



A Randomized Control Trails for the Assessment of Impact of Moderate Intensity Exercise on Blood Serum Creatinine Concentration among the Male Athletes

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Authors' contributions

This work was carried out in collaboration among all authors. Authors AK and MZIB designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MZIB, AM, SB, FW and MJ managed the analyses of the study. Author MZIB managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Purpose: The main purpose of the study was to examine the impact of moderate intensity exercise on blood serum creatinine concentration among the male.

Method & Materials: A randomized control trails were conducted for purpose to evaluate the effects of moderate intensity exercise on creatinine level among the subjects (Experimental Group

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(EG) = 10, Control group (CG). A written informed consent from all the subjects and ethical approval was taken from Gomal University Ethical Review Committee before initiating the study protocols. 5ml blood were taken from all the subjects and each blood sample was marked with separate identification code. Twelve weeks exercise (moderate intensity exercise) protocols was employed on the selected subjects. The collected blood samples were tested and thus the collected results were processed through Statistical Package for Social Sciences (SPSS, Version, 24) by applying Mean and Standard deviation etc.

Results & Conclusion: On the basis of analysis, the researcher concluded that inferentially there is no significant effect of moderate intensity exercise on BMI and Creatinine of the subjects but descriptively the experimental group shows better results in BMI and Creatinine (after the treatment)

Keywords: Moderate intensity exercise; kidney; creatinine.

1. INTRODUCTION

The waste product produced by muscles during break down of compound cells called creatine which is removed by the kidney and thus almost all of it from the blood and release it into the urine. It can measure through urine and blood test. Both test are considered very effective [1,2]. The amount of creatinine relatively depends on your body size and your muscle mass and thus creatinine levels are usually slightly higher in men as compared to women and children [3,4].

During exercise particularly during muscular contraction, the body produce creatine and creatinine at a relatively constant rate. In addition creatinine is cleaned or filtered from the blood through kidney and released into urine [5,6,7]. Hypertension which is considered a psychological concern and mainly associated with Creatinine. To maintain the level of Creatinine, exercise is testified as aide therapy for hypertension. It means that exercise maintain the level of creatinine [8].

Genetics is also factor associated with high blood pressure and high level of creatine kinase predominantly in vascular and cardiac muscle tissue among the black people of sub-Saharan African [9]. The author further argued that such greater activity of creatine kinase has been testified in skeletal muscle of black untrained subjects (sub-Saharan African) and has also been reported to be almost twice the activity found in white subjects. Age, gender, dietary pattern, muscle mass and ethnicity all are the genetical factors effecting the level of serum creatinine. Similarly serum creatinine is a early predictor of kidney function [10,11].

Muscle mass greatly influence the serum creatinine level but not cystatin C; therefore the

authors [12] further stated that consumption of cystatin may characterize a more adequate alternative to assess the kidney function in healthy people with higher muscle mass and potential mild kidney impairment or problems. Exercise may cause an increase in net protein and creatinine exertion. In addition sweat losses are also important way for urea exertion during activity or exercise similarly rise in the level of protein catabolism, protein is only a slight source of energy during light to moderate exercise [13].

2. PURPOSE OF THE STUDY

In consist of the previous studies (Calles-Escandon et al. 1984., Goldberg & Finkelstein 1987., Shemesh 1985., Brewster et al. 2000., Baxmann et al. 2008, Perrone, et al. 1992), this research study was basically carried out for the purpose to examine the impact of moderate intensity exercise on blood serum creatinine concentration among the Male Athletes.

3. OBJECTIVES OF THE STUDY

This research study was basically carried out for the purpose to

1. examine the impact of moderate intensity exercise on blood serum creatinine concentration among the Male Athletes

4. METHODS AND MATERIALS

4.1 Trails Design

In the current research study, a randomized control trails were conducted for the purpose to examine the impact of moderate intensity exercise on blood serum creatinine concentration among the Male Athletes.

