

Faculty Of Pharmacy, Nursing and Health Professions

Nutrition and Diet

Anatomy and Physiology lab

Report #1: Measurement of basic physiological parameters

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Objective

1. To practice the measurement of heart rate, respiratory rate, blood pressure and temperature.
2. Learn methods of calculation and presentation of results.
3. Establish the normal physiological values of student.

Introduction

 The basic phycological parameters are (temperature, pulse rate, blood pressure, respiratory rate), vital signs give an indication of the general health of the individual, and they also indicate the presence of possible diseases, as they vary according to age, gender, weight of the person and general health, the aim of the experiment is to note a difference of basic physiological parameters in the presence of physical activity / exercise, which is one of the important factors for the difference and change of vital signs.

Temperature: ranges in healthy adults between 36.6 \_ 37.2, changes according to physical activity, gender, eating specific types of food or drink, and the health status of the individual.

Pulse rate: The heart rate per minute is considered one of the important vital signs, it ranges in healthy people between 60-100 beats per minute, it changes according to physical activity, psychological emotions, and changes in health status. Females aged 12 years and over have pulse rates of more than males of the same age.

Blood pressure: It measures the force of blood pressure on the walls of the arteries, and healthy people have at rest 120/80, which represents: Systolic pressure: This is the pressure of the blood when the heart contracts Diastolic pressure: is the blood pressure when the heart rests between beats There are several factors that affect blood pressure, such as: (exercise, caffeine and alcohol intake, a full bladder or stomach, stress, and some medications).

Respiration rate: It represents the number of breaths taken per minute, which in healthy people represents from 12-16 breaths per minute. There are some cases in which the respiratory rate increases, including: (asthma, infection, fever, and dehydration) As for cases of decreased breathing rate: (sleep apnea syndrome, some medications, drug or alcohol abuse. (1)

Procedure

1. Measure blood pressure, temperature, respiratory rate and heart rate before exercise (in the normal state).
2. Auscultatory blood pressure measurement, pulse rate measurement, temperature measurement and respiratory rate during the following cases:

* After exercise directly
* After 10 min of exercise
* After 20 min of exercise

Results

|  |  |  |  |
| --- | --- | --- | --- |
| students | Age | Height | Weight |
| 1 | 19 | 162 | 62 |
| 2 | 19 | 164 | 62 |
| 3 | 19 | 162 | 69 |
| 4 | 19 | 165 | 56 |
| 5 | 19 | 156 | 53 |

Table (1): Student’s information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| students | Blood pressure | Heart rate | Respiratory rate | Temperature |
| 1 | 98\66 | 96 | 18 | 36.7 |
| 2 | 104\70 | 83 | 17 | 35.1 |
| 3 | 121\72 | 92 | 24 | 36.9 |
| 4 | 103\62 | 63 | 22 | 36.9 |
| 5 | 108\72 | 95 | 28 | 36.4 |

Table (2): Normal results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| students | Blood pressure | Heart rate | Respiratory rate | Temperature |
| 1 | 105\63 | 114 | 35 | 37.1 |
| 2 | 145\91 | 110 | 33 | 36.4 |
| 3 | 153\81 | 152 | 37 | 37.4 |
| 4 | 152\91 | 131 | 37 | 36.9 |
| 5 | 142\78 | 144 | 45 | 37 |

Table (3): After exercise directly

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| students | Blood pressure | Heart rate | Respiratory rate | Temperature |
| 1 | 91\96 | 103 | 21 | 36.8 |
| 2 | 110\82 | 104 | 23 | 36.3 |
| 3 | 112\80 | 108 | 21 | 37.3 |
| 4 | 113\73 | 95 | 28 | 36.4 |
| 5 | 102\75 | 116 | 46 | 36.8 |

Table (4): After 10 min of exercise

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| students | Blood pressure | Heart rate | Respiratory rate | Temperature |
| 1 | 97\65 | 94 | 19 | 37.1 |
| 2 | 112\79 | 106 | 22 | 35.3 |
| 3 | 123\83 | 113 | 30 | 36.9 |
| 4 | 106\70 | 93 | 23 | 37.3 |
| 5 | 94\66 | 101 | 21 | 36.7 |

Table (5): After 20 min of exercise

Discussion

Respiration rate reflects the activity of the respiratory system, the rate and depth of breathing in the resting position is within the normal position between 17-28 according to the experiment that was done, and the results are close to the normal range during complete rest between 14-18, due to the complete lack of comfort during the examination.

