-sedentary group showed 85.7% of dysplasia, 64.3% of PIN and 64.3% of microinvasive carcinoma ($p > 0.05$) and animals from PCa-exercised group showed 70.0% of dysplasia, 58.8% of PIN and 58.8% of microinvasive carcinoma ($p > 0.05$). All animals from all groups on study showed inflammation on the dorsolateral prostate acini. Inflammation was higher in PCa-exercised dorsolateral prostate than in PCa-sedentary (100% and 57.1%, respectively, $p < 0.05$).

Conclusions: Dysplasia, PIN and microinvasive carcinoma on dorsolateral prostate were observed in all groups on study; though the frequencies were slightly lower in exercised PCa-induced animals than in sedentary ones, data didn't achieve statistical significance. However, our results suggest that exercise training may have some preventive effect on the PCa-lesion's development. These data deserve more investigation to clarify the effect of exercise training on prostate cancer prevention.

References: [1] Bosland MC. Proliferative Lesions of the Prostate and Other Accessory Sex Glands in Male Rats. Society of Toxicologic Pathologists; 1998.

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