EXERCISE AND CALORIE RESTRICTION ATTENUATES CISPLATIN-INDUCED ACUTE KIDNEY INJURY.

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Introduction:

Cisplatin treatment has been adopted in some chemotherapies; however, this drug can induce acute kidney injury due its ability to negatively affect renal function. Inflammation and apoptosis is the general cause of cisplatin-inducing acute kidney injury. Several works showed that exercise and calorie restriction are two good tools to modulate inflammatory response, diminishing apoptosis and expression levels of pro-inflammatory cytokines. It s well estabilished that those interventions can revert the inflammation in cardiovascular disease, obesity, diabetes and many others.

Goals:

To investigate if exercise, calorie restriction and both combined interventions could be handfull tools to attenuates the nephrotoxic effects caused by the treatment with cisplatin.

Methodology:

Mice were separated in 5 different groups; Cisplatin treatment group that was submmited to 20mg/kg of cisplatin, Exercise group that was submmited to swimming training and treated with 20mg/kg of cisplatin, Calorie Restriction group, that was submmited to 30% of food restriction and treated with 20mg/kg of cisplatin, Exercise + Calorie Restriction group that was submmited to swimming training, 30% of food restriction and 20mg/kg of cisplatin, and control group that received saline 0.9%.

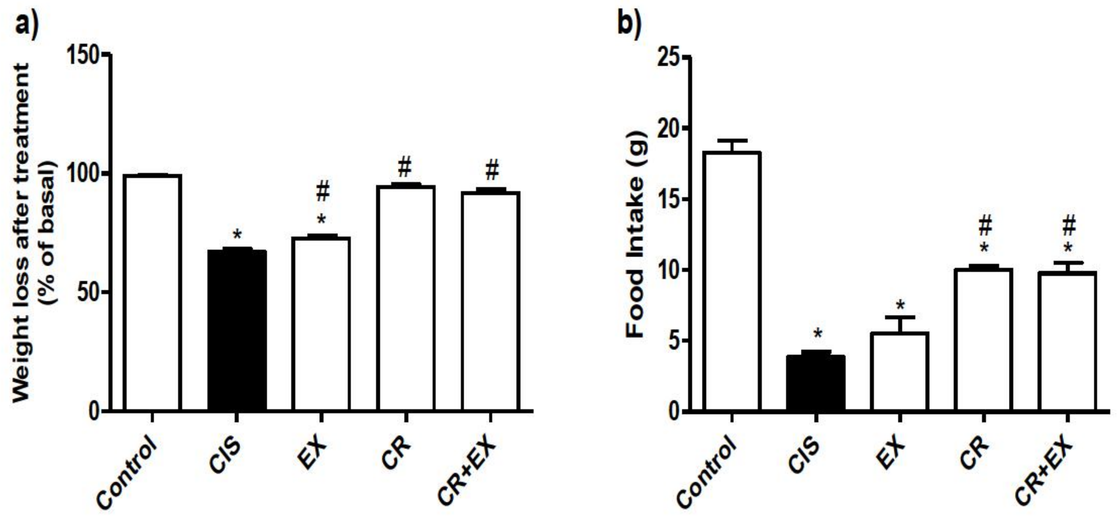

Figure 1: (A) weight loss after cisplatin treatment **(B)** food intake during 4 days of cisplatin treatment *p<0,05 vs WT #p<0,05 vs WT CIS

