

Extreme Endurance Affects on Creatine Kinase (CK) Levels in Cross Functional Athletes, Military Warfighters and Firefighters

As reported by the national media*, Rhabdomyolysis (Rhabdo) is an increasingly, alarming topic among the cross functional community, the military warfighters and firefighters. While this topic is not new to the military warfighters and firefighters, it is taking the cross functional community by surprise. Unlike the day-to-day occupational hazards the military warfighters and firefighters face, this unique style of training has many cross functional athletes discussing the possible repercussions that come with it, namely Rhabdo. Given the growth of the sport and the continued scrutiny that comes with the sport, this disease now has it's own mascot, Rhabdo the Clown.

With the growth of these communities, we must probe the question, how can this condition be prevented? A scientific study on this dangerous medical condition was recently completed and the results of the study were astonishing. Yes, you can continue doing the cross functional training and reduce your chances of acquiring Rhabdo at the same time. Through the use of proper supplementation, military warfighters and firefighters may have the same opportunity to lower CK levels as the cross functional athletes who participated in this study.

Rhabdo is a dangerous medical condition often associated with strenuous exercise and overuse, crush injuries, elevated or reduced sodium levels, low potassium, unusually high or low body temperature, particular medications, and dehydration (or a combination of factors). And up until now, military warfighters and firefighters were the only groups worried about Rhabdo. We can now add the cross functional athletes to the list impacted by this medical condition.

The breakdown of muscle tissue results in damaged cells entering the blood stream. Myoglobin, a toxic protein released by these cells, is harmful to the kidneys when released in large quantities and can lead to permanent kidney damage, or even kidney failure. Rhabdo is often diagnosed by measuring an enzyme released into the blood by damaged muscle tissue, creatine kinase (CK). It is not abnormal to see CK levels rise above 100,000 U/l in Rhabdo cases.

In 2007, an independent third party conducted a scientific study on a product formulated for the athletic community by Xendurance. The product is an all natural sports supplement called Extreme Endurance. This study showed after just a 10 day use of Extreme Endurance, athletes reduced their lactic acid by 15% and increased their aerobic threshold by double digits. The athletes also reported less muscle soreness and had quicker recoveries.

The results of the study and several other studies, along with the recent media attention with Rhabdo, led Xendurance to a hypotheses. Xendurance believed Extreme Endurance could lower CK levels. To prove these assumptions, in January 2014, a scientist named Jürgen Sessner conducted another test on Extreme Endurance.

In this Open label test, changes in CK levels were tested after a 7-day supplementation period on Extreme Endurance. A group of 31 cross functional athletes, both men and women, ranging in age (from 20 to 48) were chosen for the study. Prior to participating, all athletes who were using Extreme Endurance underwent a 2-week washout period. All the athletes were required to perform "Fran" twice over the course of an 8-day period.

On the first test day, athletes completed "Fran". "Fran" is one of the best known workouts among cross functional athletes. Fran is a back-to-back exercise of a 21-15-9 repetition scheme of front squats thrusters and pull-ups. Due to the metabolic efficiencies needed to complete "Fran" and the physiological response that it elicits, Xendurance once again chose this epic workout for this CK study. After completing the first "Fran" workout, each athlete received their 7-day trial of Extreme Endurance. They were instructed to take a dosage of 3 tablets in the morning, and 3 in the evening, while keeping their current diet and training schedule unchanged. On day 8, the participants returned to complete the second test.

On each testing day, CK levels were tested via blood taken from the index finger and analyzed by a Reflotron Plus System (37°C) immediately pre and post "Fran".

To place Fran in perspective, the increased CK levels associated with Fran could be equivalent to the CK levels a firefighter may experience on the front lines fighting a fire or a Military Warfighter on a 10 mile trek with full equipment. All three events have the ability to increase your CK level.