  Immediately after performing the exercise, the respiratory rate increased dramatically to 33-37 breaths per minute in order to deliver a greater amount of oxygen and sugars to the muscles to burn energy through the metabolism process, and other processes. According to the oxygen equation:

+ sugar......> energy + water + carbon dioxide.

 The respiratory rate after exercise remains relatively high to between 21-28 because the muscles still need oxygen, so the body maintains more steady and rapid breathing than the normal position.

After 20 minutes of hard physical exertion, it remains relatively high, but we notice its gradual return to normal. (2)

Blood Presser Blood pressure is the pressure of blood pushing against the walls of your arteries. Arteries carry blood from your heart to other parts of your body. Blood pressure is measured using two numbers: The first number called *systolic* blood pressure, measures the pressure in your arteries when your heart beats. The second number called *diastolic* blood pressure, measures the pressure in your arteries when your heart rests between beats.

Normal blood pressure is 120/80 mmHg. As the results of the experiment showed, the blood pressure of all members was (98/59-117/69) in the state of rest and no physical exertion, and these values ​​are considered normal. But when we exercised for 10 minutes, the blood pressure increased and the range became (118/80-158/90), and these values ​​are also considered normal and a normal response to the body, as it became in a state of increased need for blood and its nutrients. When exercising, the heart rate increases and contracts more forcefully, and when exercise reaches its peak, the blood pressure level has reached its highest levels and drops to the normal level after the end of those efforts. Hhypertension, is blood pressure that is higher than normal (140/90 or more than). A person's blood pressure changes during the day based on their activity, and measuring blood pressure consistently above the normal range may lead to a diagnosis of high blood pressure (hypertension).The higher your blood pressure levels, the more risk you have for other health problems, such as heart disease, heart attack, and stroke. Hypotension occurs when measuring pressure steadily less than normal (90/60mmHg or less than).

The Temperature rises after exercise because during exercise we need high energy of movement as nutrients are broken down from the muscles to provide the body with the necessary energy, so the blood pressure rises to provide more oxygen to the working tissues, increasing the body temperature and the amount of work the body must do to maintain a constant temperature

So, the body regulates its temperature by controlling the excretion of sweat.

After10 min: the temperature it decreased because the body took a break from exercise, so the body temperature was regulated so that it returned to almost normal.

After20min: The temperature was lower than the previous stage by a few tenths because the body took a very sufficient stage of rest in which the temperature, heart rate and body pressure decreased, the body temperature was almost completely regulated, at this stage we can judge that the temperature has returned to its normal degree. (3)

Heart rate is the speed of the heartbeat measured by the number of contractions (beats) of the heart per minute (bpm). Heart rate is modulated by different factors, for instance: physical fitness, stress, drugs, and more factors. The normal heart rate is between 60-100 bpm. Three conditions happen during the heart pulsing and it differs from each other, tachycardia, bradycardia and arrhythmia.

Tachycardia is when the HR is above 100 bpm, the number can vary between children and adults, Physiological conditions where tachycardia occurs: Pregnancy, Emotional conditions such as anxiety or stress, Exercise, and exercise raises the heart rate to supply the body with enough oxygen and muscle strengthening, then after 10 minutes the heart rate decreases and then returns to normal when we rest for 20 minutes

There are also many Pathological conditions where tachycardia occurs.

Bradycardia is when the HR is below 60, trained athletes tend to have slow resting heart rates, and resting bradycardia in athletes should not be considered abnormal if the individual has no symptoms associated with it.

Arrhythmia is abnormalities of the heart rate and rhythm it is divided into two types: fast and slow heart rates. Some cause few or minimal symptoms. Others produce more serious symptoms.