4.2 Subjects

The participants of the study were consisted of 20 untrained females voluntarily selected from the department of sports sciences & physical education Gomal University Dera Ismail Khan, KP, Pakistan. (Experimental Group (EG) = 10, Control group (CG). All the participants were informed about the risk factors of the study protocols.

4.3 Inclusion Criteria

On the basis of the below creteria, the subjects were included in the study

1. The study who voluntarily participate in the study
2. The subject having no chronic health problems
3. The subject having age from 20 to 30 years
4. The subjects using no medicine

4.4 Randomization of Subjects

The age of the subjects were arranged in ascending order such from 20 to 30 years and thus they were divided into two group's i.e Experimental Group (EG) and Control Group (CG)

5ml blood were taken from all the subjects and each blood sample was marked with separate identification code.

4.5 Research Intervention

A Self-adminstrated 12 weeks low intensity exercise protocols was developed and applied on the participants. Participants (EXG) were acquiesced to a 50 minutes low intensity exercise session of twelve week (initial 5 minutes warmup including normal jogging and stretching exercise, training session lasted for 35 minutes and ended with 10 minutes relaxation phase (Cooling down). The volume and intensity of exercise were kept accordance with criteria of Maximum Heart Rate (Low intensity exercise is that which gets you to about 40-50 percent of your Maximum Heart Rate (MHR).

The data collected during pre and posttest were processed through statistical package for social sciences (SPSS, version.24) and were analyzed by using Mean, Standard deviation etc. as a statistical tools.

4.6 Presentation of Data

The data shows that the mean age of the experimental group before the treatment was 21.4 years, the weight mean was 67.2 kg, the mean height was 170.18 cm, and mean BMI in pretest was 23.28 and mean Creatinine before the treatment was 0.74.

The data shows that the mean age of the experimental group after the treatment was 21.4 years, the weight mean was 64.4 kg, the mean height was 170.18 cm, and mean BMI in posttest was 22.2 and mean Creatinine after the treatment was 0.88.

Table 1. Experimental group pretest of Creatinine with anthropometric measures

#	Code	Age (years)	Weight (kg)	Height (cm)	BMI/Pre	Creatinine before
1	A1	22	65	172.72	21.78	0.7
2	A2	21	82	170.18	28.31	0.7
3	A3	22	70	167.64	24.90	0.9
4	A4	21	60	170.18	20.71	0.7
5	A5	21	59	170.18	20.73	0.7
Average		21.4	67.2	170.18	23.28	0.74

Table 2. Experimental group posttest of Creatinine with anthropometric measures

#	Code	Age (years)	Weight (kg)	Height (cm)	BMI/Post	Creatinine after
1	A1	22	63	172.72	21.1	0.8
2	A2	21	78	170.18	26.9	1.0
3	A3	22	65	167.64	23.1	1.1
4	A4	21	58	170.18	20.0	0.7
5	A5	21	58	170.18	20.0	0.8
Average		21.4	64.4	170.18	22.2	0.88

Table 3. Control group pretest of creatinine with anthropometric measures

S/No	Code	Age (years)	Weight (kg)	Height (cm)	BMI/Pre	Creatinine before
1	B1	24	92	185.42	26.75	0.7
2	B2	23	78	175.26	25.39	0.7
3	B3	22	90	170.18	31.07	0.7
4	B4	23	75	185.88	21.70	0.8
5	B5	23	65	162.56	24.59	0.7
Average		23	80.0	175.86	25.9	0.72

Table 4. Control group posttest of Creatinine with anthropometric measures

S/No	Code	Age (years)	Weight (kg)	Height (cm)	BMI/Post	Creatinine after
1	B1	24	92	185.42	25.75	0.8
2	B2	23	78	175.26	25.39	0.9
3	B3	22	90	170.18	31.07	0.7
4	B4	23	75	185.88	21.70	0.7
5	B5	23	66	162.56	25.97	0.8
Average		23	80.2	175.86	25.97	0.78

The data shows that the mean age of the control group before the treatment was 23 years, the weight mean was 80.0 kg, the mean height was 175.86 cm, and mean BMI in pretest was 25.9 and mean Creatinine before the treatment was 0.72.

