

# Acute Incremental load Movement Before and After the Red Cell Immune Function and T lymphocytes and Their Subsets Change Research

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**Abstract.** Objective To study the paper acute incremental load movement before and after the red cell immune function and the change of T lymphocytes and their subsets. Selection methods in January 2014-May 2014 in our hospital outpatient treatment of 122 cases of patients as the research object, the elbow vein before extracting its quiet (T1), 1 min after acute incremental load movement (T2), 0.5 h (T3) and 24 h (T4) blood samples from four time, contrast analysis of the movement before and after RBC-C3bRR, RBC-ICR, T lymphocyte subsets CD3+, CD4+, CD8+, CD4+/CD8+ ratio indicators such changes. Results (1) the subjects T2, T3 time wreath of red blood cell C3b receptor rate respectively  $(6.22\pm 0.94)\%$  and  $(6.95\pm 0.79)\%$ , significantly lower than before  $(8.32\pm 1.03)\%$ , compared before and after the movement has difference,  $P < 0.05$ ; Subjects after T2, T3 time wreath of red blood cell immune complex rate respectively  $(16.97\pm 1.37)\%$  and  $(16.53\pm 1.44)\%$ , were significantly higher than those before exercise  $(15.32\pm 1.65)\%$ , compared before and after the movement has difference,  $P < 0.05$ ; But subjects in T4 period, restore the two indexes, and increasing slightly below before exercise, compared to no significant difference between groups,  $P > 0.05$ ; (2) the subjects T3 period T lymphocyte subsets CD3+, CD4+, CD8+ and CD4+/CD8+ ratio continued to decline, and in the T4 period gradually returned to the front of the movement state of quiet, increasing acute T lymphocyte and its subsets before and after load exercise has no obvious changes, compared to no significant difference between groups, do not have statistical significance,  $P > 0.05$ ). Conclusion after acute incremental load movement, the human body in the blood, red blood cell C3b receptor garland rate significantly decreased the wreath of red blood cell immune complex rate is improved significantly, there is lead to the risk of secondary erythrocyte immune function is low, until after 24 hours, red blood cell immunosuppression to fade; After acute incremental load movement, the level of T lymphocyte and CD4+/CD8+ ratio is reduced, until 24 hours after exercise gradually returned to normal state, generally speaking, the change of the industry group of T lymphocytes has no obvious fluctuation.

## Introduction

Development of the times so that the concept of popular exercise regimen, people are more concerned about the importance of exercise and a healthy self-regulation<sup>[1-2]</sup> to enhance the quality of life in the premise. The study for further research and study the changes before and after the acute load sport increased erythrocyte immune function and T lymphocyte subsets, select January 2014-May 2014 in our clinic treated 122 patients for the study, its before and after exercise four times the blood test, comparing before and after exercise in patients with blood RBC-C3bRR, RBC-ICR, T lymphocyte subsets CD3+, CD4+, CD8+, CD4+/CD8+ ratio and other indicators of changes, are reported below.

## Materials and Methods

General Information Select January 2014-May 2014 in our clinic treated 122 patients for the study, patients involved in this study were not immune or endocrine system diseases, no mental disorders, motor dysfunction or expression disorder, and 72 hours before the study was not involved in any strenuous exercise, diet, rest and ordinary is no different, is voluntary to participate in this study, of which I am informed consent. Of which 83 males and 39 females; aged 16-33 years, mean (22.7±3.1) years; body weight (62.4±5.2) kg; height (173.2±3.4) cm.

Exercise Methods ① to ensure that the subject is a quiet state, after the beginning of the exercise bike acute Incremental Exercise; ②power of 1 minute bicycle initial power 25 watts; ③ maintain formal experiment 80 watts, 60 rpm per minute, until Exhaustive subject.

Research Methods① Blood samples were taken: at the time of the subject quiet, 1min, 0.5h and 24h four hours before collecting venous blood 4ml after acute incremental load exercise;②by Wright's staining method to measure the RBC-C3bRR (RBC C3b receptor rosette rate) and RBC-ICR (erythrocyte immune complex rosette rate indicators change;③using conventional direct immunofluorescence<sup>[3]</sup>, measurement of T lymphocyte subsets CD3+, CD4+, CD8+ expression.

Exhaustive Criteria ①HR≥180times/min;②respiratory quotient>1.2; ③BLA≥9mmol / L; ④appear maximal oxygen uptake platform<sup>[2]</sup>; ⑤ subject akinesia; meet three to five judges said body motion exhaustive state .

Statistical methods Take SPSS12.0 statistical software for data processing described above, ( $\bar{x}\pm s$ ), said take t test; contrast to P<0.05 was considered statistically significant.

