

THE STUDY OF THE HEART RATE IN ATHLETES ENGAGED IN UNDERWATER SPORTS, DEPENDING ON THE SPECIALIZATION

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ABSTRACT:

Goal. To study the heart rate (HR) indicators in divers of different specialization in 2000, 2010, and 2020. Materials and methods. The study involved three generations of submariners (divided into groups): group A-2000, group B-2010, and group B-2020. Each group consisted of 10 boys and 10 women aged 17 to 25 years. Results. Male and female submariners of group B are characterized by higher rates of increase in resting heart rate (HR), compared to athletes of group A and B. Conclusion. The cardiovascular system is sensitive to various influences, including strenuous physical activity, but the compensatory capabilities of the heart are not unlimited and if this is not taken into account, then you can get overexertion. In our case, it was found that the heart rate, regardless of specialization, reflects the functional level of the state of the cardiovascular system in accordance with different somatotypes.

Keywords. underwater sports, heart rate, pulse, training process, heart rate monitoring.

1. Introduction. The development of underwater sports is very rapid. Every year, athletes set new national, European and world records. To maintain the high positions won by the national team of the country at the world level, a new approach to the training process is needed.

The results of the study of the morphofunctional characteristics of submariners allow coaches to determine the specialization for the athlete, which in the future, at the stage of improving the highest sports skills, will allow achieving the highest sports results.

Sports training helps to increase the functional capabilities of the body, and they largely ensure the achievement of high sports results. With a competent construction of the training process, taking into account individual anthropometric indicators, the reserve capabilities of the body increase, increasing its biological stability and reliability of the system.

Goal. To study the indicators of heart rate (HR) in submariners of different specialization in 2000, 2010, 2020.

2. Materials and methods. The study involved three generations of submariners (divided into groups): group A-2000, group B-2010, and group B-2020. Each group consisted of 10 boys and 10 women aged 17 to 25 years. Athletes were divided into sprinters, stayers, and submariners.

With a wide variety of methods for studying cardiac activity, palpation is characterized by speed and simplicity, since no long-term special preparation is required before the procedure. The palpatory method allows you to estimate the heart rate by the pulse rate, when probing the radial artery in the wrist area. The subject felt the area of the radial artery on his arm with three fingers, when he felt a pulse, he began to count the number of beats for 60 seconds. The measurements were taken in the morning.

3. Results. An important indicator in scuba diving, in addition to the functional state of the respiratory apparatus, is the indicators of the cardiovascular system, which depend both on the biological characteristics of the body and on the distances at which the athlete specializes. Regardless of the specialization, a significant load in scuba diving falls on the circulatory system. Since the heart rate reacts to emotional and physical stress, to the internal and external environment of the body, we studied the heart rate and blood pressure at rest. The resting heart rate (among men) is shown in Figure 1.

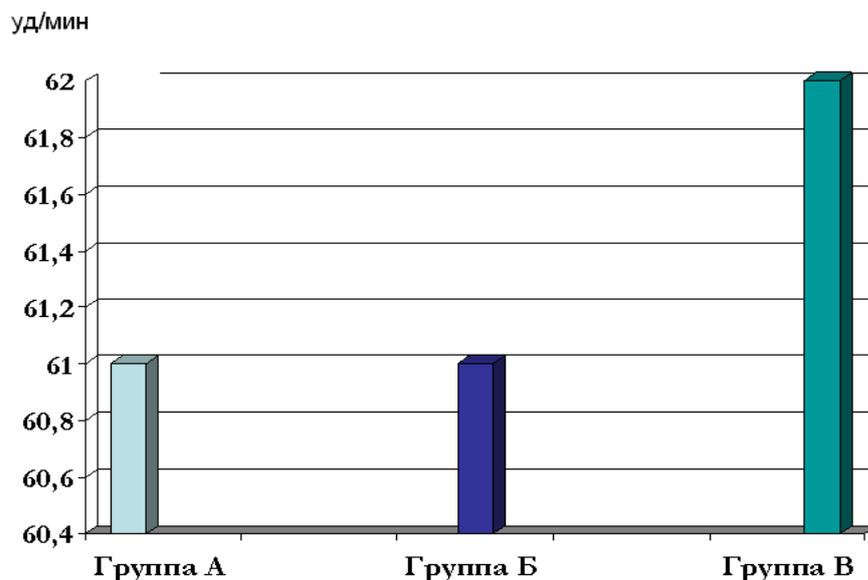


Figure 1. Resting heart rate indicators for male submariners

The highest rate of heart rate in men was observed in group B – 62 beats / min, in group A and B-61 beats/min, which has no statistically significant differences. The resting heart rate in women is shown in Figure 2.

