



RESPONSE OF SOME BLOOD IMMUNE SYSTEM VARIABLES AFTER TWO DIFFERENT AEROBIC EFFORTS FOR LONG DISTANCES RUNNERS

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<p>Kata kunci: Sistem kekebalan darah, aktivitas aerobik, pelari jarak jauh.</p>	<p>ABSTRAK</p> <p>Tujuan studi ini adalah untuk mengetahui pentingnya perbedaan nilai tes pra-latihan dua latihan aerobik Sharki dan Bruce terhadap beberapa variabel sistem kekebalan darah pada pelari jarak jauh, serta mengetahui pentingnya perbedaan nilai tes pasca-latihan dua latihan aerobik Sharki dan Bruce terhadap beberapa variabel sistem kekebalan darah pada pelari jarak jauh. Peneliti berhipotesis bahwa tidak ditemukan perbedaan yang secara moral signifikan pada nilai tes pra-pasca dua latihan aerobik Sharki dan Bruce terhadap beberapa variabel sistem kekebalan darah pada pelari jarak jauh. Peneliti menggunakan metode deskriptif karena kesesuaiannya. Populasi penelitian terdiri dari 10 atlet lari jarak menengah dan jauh dari Provinsi Nineveh, sedangkan sampel terdiri dari 6 atlet lari jarak jauh yang dipilih secara acak, mewakili 60% populasi. Metode statistik yang digunakan meliputi uji t untuk sampel terkait, simpangan baku, rata-rata, dan faktor varians. Peneliti menemukan bahwa dua latihan aerobik tersebut menyebabkan perubahan signifikan pada variabel WBC, MON, GRA, dan Globulin, namun tidak menyebabkan perubahan signifikan pada variabel LYM. Rata-rata latihan aerobik Sharki lebih tinggi daripada Bruce. Disarankan untuk melakukan pemeriksaan berkala bagi atlet di pusat-pusat olahraga khusus guna mengetahui kondisi kesehatan atlet secara umum dan sistem kekebalan tubuh secara khusus, serta melakukan studi yang sama pada atlet wanita. Lakukan studi perbandingan antara atlet pria dan wanita terkait variabel yang sama dan latihan yang sama.</p>
<p><i>Keywords:</i> <i>blood immune system, aerobic efforts, long distances runners.</i></p>	<p>ABSTRACT</p> <p><i>Aim of current study is to know importance of differences in values of pre-tests of two aerobic exercises Sharki and Bruce on some blood immune system variables for long distances runners, know importance of differences in values of post-tests of two aerobic exercises Sharki and Bruce on some blood immune system variables for long distances runners. Researcher hypothesized no morally significant differences are found in values of pre-post tests of two aerobic exercises Sharki and Bruce on some blood immune system variables</i></p>

	<p><i>for long distances runners. Researcher used descriptive method due to its appropriateness. Society was 10 advanced players of Nineveh governorate for medium and long distances the sample were 6 long distances players representing 60% chosen randomly chosen . the following statistical means were used t-test for related samples, standard deviation, means, variance factor. Researcher founded two aerobic exercises made moral change in WBC , MON , GRA Glubiolin, two aerobic exercises didn't make moral change in LYM variables, means of aerobic exercise Sharki was higher than that of Bruce. Recommended necessity of periodical check for athletes in specialized athletic centers to know health status of athletes in general and immune system in particular to study same variables on female athletes. Make a comparative study between male and female athletes regarding same variables and same and exercises.</i></p>		
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INTRODUCTION

Developments in athletic training physiology , its inclusiveness of athletic activity and explanation for physiological adaptations and responses are very important in development of athletic achievement. It is known that intense and long exercises have changes in physiological features of blood, and vital chemical components. Athletes practicing long athletic activity should keep this fact in mind. intense physical exercises can cause many changes and responses in body physiology Telegloe et al ,2002 , p11-12.