Results:

Upon analysis of the data, the results showed that after a 7-day supplementation period on Extreme Endurance, a decrease by an average of 16.9% (33.1 U/l) in CK levels pre-workout and a 63.55% (32.6 U/l) decrease in CK levels after completing Fran were recorded. In addition, none of the athletes who participated recorded CK levels that would indicate the onset of Rhabdo. 29 of 31 athletes performed better in the second workout with an average of 8.55% or 32 seconds faster.

A clearly recognizable lowering of beginning CK levels were evident before the second workout. As noted, the results showed a lower entry of 16.9% or 33.1 U/l.

After completing the second workout, the data showed additional reduction of CK levels of 63.55% or 32.6 U/l. And 29 of 31 athletes performed better in the second workout with an average of 8.55% or 32 seconds faster, all 31 athletes reported a quicker recovery and less muscle soreness.

Summary:

By looking at the results from this open label test, it can be concluded that Extreme Endurance is affective in decreasing muscle trauma and decreasing recovery time as indicated by lower CK levels. This means less cell damage, safer training, and a quicker recovery and allows more training load in both short and long term.

Equipment:

CK analysis by Reflotron (Enzymatic testing system at 37*) *Footnotes:

Extreme exercise can introduce dangerous health risk for some KTVU San Francisco-Jan 31, 2014

Health issue 2014: High intensity workouts, rhabdo, and what you ... C-VILLE Weekly-Jan 29, 2014

CrossFit: Too Much of a Good Thing Is Definitely Bad Huffington Post-Jan 28, 2014

FOX 5 Investigates: CrossFit Concerns MyFox Washington DC-Feb 5, 2014

4 senior enlisted counseled after 2013 chief-select PT fiasco Military Times-Jan 30, 2014

Rhabdomyolysis: The New Fire Service Issue - Washington Fire Chiefs www.washingtonfirechiefs.com/.../Rhabdomyolysis--The-New-Fire-Service Aug 8, 2013

Lessons Learned Review: Rhabdomyolysis leading to heat stroke ... wildfiretoday.com/.../lessons-learned-review-rhabdomyolysis-leading-to-heat-stroke? Sep 4, 2013

Hawaii not immune to Crossfit craze Hawaii News Now-Feb 8, 2014

CrossFit can offer amazing results, just know your limits WFSB-Jan 30, 2014

CrossFit debate not going away ESPN-Feb 10, 2014

Workout injuries: Listen to your body, not mind El Paso Inc.-Feb 2, 2014

Xendurance Crossfit CK Study



Results Test 1 and 2

Subject	Workout time in s		CK in U/l at 37°C			
	1	2	Test 1		Test 2	
			before	after	before	after
1	515	476	100	190	73	76
2	331	274	80	175	68	71
3	538	443	447	489	148	166
4	253	219	148	248	122	131
5	321	256	165	111	276	287
6	139	133	289	398	556	566
7	209	160	259	298	434	470
8	510	448	85	137	80	99
9	423	374	122	164	101	121
10	389	346	114	129	101	105
11	371	357	117	148	82	82
12	391	322	380	497	285	337
13	302	298	309	308	220	272
14	179	166	169	185	125	130
15	357	337	80	95	64	75
16	302	283	181	191	147	177
17	437	394	106	195	120	126
18	540	590	86	91	80	88
19	508	545	208	256	171	186
20	235	220	344	281	241	256
21	560	522	192	232	128	167
22	363	315	176	189	170	172
23	440	480	75	94	70	85
24	330	286	510	587	187	205
25	158	140	389	490	203	220
26	186	162	56	237	86	84
27	470	430	118	192	107	170
28	379	302	238	273	172	175
29	528	455	95	108	96	101
30	402	374	141	280	126	159
31	235	228	294	394	208	266
Average:	365	333	195,9	247,2	162,8	181,5
Change in percent:	-8,55%		26,16%		11,45%	
Change in numbers:	-32s		51,3		18,7	
Improvement:	63,55% less CK increase					