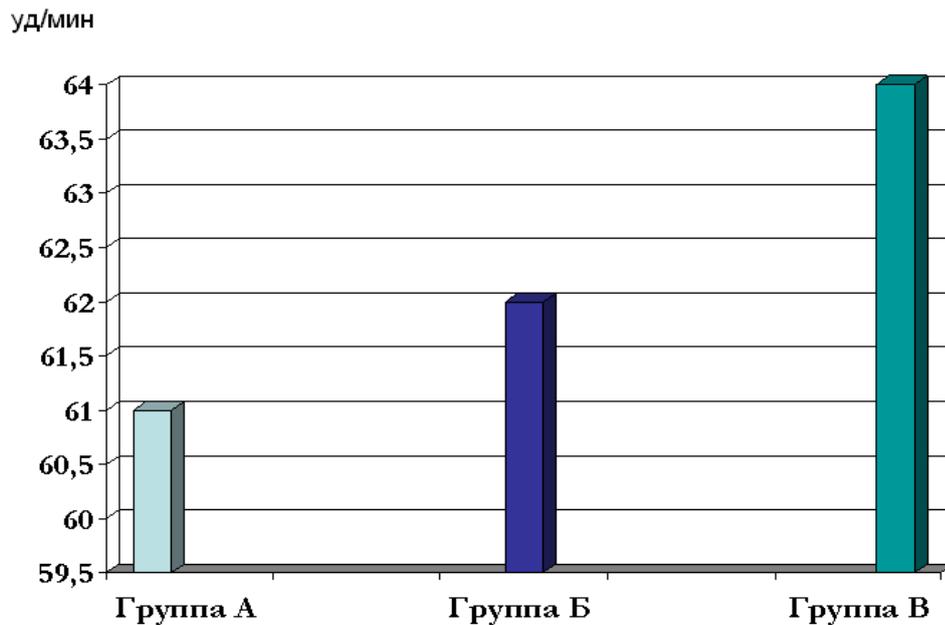


Figure 2. Resting heart rate indicators of submariners (women)

The highest rate of heart rate in women, depending on the time period, in group A was 61 beats / min , in group B-62 beats/min, in group B – 64 beats / min. It is possible to note a slight increase in heart rate at rest, which can be regarded as a positive effect on the cardiovascular system.

The heart rate is a sensitive marker of the state of vegetative homeostasis of the body, one of the first to respond to its changes during adaptation. Slowing of the heart rate at rest is associated with an increase in parasympathetic influences on the function of heart automatism. Some authors note a positive relationship between the volume of the heart and the power of contractions and an inverse relationship with the heart rate (the larger the heart, the more powerful the contractions, the lower the pulse). According to a number of authors who study the influence of the orientation of the training process on cardiac performance, it is noted that the highest values of heart rate in athletes who develop the quality of endurance. Our data are consistent with the data of S. K. Andreeva, who notes that in highly qualified submariners, the heart rate in men is 62 beats / min (intra-group spread of 48-80 beats/min), in women 65 beats/min (intra – group spread was 62-83 beats / min). It follows that underwater sports have a positive effect on the cardiovascular system.

Next, we decided to consider the participation of indicators of the cardiovascular system in the adaptation of the body to physical exertion, depending on the specialization. The resting heart rate indicators for male scuba divers specializing in sprint distances are shown in Figure 3. For stayers, in Figure 4, and for scuba divers, in Figure 5.

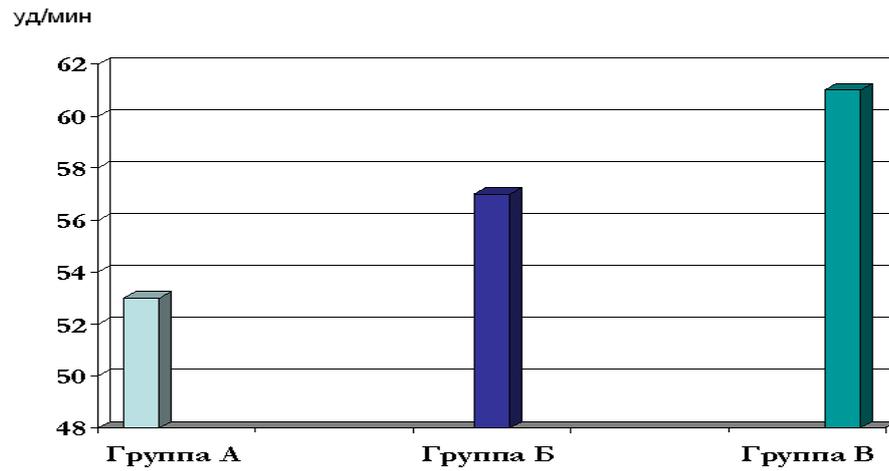


Figure 3. Indicators of resting heart rate in swimmers-submariners-sprinters (men).