Study of functional responses and adaptations of different body organs took a lot of attention through the years because an athlete can reach his peak performance via synchronized mechanism of integrated processes of different body organs however some organs are of no less importance that went low from radar of athletic researchers studying responses of immune system variables is an important and vital determiner of athletic achievement that needs to study, shed light on it as well as factors. malfunctions of variables of this device may affect negatively on body defense means this may cause many infectious diseases that eventually affect athletic performance. thus many studies around the world took place focused on different responses and adaptations in immune system variables resulting from different intense and kinds of training. Smith and Pyne 1997 stated that exercise intense and level of fitness are main affecting elements on responses of immune system Smith & Pyne 1997,96-117.

Regarding intense of exercise Sharp and parry assisted that light to mild exercise affects positively on immune system unlike long and intense ones Sharp & Parry, 1992,33-37 This coincides with what Pederson et al. 2000 found Pedrson et al ,2000,1055, Venkatrman et al. 1997 found that intense training for short period affected differently on immune system (Venkatrman et al ,1997, p333-344) . A study of (Nieman ,2002) on intense and volume of exercise and upper respiratory canal infection stated that intense long exercise increases upper respiratory system infection (URTI) via awakening some immune system variables specially IgA protein in mucus Nieman ,2002, p1-4. because developing a (URTI) relates with level of immune protein IgA in saliva Gleeson et al 1997,p67. opposing view Osrerback & Qvarnberg 1987,p944) (Schouten et al 1988,p451) said that mild intense training has no effect on having (URTI). Reviewing literatures, researcher decided to study these variables within two different aerobic exercises

Problem of research

Through literature review, researcher found many tests to measure variables under discussion, thus questions were: does all these tests deliver the same ? will these tests have same effects throughout test despite difference in speed , steep and period of each stage to answer, researcher adopted tests with treadmill because this device involves participation of muscles thus there will be a change in blood variables. researcher chose two tests Sharkey and Bruce, latter is slow graduation test stage lasts 3 minutes while former is fast graduation stage lasts 1 minute.

Aims to know importance of importance of differences in values before aerobic tests Sharkey & Bruce on some variables of immune system for long distances runners know importance of differences in values after aerobic tests Sharkey & Bruce on some variables of immune system for long distances runners.

hypotheses no morally significant differences in values before aerobic tests (Sharkey & Bruce) on some variables of immune system for long distances runners, no morally significant differences in values after aerobic tests (Sharkey & Bruce) on some variables of immune system for long distances runners.

METHOD

Descriptive due to its appropriateness. Society was team of Nineveh governorate for medium and long distances advanced runners (10) players. sample was (6) long distances runners representing (60%) chosen randomly. researcher got written signatures of sample about nature and processes of research (see appendix). variance factor showed an acceptable harmony among sample. table (1) shows some personal information attained by survey (appendix)

Table 1. Statistical Features Of Some Characteristics Of Sample

Variables	Height	Weight	Age	Training age	Recess pulse
Means	175,4	67,34	22	2,6	68,6
Standard deviation	3,13	5,51	1,41	0,54	5,45
Variance factor	1,78	8,18	6,42	21,06	7,95

Steps to prepare blood samples

Arterial blood samples collected by a syringe of (5 cc). Blood samples were kept and reached lab in a box container

Tests and scales of harmony of sample

Body measures: height (cm) and weight (kg) of body; both were attained using detector device . turn device on , make it read zero, players stands bare feet while co-worker moves metal pointer to touch his head and we get his height in cm. weight is registered after we get a stable digit in kilograms to nearest 200 grams.

Physical tests

Researcher used tests measuring aerobic effort one depends on speed and the other on steepness to increase intense of test using treadmill. Sharkey test: Aims to reach ultimate (VO₂ max) for researcher on treadmill , an effort depends on graduate steepness , (VO₂) is measured in lab conditions. Tools: treadmill with speed and steepness indicator. Prepare warm up for 5 minutes on treadmill to jog or walk in 6 km/h and steep of 4% then recess for 5 minutes. Description: test

begins by running and increase steep of device one degree at a time to reach steep 10% at 8th minute. effort begins at speed of 6,9 km/h until 8th minute where researcher reaches his willingness exhaustion . least time to do this effort in lab is 8 minutes.

