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:

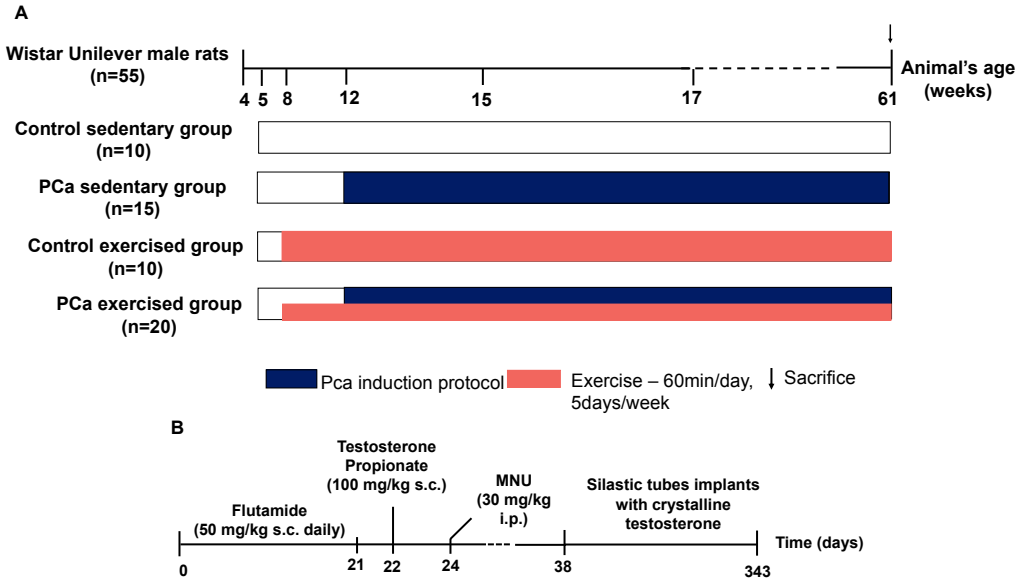

Figure 1. A - Experimental protocol; **B -** PCa induction protocol.

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).

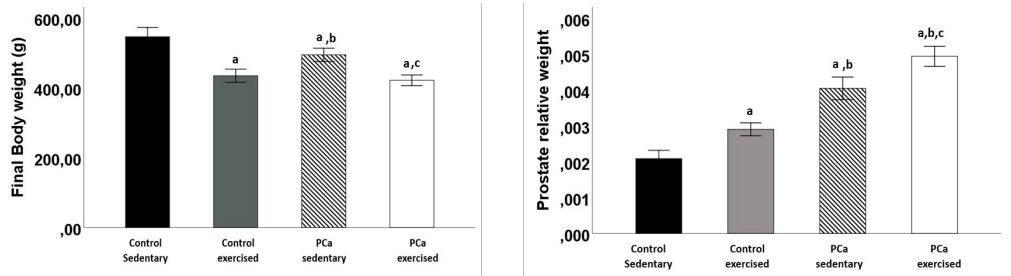

Figure 2 Animal body weight at sacrifice and prostate relative weight (mean ±SE).
[a]**statistically different from control sedentary group (p<0.05); [b]statistically different from control exercised group (p<0.05); [c]statistically different from Pca-sedentary group (p<0.05).**

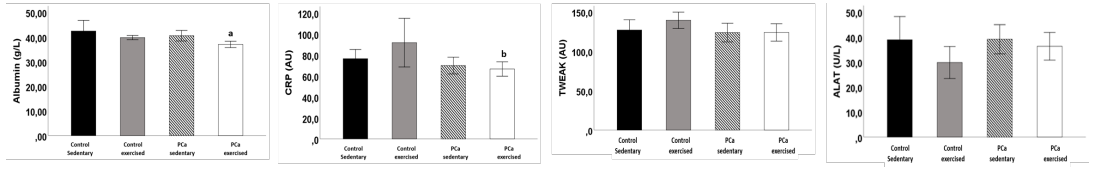

Figure 3 Serum parameters (mean ±SE).
[a]statistically different from Control sedentary group (p<0.05); [b]statistically different from Control exercised group (p<0.05); AU - arbitrary units.

Table 1 Number of animals (%) with dorsolateral histological lesions (mean ± 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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