

Effects of Bullet Energy Drink on Creatinephosphokinase (CPK) and Lactate Dehydrogenase (LDH) Level of Albino Rat

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Abstract

The effects of bullet energy drink on creatinephosphokinase (CPK) and lactate dehydrogenase (LDH) level of albino rat for 28 days were investigated. Wistar albino rats weighing between 100g and 125g were used for the experiment and were divided into 4 groups of 5 rats in each group. The energy drinks was given to the rats orally by intubation except for the control group. At the end of 7, 14, 21 and 28 days, the mean values for creatinephosphokinase showed statistical increase ($p < 0.05$): $(95.00 \pm 3.61; 99.33 \pm 5.03; 134 \pm 25.74$ and $169.67 \pm 4.51)$ values respectively compared to control $(70.67 \pm 1.53, 72.33 \pm 2.52, 73.00 \pm 1.00$ and $71.33 \pm 1.53)$. There was also a statistically significant increase in the, mean value of lactate dehydrogenase: $(3166.67 \pm 152.75, 3900.00 \pm 100.00, 4545.67 \pm 767.30$ and $2866.33 \pm 762.85)$ values compared to control $(1870.67 \pm 1.53, 1872.33 \pm 1.53, 1871.33 \pm 1.53$ and $1873.67 \pm 3.21)$. High levels of these parameters indicates that the drink may have an effect of the cardiac muscles. Caution should be exercised when consuming energy drink.

Key Words: creatinephospho kinase, lactate dehydrogenase, wistar

Introduction

An energy drink is a drink due to its exceptional composition provides our body with extra energy during times of increased physical strain or stress. They are soft drinks advertised as boosting energy (Nehligetal; 1992).

These drinks usually do not emphasize energy derived from the sugar they contain, (Nehligetal; 1992) rather through a choice of stimulants, vitamins and herbal supplements added by the manufacturers.

These is revealed by the colourful cans and bottles of energy drinks displayed alongside alcoholic and soft drinks, juices and sports drinks in stores, bars, clubs, and even filling stations. The cans are quite inviting and the general belief is that the content will be sweet and fruity as they look. In addition to the colourful packaging, the claim by the manufacturers that they boost energy also entices many into buying it (Kukuljan et al, 1997). They also have names that connote strength, power, speed, sexuality, such as bullet, power horse, monster, red bull, no fear, spark, full throttle, lost venom, rock star, impulse, double shot, rip it, superman, tab energy, and they primarily target the males, movers and shakers on the go, sportsmen, all nighters, clubbers and those whose jobs warrant them staying lengthy hours exerting energy or brain power. Energy drinks are typically attractive to young people. (Wallimann et al; 1992).

Bullet energy drink contains Natural mineral, Dextrose, Sugar, Acidifier (E330), Carbon dioxide, Taurine (0.38%), Glucose-Fructose syrup, Flavorings, Caffeine (0.03%), Acidity regulator (E331), Glucuronolactone (0.01%), Inositol, coloring (E150c), Nicotinamide, Panthothenate, Vitamin B6, Vitamin B12. Caffeine and Taurine for example have health related problem. Caffeine binds to Beta-adrenergic receptors on the surface of heart muscle cells, which leads to an increase in the level of cyclic AMP inside the cells (by blocking the enzyme that degrades cyclic AMP), mimicking the effects of epinephrine (which binds to receptors on the cells that activate cyclic AMP production). Cyclic AMP acts as a "2nd messenger" and activates a large number of protein kinase A (PKA dependent protein kinase). This has the overall effect on increasing the rate of glycolysis and increases the amount of ATP available for muscle contraction and relaxation (Lichtstein, 1945). Research suggests that drinking caffeinated coffee can cause a temporary increase in the stiffening of arterial walls (Howard and Marczinski, 2010).