The data shows that the mean age of the control group after the treatment was 23 years, the weight mean was 80.2 kg, the mean height was 175.86 cm, and mean BMI in posttest was 25.97 and mean Creatinine after the treatment was 0.78.

The data in the Table 5 shows that there is no significant difference between experimental group ($M= 23.28\pm 3.28$) and control group ($M= 25.90\pm 3.43$) in BMI before the treatment $t_8 = -1.230$, $Sig. = .254 > \alpha = .05$. Similarly, data also indicates that there is no significant difference between experimental group ($M= 22.22\pm 2.90$) and control group ($M= 25.97\pm 3.34$) in BMI after

the treatment $t_8 = -1.897$, $Sig. = .094 > \alpha = .05$. The data in the Table 5 shows that there is no significant difference between experimental group ($M= 0.74\pm 0.04$) and control group ($M= .72\pm 0.04$) in Creatinine before the treatment $t_8 = .447$, $Sig. = .667 > \alpha = .05$. Similarly, data also indicates that there is no significant difference between experimental group ($M= .88\pm 0.16$) and control group ($M= .78\pm 0.08$) in Creatinine after the treatment $t_8 = 1.213$, $Sig. = .260 > \alpha = .05$. The researcher concluded that inferentially there is no significant effect of moderate intensity exercise on BMI and Creatinine of the subjects but descriptively the experimental group shows better results in BMI and Creatinine (after the treatment) due to moderate intensity exercise 8 weeks protocol.

The data shows that there is significant difference between the BMI score of experimental group before ($M= 23.28\pm 3.28$) and after ($M= 22.22\pm 2.90$) the treatment,

Table 5. Independent sample t-test showing the mean difference between experimental group and control in BMI and Creatinine in before and after the treatment

Testing variables	Groups	N	Mean	SD	T	Sig.
BMI Pre	EXP:	5	23.2860	3.28947	-1.230	.254
	Control	5	25.9000	3.43029		
BMI post	EXP:	5	22.2200	2.90637	-1.897	.094
	Control	5	25.9760	3.34019		
Creatinine pre	EXP:	5	.7400	.08944	.447	.667
	Control	5	.7200	.04472		
Creatinine post	EXP:	5	.8800	.16432	1.213	.260
	Control	5	.7800	.08367		

Table 6. Paired sample t-test showing the mean difference between pretest and posttest score of BMI and Creatinine of experimental group

Testing variables	Mean	N	Std. deviation	T	Sig.	
Pair 1	Body Mass Index Pre	23.2860	5	3.28947	4.662	.010
	Body Mass Index post	22.2200	5	2.90637		
Pair 2	Creatinine pre	.7400	5	.08944	-2.746	.042
	Creatinine post	.8800	5	.16432		

Table 7. Paired sample t-test showing the mean difference between pretest and posttest score of BMI and Creatinine of control group

Testing variables	Mean	N	Std. deviation	T	Sig.	
Pair 1	Body Mass Index Pre	25.9000	5	3.43029	-.200	.851
	Body Mass Index post	25.9760	5	3.34019		
Pair 2	Creatinine pre	.7200	5	.04472	-1.177	.305
	Creatinine post	.7800	5	.08367		

Experimental group shows better results in BMI after the treatment $t_4 = 4.66$, $Sig. = .010 < \alpha = 0.05$. The data shows that there is significant difference between the Creatinine score of experimental group before ($M = .74 \pm 0.089$) and after ($M = .88 \pm 0.164$) the treatment, Experimental group shows better results in Creatinine after the treatment $t_4 = -2.746$, $Sig. = .042 < \alpha = 0.05$. Hence the researcher concluded that there is significant effect of Moderate intensity aerobic exercise 8 weeks protocol on the BMI and Creatinine of experimental group.