Chart

A) Heart rate

|  |  |
| --- | --- |
| H R | student |
| 96 | 1 |
| 83 | 2 |
| 92 | 3 |
| 36 | 4 |
| 95 | 5 |
| 80.4 | AVR |

Table.1:data of normal H.R

|  |  |
| --- | --- |
| H R | student |
| 114 | 1 |
| 110 | 2 |
| 152 | 3 |
| 131 | 4 |
| 144 | 5 |
| 130.2 | AVR |

Table.2: data of a EXERSICE of H.R

|  |  |
| --- | --- |
| H R | student |
| 103 | 1 |
| 104 | 2 |
| 108 | 3 |
| 95 | 4 |
| 116 | 5 |
| 105.2 | AVR |

Table.3: data of H.R after 10m

|  |  |
| --- | --- |
| H R | student |
| 94 | 1 |
| 106 | 2 |
| 113 | 3 |
| 93 | 4 |
| 101 | 5 |
| 101.4 | AVR |

Table.4: data of H.R. after 20m

|  |  |
| --- | --- |
| average | tables |
| 80.4 | Normal |
| 130.2 | exercise |
| 105.2 | after 10 m |
| 101.4 | after 20 m |

Table.5: averages

Chart of table

In this chart, it shows the normal heart rate, which ranges between 60 to 100 beats per minute, to show after exercise a noticeable increase in heart rate, let's start gradually with minus to return to normal. During exercise, your body may need three or four times your normal cardiac output, because your muscles need more oxygen when you exert yourself. During exercise, your heart typically beats faster so that more blood gets out to your body. Your heart can also increase its stroke volume by pumping more forcefully or increasing the amount of blood that fills the left ventricle before it pumps. Generally speaking, your heart beats both faster and stronger to increase cardiac output during exercise. (4)

B) Blood Presser

|  |  |  |
| --- | --- | --- |
| student | Systolic pressure | Diastolic pressure |
| 1 | 98 | 66 |
| 2 | 104 | 70 |
| 3 | 121 | 72 |
| 4 | 103 | 62 |
| 5 | 108 | 72 |
| AVR | 106.8 | 68.4 |

Table.1 data of normal B.b

|  |  |  |
| --- | --- | --- |
| student | systolic pressure | Diastolic pressure |
| 1 | 105 | 63 |
| 2 | 145 | 91 |
| 3 | 153 | 81 |
| 4 | 152 | 91 |
| 5 | 142 | 78 |
| AVR | 139.4 | 80.8 |

Table.2 data B.b of After exercise directly

|  |  |  |
| --- | --- | --- |
| student | systolic pressure | Diastolic pressure |
| 1 | 91 | 96 |
| 2 | 110 | 82 |
| 3 | 112 | 80 |
| 4 | 113 | 73 |
| 5 | 102 | 75 |
| AVR | 105.6 | 81.2 |

Table.3 data B.b of After 10m

|  |  |  |
| --- | --- | --- |
| student | Sytolic pressure | Diastolic pressure |
| 1 | 97 | 65 |
| 2 | 112 | 79 |
| 3 | 123 | 83 |
| 4 | 106 | 70 |
| 5 | 94 | 66 |
| AVR | 106.4 | 72.6 |

Table.4 dataB.b of After 20 m Group4

|  |  |  |
| --- | --- | --- |
| Tables | Sytolic pressure | Diastolic pressure |
| NORMAL | 106.8 | 68.4 |
| AFTER EXERSICE | 139.4 | 80.8 |
| AFRE 10 M | 105.6 | 81.2 |
| AFTER 20 M | 106.4 | 72.6 |

Table.5 averege

Blood pressure and heart rate can vary with many activities, before studying the effects of these activities we have to measure normal heart rate and blood pressure. In the first graph, it was found that the average results for the normal state ranged between 60-100, but after sports we noticed that the systolic pressure increased significantly, while the diastolic increased slightly, then the measurements were discussed gradually after 10 minutes and 20 minutes after training to return to normal blood pressure

Aerobic activities such as swimming, cycling, and running put additional demands on your cardiovascular system. Your muscles need more oxygen than they do when you're at rest, you have to breathe more quickly. heart starts to pump harder and faster to circulate blood to deliver oxygen to your muscles. As a result, systolic blood pressure rises. It's normal for systolic blood pressure to rise to between 160- and 220-mm Hg during exercise. Beyond 220 mm Hg.

Conclusion

It was a very successful and interesting experiment as a group work, as most of the scales for the class and our group were also considered nearly in the normal range. There was a difference between temperature &BP & HR& respiratory rate at normal condition and after physical activities.

References

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