

Physical exercise in a chemically and hormonally-induced rat model of prostate cancer: friend or foe?

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Introduction: Physical exercise is widely recognized for its beneficial health effects, namely in prostate cancer (PCa). This study aimed to evaluate the effect of physical exercise in a rat model of chemically and hormonally induced PCa.

Material and methods:

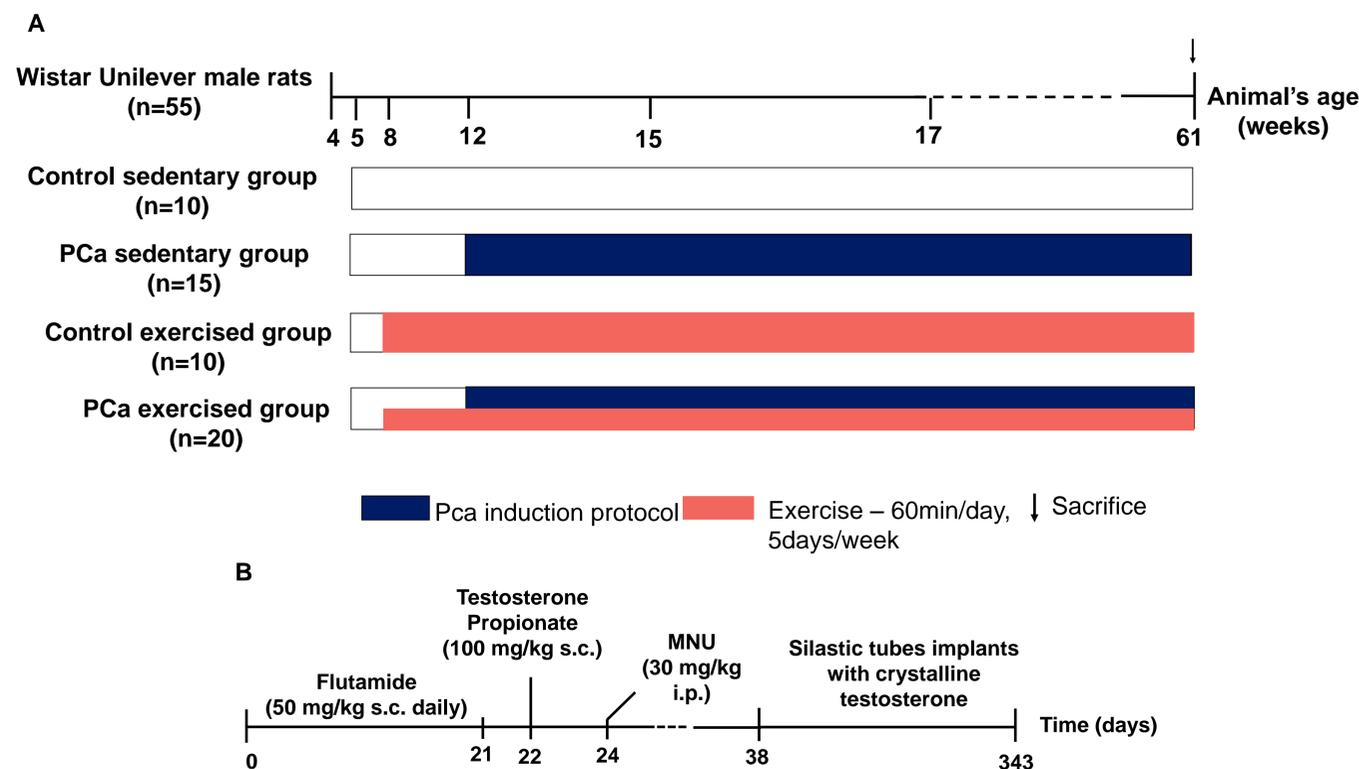


Figure 1. A - Experimental protocol; **B** - PCa induction protocol.

Results: Body weight was lower in exercised groups than in sedentary, either in control or in PCa groups ($p < 0.05$) (Fig. 2). PCa and exercise training increased the prostate relative weight ($p < 0.05$, Fig.2). These results were expected due to the practice of exercise training and similar to published works in exercised PCa models. CRP, albumin and TWEAK serum concentration did not show significant differences between sedentary and exercised groups (Fig.3). 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 (Table 1). 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 ($p > 0.05$).