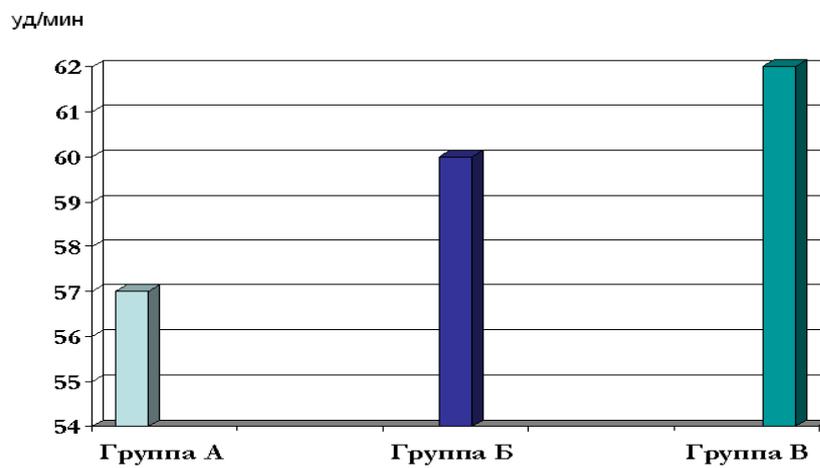


Figure 4. Resting heart rate indicators for Stayer submariners (men)

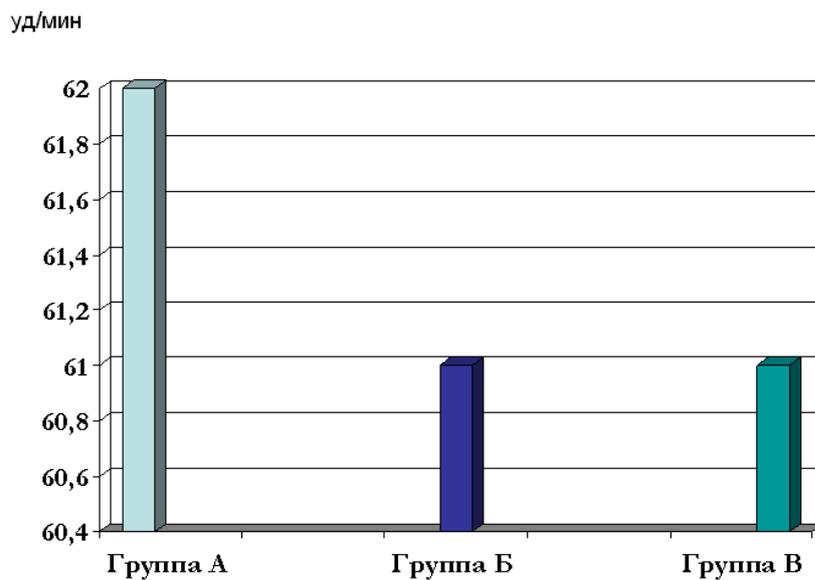


Figure 5. Indicators of resting heart rate in submariners (men)

The heart rate in the group of sprinters ranges from 59 to 62 beats / min., in group B from 56 to 57 beats / min., in group A from 52 to 54 beats / min.

The heart rate among stayers in group B ranges from 60 to 63 beats / min., in group B from 59 to 60 beats / min., in group A from 54 to 60 beats / min.

The heart rate among submariners in group B ranges from 61 to 62 beats / min., in group B from 59 to 61 beats / min. , in group A from 61 to 64 beats/min.

The cardiovascular system reacts sensitively to various influences, including strenuous physical activity, but the compensatory capabilities of the heart are not unlimited and if this is not taken into account, then you can get overexertion. In our case, it was found that the heart rate, regardless of specialization, reflects the functional level of the state of the cardiovascular system in accordance with different somatotypes.

The resting heart rate indicators for female scuba divers specializing in sprint distances are shown in Figure 6, for stayers in Figure 7, and for scuba divers in Figure 8.

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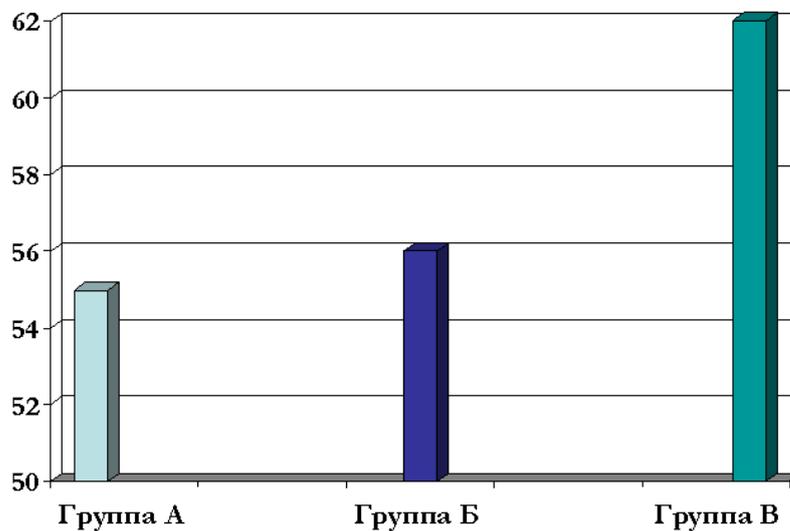


Figure 6. Indicators of resting heart rate in submariners and sprinters (women).