## Results

### RBC-C3bRR and RBC-ICR index change before and after acute Incremental Exercise.

RBC-C3bRR blood of a subject and RBC-ICR ratio in T2, T3 and T1 time period compared with a significant difference, P<0.05; but subjects in the period T4, the two indicators are gradually restored and slightly lower before exercise, contrast between the two groups was no significant difference, P>0.05, detailed in table 1 below.

Table1. RBC-C3bRR and RBC-ICR indicators before and after an acute incremental load movement ( $\bar{x}\pm s, \%$ )

	RBC-C3bRR	RBC-ICR
Before exercise	8.32±1.03	15.32±1.65
1min after exercise	6.22±0.94	16.97±1.37
0.5h after exercise	6.95±0.79	16.53±1.44
24h after exercise	8.24±1.02	15.12±1.38
t <sub>1</sub> , P <sub>1</sub>	16.6339, <0.05	8.4979, <0.05
t <sub>2</sub> , P <sub>2</sub>	11.6573, <0.05	6.1026, <0.05
t <sub>3</sub> , P <sub>3</sub>	0.6096, >0.05	1.0270, >0.05

**Changes of T lymphocyte subsets before and after acute Incremental Exercise.** Subjects in the T<sub>3</sub> period T lymphocyte subsets CD3+, CD4+, CD8+ ratio and CD4+/CD8+ ratio were continued to decline, and in the period T<sub>4</sub> gradually returned to the quiet state before exercise, before and after the acute Incremental Exercise T lymphocytes and its subgroups no significant changes, compared to no significant difference between the groups, not statistically significant, P>0.05, detailed in table 2 below.

Table 2 before and after acute Incremental Exercise T lymphocyte subsets and their circumstances ( $\bar{x}\pm s$ ) (n=122)

	CD3+ (%)	CD4+ (%)	CD8+ (%)	CD4+ / CD8+
Before exercise	76.32±8.77	43.26±9.34	38.60±9.58	1.33±0.36
1min after exercise	74.36±8.01	41.21±9.77	37.98±7.54	1.30±0.32
0.5h after exercise	72.96±16.78	40.81±10.73	36.58±6.29	1.26±0.27
24h after exercise	77.27±8.03	41.99±8.49	38.95±9.78	1.22±0.40
t <sub>1</sub> , P <sub>1</sub>	1.8227,>0.05	1.6752,>0.05	0.5617,>0.05	0.6880,>0.05
t <sub>2</sub> , P <sub>2</sub>	1.9601,>0.05	1.9023,>0.05	1.9468,>0.05	1.7182,>0.05
t <sub>3</sub> , P <sub>3</sub>	0.8825,>0.05	1.1114,>0.05	0.2824,>0.05	0.8209,>0.05

Note, in Table 1, t<sub>1</sub>, P<sub>1</sub> is compared with the T1 T2; t<sub>2</sub>, P<sub>2</sub> is compared with the T1 T3; t<sub>3</sub>, P<sub>3</sub> is compared with the T1 T4.

## Discussion

Research shows that <sup>[4-5]</sup>, exercise can cause the body's immune function changes <sup>[6]</sup>, acute or Exhaustive Incremental Exercise sports, athletes immune function is decreased <sup>[5]</sup>, and increased susceptibility to adverse health of their lives. The author of depth before and after acute incremental load exercise erythrocyte immune function and T lymphocyte subsets, select 122 cases of subjects participating in this study, and blood in T1, T2, T3, T4 four hours testing, comparison RBC-C3bRR, RBC-ICR, T lymphocyte subsets CD3+, CD4+, CD8+, CD4+/ CD8+ ratio and other changes before and after their sports, discover RBC-C3bRR and RBC-ICR proportion of subjects blood in T2, T3 period when compared with the T1 period, a significant difference, and are gradually returning to normal ratio in the period T4, it indicates that the subject gradually decreases in erythrocyte immune function after acute incremental load exercise, until after the motion has been in a state of suppressed within 24 hours <sup>[7-8]</sup>. In addition, it also found that subjects in the T3 period T lymphocyte subsets CD3+, CD4+, CD8+ ratio and CD4+/CD8+ ratio were continued to decline, and in the period T4 gradually returned to the quiet state before exercise, before and after acute incremental exercise T lymphocyte subsets and no significant changes, compared to no significant difference between the groups, indicating that T lymphocyte levels and no significant fluctuations after acute incremental load exercise, the immune reaction is not sensitive to red blood cells <sup>[9-10]</sup>.

In summary, after acute incremental load exercise, the human red blood cell C3b receptor rosette rate was significantly reduced and erythrocyte immune complex rosette rate is significantly improved, resulting in the presence of red cell immune function secondary risk until 24 hours after the motion erythrocyte immune suppression gradually subsided; after acute incremental load exercise, T lymphocyte levels and CD4+/CD8+ ratio decreased until 24 hours after exercise, before gradually returning to normal state, in general terms, T lymphocytes no changes in their industry group significant fluctuations.

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