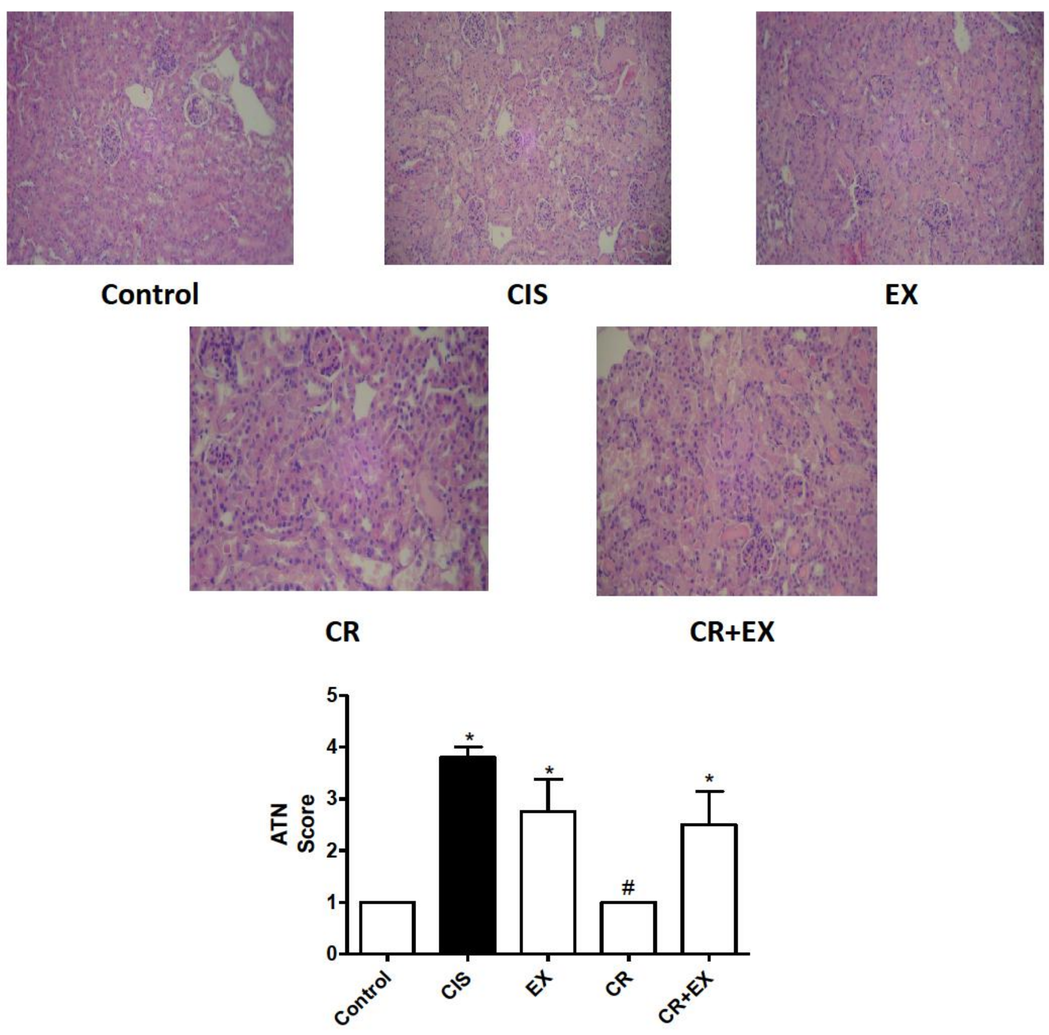

Figure 2: Representative pictures of kidney slices. The pictures were taken with an original magnification of 100. *p<0,05 vs WT #p<0,05 vs WT CIS

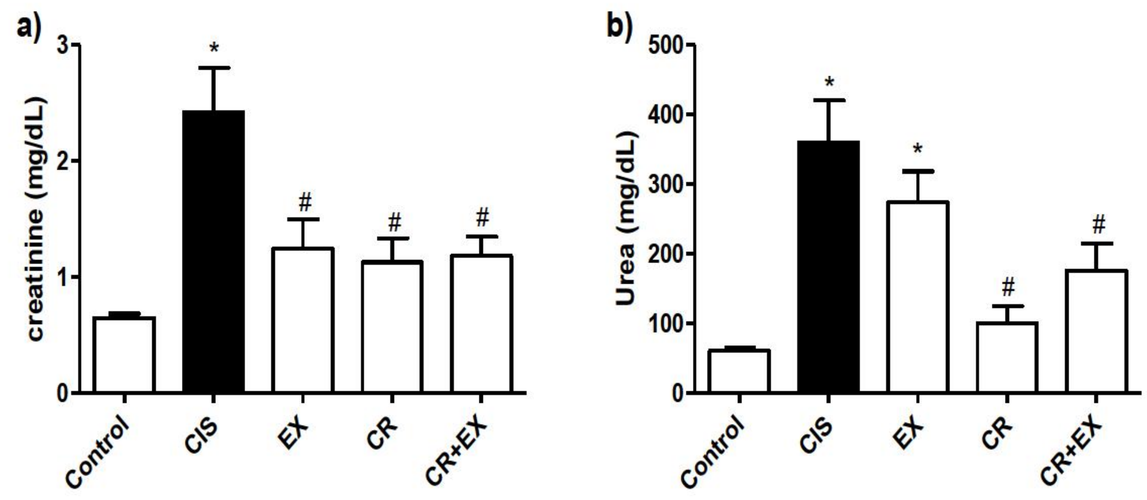

Figure 3: (A) serum creatinine **(B)** blood urea after 96 hours *p<0,05 vs WT #p<0,05 vs WT CIS