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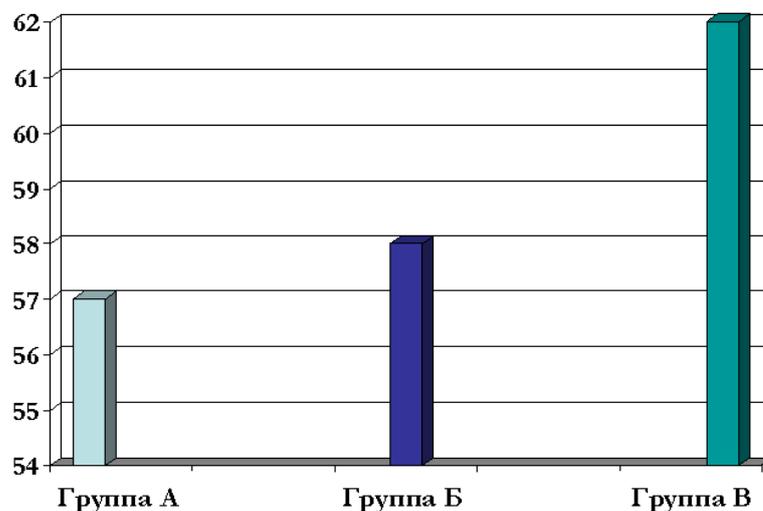


Figure 7. Resting heart rate indicators for Stayer submariners (women)

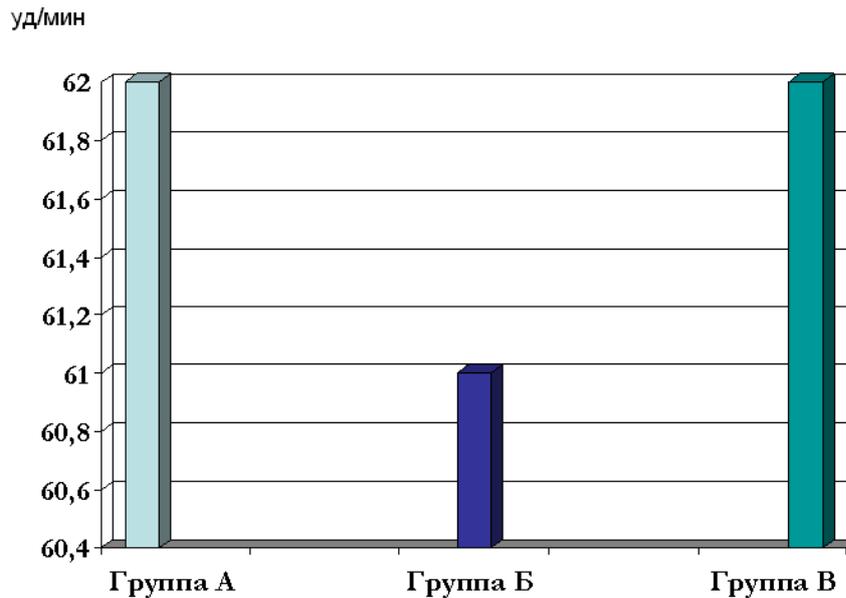


Figure 8. Indicators of resting heart rate in submariners (women)

The heart rate of sprinters in group B ranges from 62 to 63 beats / min., in group B from 55 to 57 beats / min., in group A from 54 to 56 beats / min.

Heart rate indicators in stayers range in group B from 62 to 63 beats / min., in group B from 57 to 59 beats / min., in group A from 55 to 60 beats/min.

Heart rate indicators for submariners in group B range from 60 to 64 beats / min., in group B from 59 to 61 beats / min. , in group A from 61 to 64 beats/min.

4. Conclusion. The cardiovascular system reacts sensitively to various influences, including strenuous physical activity, but the compensatory capabilities of the heart are not unlimited and if this is not taken into account, then you can get overexertion. In our case, it was found that the heart rate, regardless of specialization, reflects the functional level of the state of the cardiovascular system in accordance with different somatotypes.

For women who specialize in sprinting and scuba diving moderate bradycardia is noted, which indicates good adaptive functions to physical exertion, which is affected by the body position of the submariner swimmer. It is known that when lying down, the heart rate can decrease by 10 beats.

Male and female submariners of group B are characterized by higher rates of increase in resting heart rate (HR), compared to athletes of group A and B.

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