Taurine plays an important role also in the human retina. It helps to maintain the structure and functionality of photoreceptors. In this respect, taurine is essential in the fetal development of the eye and consequently in case of taurine shortage, defective vision may occur (Mollon, 1986). Taurine has marked effects on the fetal development of the hearing (Van-Den et al; 2008).

Methodology

Experimental Animals

Wistar albino rats weighing (100-125gram) bred in the animal house of Biochemistry Department, University of Port Harcourt were used for the study. They were grouped into two (control and experimental group). The

control rats were only given feed and water while the experimental were given feed, water and bullet energy drinks orally by intubation method. They were fed *ad libitum* for two weeks and 3.6mls of bullet energy drink was given to the experimental rats. At the end of seven days a total of seven animals were sacrificed which comprises of three control rats and four experimental rats. The animals were anaesthetized with chloroform in a closed dessicator. Blood samples were collected through cardiac puncture into a heparinized bottle for analyses. The enzymes were determined using the procedure described by Reitman and Frankel (1957).

Results

The table below showed the effects of bullet energy drink on creatinephospho kinase (CPK) activity in albino rats at intervals of 7 days for 28 days.

Table 1. Effects of bullet energy drink on the activity of creatinephospho kinase (CPK) in albino rats.

TIME (DAYS)	CONTROL GROUP (mMOL/L) Mean \pm S.D	EXPERIMENTAL GROUP (mMOL/L) Mean \pm S.D
7	70.67 \pm 1.53 ^a	95.00 \pm 3.61 ^b
14	72.33 \pm 2.52 ^a	99.33 \pm 5.03 ^b
21	73.00 \pm 1.00 ^a	134.67 \pm 25.74 ^c
28	71.33 \pm 1.53 ^a	169.67 \pm 4.51 ^d

Values are mean \pm standard deviation of triplicate determinations. Mean values in each row with the same superscripts are not statistically significant at P<0.05

Table 2

Effects of bullet energy drink on the activity of lactate dehydrogenase (LDH) in albino rats.

TIME (DAYS)	CONTROL GROUP (IU/L) Mean \pm S.D	EXPERIMENTAL GROUP (IU/L) Mean \pm S.D
7	1870.67 \pm 1.53 ^a	3166.67 \pm 152.75 ^b
14	1872.33 \pm 1.53 ^a	3900.00 \pm 100.00 ^c
21	1871.33 \pm 1.53 ^a	4545.67 \pm 767.30 ^d
28	1873.67 \pm 3.21 ^a	2866.33 \pm 762.85 ^d

Values are mean \pm standard deviation of triplicate determinations.

Mean values in each row with the same superscripts are not statistically significant at P<0.05

All the materials and reagents above were gotten from the department of biochemistry animal house and lively stones medical diagnostic laboratory, Port Harcourt Nigeria.

Discussion

The result of the effects of bullet energy drink on creatinephosphokinase (CPK) and lactate dehydrogenase (LDH) level of albino rat for 28 days investigated showed that there was an increase in the level of creatinephospho kinase when compared with the control for week 7 and the increase is statistically significant. Week 14 shows an increase (99.33 \pm 5.03) in the level of creatinephospho kinase when compared with the control value and this increase is statistically significant. Week 21 shows also an increase (134.67 \pm 25.74) when compared to the control and this increase is statistically significant. Week 28 shows an increase (169.69 \pm 4.51) when compared to the control and it is statistically significant.

There was an increase in the level of lactate dehydrogenase when compared with the control and it is statistically significant. Week 14 shows an increase (2900.00 \pm 100.00) when compared to control and it is statistically significant. Week 21 shows an increase (4545.67 \pm 767.31) when compared to control and it is statistically

significant. Week 28 shows a drastic decrease (2866.67 ± 762.85) compared to the control and this decrease is statistically significant.

High level of creatine phospho kinase and lactatedehydrogenase shows that the heart muscle may have been damaged or inflamed; this could lead to cardiac arrest. Thus, consumption of bullet energy drink should be highly controlled.

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