The data shows that there is no significant difference between the BMI score of control group before ($M = 25.90 \pm 3.43$) and after ($M = 25.97 \pm 3.34$) the treatment, control group shows same results in BMI after the treatment $t_4 = -.200$, $Sig. = .851 > \alpha = 0.05$. The data shows that there is no significant difference between the Creatinine score of control group before ($M = .72 \pm 0.044$) and after ($M = .78 \pm 0.083$) the treatment, Control group shows same results in Creatinine after the treatment $t_4 = -1.177$, $Sig. = .305 > \alpha = 0.05$. Hence the researcher concluded that there is significant effect of Moderate intensity aerobic exercise 8 weeks protocol on the BMI and Creatinine of experimental group because control group shows similar results after 8 weeks without treatment.

5. MAJOR FINDINGS

1. The data analysis found that there is no significant difference between experimental group ($M = 23.28 \pm 3.28$) and control group ($M = 25.90 \pm 3.43$) in BMI before the treatment.

2. The researcher found that there is no significant difference between experimental group ($M = 22.22 \pm 2.90$) and control group ($M = 25.97 \pm 3.34$) in BMI after the treatment.
3. The researcher found that there is no significant difference between experimental group ($M = 0.74 \pm 0.04$) and control group ($M = .72 \pm 0.04$) in Creatinine before the treatment.
4. The researcher found that there is no significant difference between experimental group ($M = .88 \pm 0.16$) and control group ($M = .78 \pm 0.08$) in Creatinine after the treatment.
5. The researcher concluded that inferentially there is no significant effect of moderate intensity exercise on BMI and Creatinine of the subjects but descriptively the experimental group shows better results in BMI and Creatinine (after the treatment) due to moderate intensity exercise 8 weeks protocol.
6. The researcher found that there is significant difference between the BMI score of experimental group before ($M = 23.28 \pm 3.28$) and after ($M = 22.22 \pm 2.90$) the treatment, Experimental group shows better results in BMI after the treatment
7. The researcher found that there is significant difference between the Creatinine score of experimental group before ($M = .74 \pm 0.089$) and after ($M = .88 \pm 0.164$) the treatment, Experimental group shows better results in Creatinine after the treatment.
8. The researcher found that there is significant effect of Moderate intensity

aerobic exercise 8 weeks protocol on the BMI and Creatinine of experimental group.

9. The researcher found that there is no significant difference between the BMI score of control group before ($M=25.90\pm3.43$) and after ($M=25.97\pm3.34$) the treatment, control group shows same results in BMI after the treatment.
10. The researcher found that there is no significant difference between the Creatinine score of control group before ($M=.72\pm0.044$) and after ($M=.78\pm0.083$) the treatment, control group shows same results in Creatinine after the treatment.
11. The researcher concluded that there is significant effect of Moderate intensity aerobic exercise 8 weeks protocol on the BMI and Creatinine of experimental group because control group shows similar results after 8 weeks without treatment.

6. CONCLUSIONS

On the basis of data analysis and findings of the study the researcher concluded that there is no significant difference between experimental group and control group in BMI before the treatment. Similarly, the researcher reached at the fact there is no significant difference between experimental group and control group in BMI after the treatment. The researcher also concluded that there is no significant difference between experimental group and control group in Creatinine before the treatment. Similarly, the researcher concluded that there is no significant difference between experimental group and control group in Creatinine after the treatment. The researcher concluded that inferentially there is no significant effect of moderate intensity exercise on BMI and Creatinine of the subjects but descriptively the experimental group shows better results in BMI and Creatinine (after the treatment) due to moderate intensity exercise 8 weeks protocol. The researcher concluded that pretest and posttest of experimental group in BMI and Creatinine was significantly different and found better in posttest after the treatment score which support the descriptive results on the other hand control group was found same in pretest and posttest BMI and Creatinine tests.

CONSENT AND ETHICAL APPROVAL

A written informed consent from all the subjects and ethical approval was taken from Gomal University Ethical Review Committee before initiating the study protocols.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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