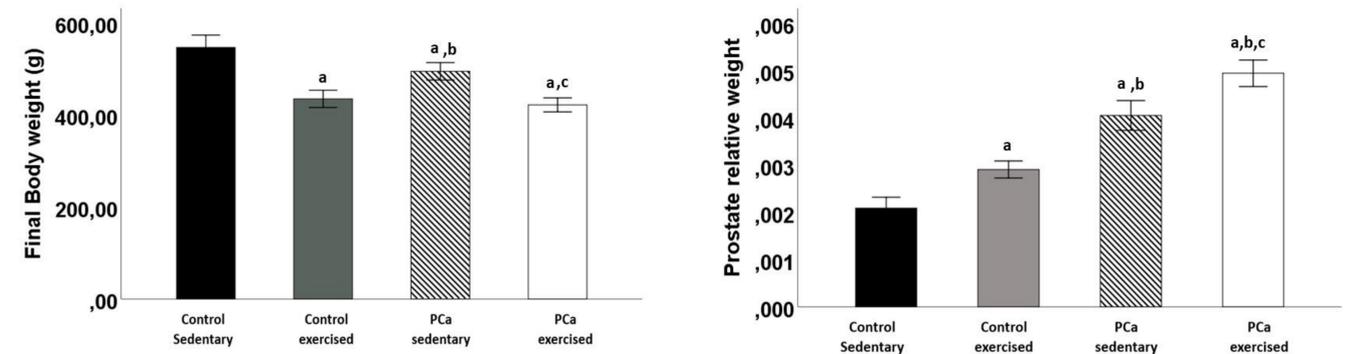


Figure 2 Animal body weight at sacrifice and prostate relative weight (mean \pm SE). ^astatistically different from control sedentary group ($p < 0.05$); ^bstatistically different from control exercised group ($p < 0.05$); ^cstatistically different from Pca-sedentary group ($p < 0.05$).

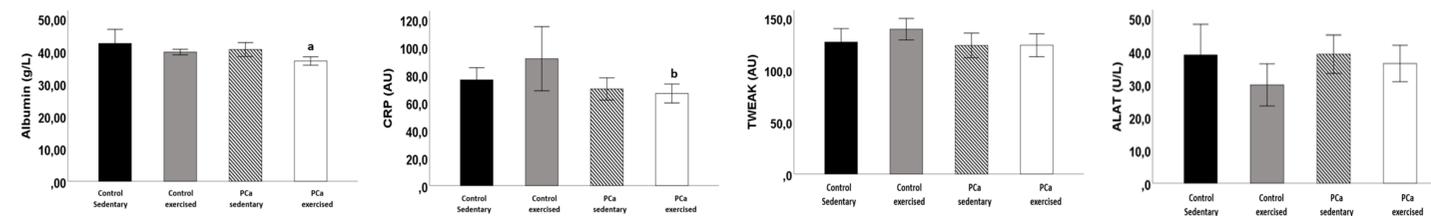


Figure 3 Serum parameters (mean \pm SE). ^astatistically different from Control sedentary group ($p < 0.05$); ^bstatistically different from Control exercised group ($p < 0.05$); AU - arbitrary units.

Table 1 Number of animals (%) with dorsolateral histological lesions (mean \pm SE).

	Control Sedentary (n=10)	Control exercised (n=10)	PCa-sedentary (n=14)	PCa-exercised (n=17)
Dysplasia	4 (40.0)	4 (40.0)	12 (85.7) ^a	15 (70.0) ^b
PIN	1 (10.0)	2 (20.0)	9 (64.3) ^a	10 (58.8)
Microinvasive carcinoma	0 (0.0)	1 (10.0)	9 (64.3) ^a	10 (58.8) ^b

^a $p < 0.05$ statistically different from Control sedentary group; ^b $p < 0.05$ statistically different from Control exercised group

Conclusions: No group showed systemic signs of inflammation or clinical abnormalities. Although the prostate lesions frequencies were slightly lower in exercised PCa-induced animals than in sedentary ones, data didn't achieve statistical significance. However, our results suggest that physical exercise 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.

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