Table 2. Steepness And Speed Per Minute For Sharkey Test

Minutes of effort	Steepness %	Speed (km\h)
1	4	9,6
2	5	9,6
3	6	9,6
4	7	9,6
5	8	9,6
6	9	9,6
7	10	9,6
8	10	11,2
9	10	12,8
10	10	12,8
11	10	12,8
12	10	12,8
13	10	12,8
14	10	12,8

Bruce test: Aims to reach ultimate (VO₂ max) for researcher on treadmill, an effort depends on graduate steepness , (VO₂) is measured in lab conditions. Tools: treadmill with speed and steepness indicator. Prepare warm up for 5 minutes on treadmill to jog or walk in 6 km/h and steep of 4% then recess for 5 minutes. Description: this test is of 7 sages, each stage with a speed and steepness , every stage lasts 3 minutes as shown in table 3.

Table 3. Stages Of Bruce Test

Stages	Total time (m)	Steepness %	Speed (km/h)
1 st	1-3	10	2,74
2 nd	3-6	12	4,02
3 rd	6-9	14	5,47
4 th	9-12	16	6,76
5 th	12-15	18	8,05
6 th	15-18	20	8,8
7 th	18-21	22	9,7

Pilot experiment

Two sample members passed pioneer experiment on 22/2/2023 in physiology lab at college of basic education / university of Mosul to know suitability of test regarding performance, lab issues and testing members' abilities. tests suited sample level so test ran successfully as well as : know right time and range of tests, know what problems of execution and solving them, train co-workers on steps of test, know suitability of lab regarding heat and humidity, know the estimated amount of each test.

Main experiment

Measures at leisure time sample members enter lab, change their clothes sit for 15 minutes before taking pre-scales take blood sample from artery after sitting comfortably in a (5 cc) syringe by a specialized biologist. Sample warmed up by running on treadmill from 4-10km/h for 10 minutes, recess for 5 minutes after warming up on treadmill. Researcher did experiment on two stages 1st was normal temperature (22-24) and (0%) humidity. to realize goals, researcher tested sample on Sunday 7/2/2023 for Sharkey test and Sunday 13/2/2023 for Bruce test at 9:00 a.m. tests included measures at leisure time and post exercise to realize goals, researcher made tests on samples individually , taking these points into consideration. To make sure that all sample members have same time to warm up and exercise, warm up was arranged so that time between one player and another (5-10) minutes there were 2 treadmill, one for warming up and second for exercise. Both tests taken under same conditions, with same team for all functional measurements, arterial blood sample was taken from player after sitting comfortably from capital fossa by specialized biologist with an amount of (5 cc) after completing exercise directly testers did tests as mentioned by book.

Post-effort measures

An amount of (5 cc) artery blood sample was taken from testers.

Statistical treatments

The following statistical means were used means, standard deviation, t-test for related samples, variance factor Al-Tikriti and Al-Obaidi 1999,161, data treated statistically using (SPSS 17) and statistical figures were treated using (EXCEL) program.

RESULTS AND DISCUSSION

Outcome of means, standard deviations and t-value, possibility value and morality for sample members

Table 4. Means, Standard Deviations, Values Of (T), Possibility And Morality For Sample Members After Two Aerobic Efforts

Function variables	Kind of effort	Means	Standard deviation	t-value	Possibility	Sig.
WBC	Bruce	6,8	0,40	4,0	0,01	Sig.
WBC	Sharkey	8,0	0,52	4,0	0,01	Sig.
LYM	Bruce	2,5	0,18	0,69	0,51	Insig.
LYM	Sharkey	2,6	0,11	0,69	0,51	Insig.
MON	Bruce	0,46	0,03	5,47	0,003	Sig.
MON	Sharkey	0,66	0,04	5,47	0,003	Sig.
GRA	Bruce	3,8	0,31	5,43	0,003	Sig.
GRA	Sharkey	5,2	0,44	5,43	0,003	Sig.