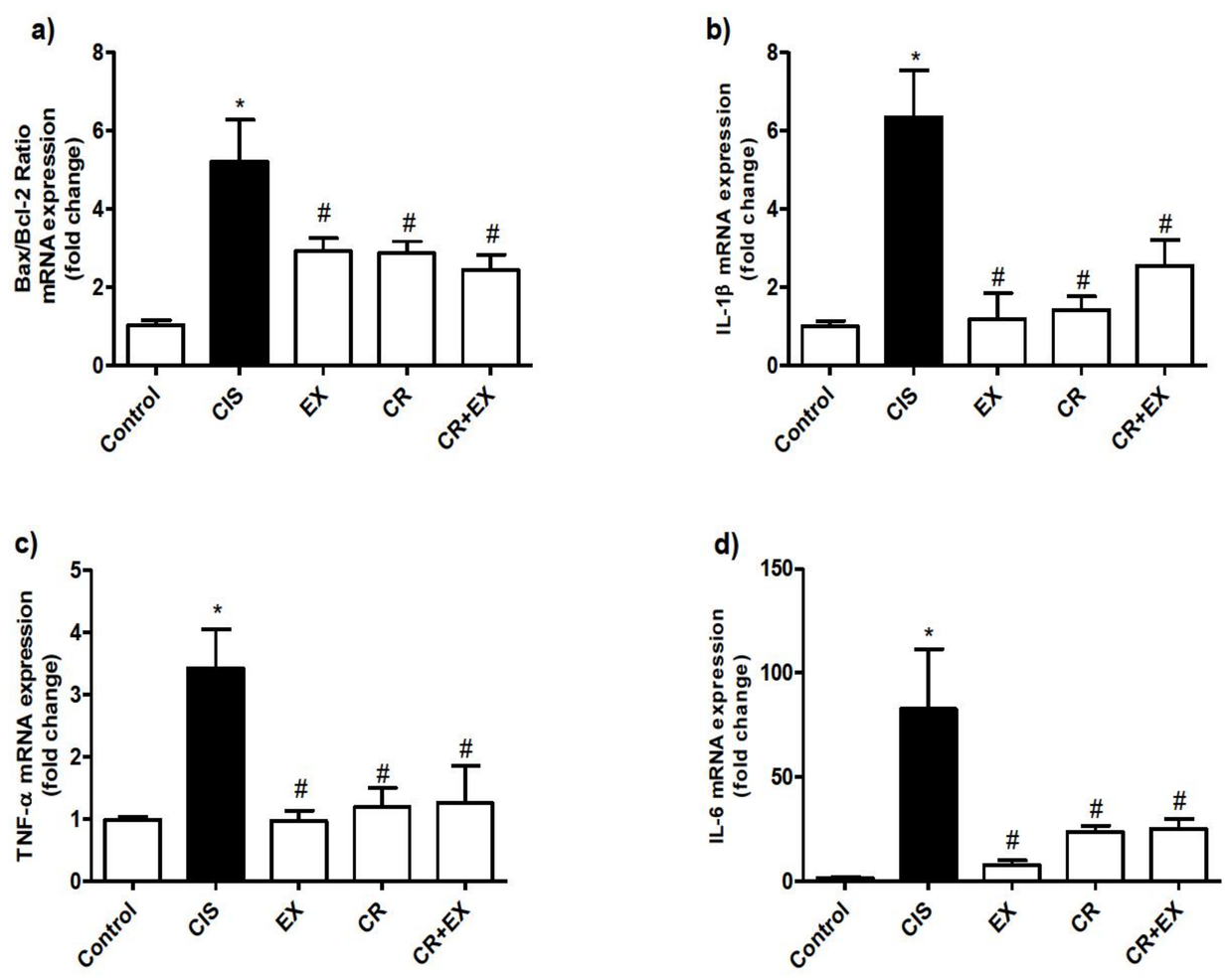

Figure 4: (A) Gene expression bax:bcl-2 ratio **(B)** IL-1β **(C)** TNF-α **(D)** IL-6 in renal tissue after 96 hours of cisplatin injection *p<0,05 vs WT #p<0,05 vs WT CIS

Results:

Cisplatin treatment causes body weight loss and diminishes food intake, the calorie restriction and exercise + calorie restriction groups were able to reverse this side effects. Moreover cisplatin administration leads to renal dysfunction augmenting creatinine and urea levels, all three treatments were capable to maintain creatinine levels at basal state and only the exercise group were not able to prevent the higher levels of urea. Additionally those treatments can attenuates mRNA expression of pro-inflammatory cytokines levels.

Conclusion:

Our data suggest that calorie restriction shows to be more effective to prevents acute kindey injury. More experiments are necessary to better understand the mechanism underlying these effects and why exercise can only attenuates at molecular levels.

Grants:

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