False margin > 0,05

Table 4 shows that there are moral differences after two aerobic exercises in (WBC, MON and GRA). No morally significant differences after two aerobic exercises in (LYM). researcher attributes these results to two aerobic efforts . This coincides with what Peters Futre , 1997 stated.

results of changes in immune system depends heavily on period, intensity of exercise and physical fitness (Peters –Futre,1997,p32-52).

Researchers attribute results of means in table 3 to continuity of effort motivate body to produce more white blood cells with defensive features of immune system , cellular defensive variables, LYM, MON and antibodies that protects body through phagocytosis and via specialized immune responses. LYM kills viruses and responsible for cellular immune responses. MON devour microbes and clean damaged cells and motivate other blood cells to defend body . GRA is found in body liquids but heavily located in blood serum, these protiens work as antibodies working with antibiotics (Al-Makawi, 1998,53). Morthyl and Zimmerman (1998) found that running long distances causes increasing (Granulocytosis) compared to short tem exercises (Morthyl and Zimmerman, 1998, p1024) AlNoaimi (2004) thinks that moral increase in total number of WBC in tests at low and moderate itense attributed to connections between nervous, lymph and immune systems (Al-Noaimi 2004, p 68).

Joseph and Roy (1995) state that high tense lengthening exercise accompanied by disturbance in numbers of WBC in blood circulation . This number increases by (50-100%) directly after exercise as well as Lymphocytes and Neutrophils and Monocytes . Increase is also big after long lengthen exercises like marathons . increase reaches (200-300%) within 30 minutes of healing after exercise, Lymphocyte drops to 30-50% of pre-exercise level and stays low for 3-6 hours. However they multiply in first minutes of training as well as (T-cytotoxic) in blood circulation to be (50-100%) after training while (T-helpers) and B cells remain unaffected and all these changes in (30 minutes) (Joseph & Roy , 1995, p 510).

Abdulfattah (2002) cited in Mala Alo 2011 that moderate and long activities increases catecholamine. however these rates differ from one person to another. However, training increases WBC Cortisone launched during long endurance exercises lead to increase number of WBC after training for 2 hours (Mala Alo , 2011, 68). Maughan et al, 2004 cited in (Al-Hazaa, 2009) stated that physical effort increases WBC in collaboration with intensity physical effort. these cells return to their original numbers after few hours or days (Al-Hazaa,2009,p 528).

This study coincides with what (Nelson & Pederson 2007, p375-379), (Keast et al , 1995, p15-18)) moral increase in WBC in two aerobic exercises as well as moderate effort is due to connection between nervous , glands and immune systems surgically speaking (Al-Noaimi, 2004) (Madden & Fatten, 1995) (Schorr and Amason, 1999). Ripka and Ripka 1995 said that sympatico fibers supply sympatico organs , presence of adrenoceptors on leukocytes in brain. (Ader et al 1991) and (Berczi, 1986) focus on links between brain and immune system . these last two studies focused on this point any changes in central nervous system reflected on immune responses and vice versa (Al-Noaimi , 2004, pp68-69). Given these literatures we can attribute increase in numbers of WBC to many mechanics from nervous , gland way (Ottaway and Husband, 1994).

CONCLUSION

Two aerobic efforts made a change in WBC , MON , GRA. Both efforts did not have moral difference on LYM. Mathematical means of Shrakey exercise was higher than that of Bruce. Necessity to have periodical checkups on athletes in physiology labs to check their health status in general and immunity system in particular. Make a study to study same variables on female athletes. Make a comparative study between male and female athletes regarding same variables and same and exercises. Although the two aerobic exercises caused significant changes in the WBC, MON, GRA, and Globulin variables, they did not cause significant changes in the LYM variable. This certainly warrants special attention and can be seen from external and internal factors that influence it. Recommendations include conducting regular check-ups for athletes at specialized sports centers to assess their overall health and immune system function, as well as

conducting the same study on female athletes. A comparative study should be conducted between male and female athletes regarding the same variables and the same exercises.

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