TACHO-OSCILLOGRAPHIC INVESTIGATION OF ARTERIAL PRESSURE IN THE RIGHT AND LEFT BRACHIAL ARTERIES IN DIFFERENT POSITIONS OF THE BODY AND DURING PHYSICAL WORK

V. V. Vasil'eva and N. A. Stepochkina

UDC 612.143.014.47

A tacho-oscillographic method was used to determine the arterial pressure in both brachial arteries of 100 healthy young subjects. In recumbency and when sitting, all blood pressure readings in both arms were equal. In the sitting position the pressure was lower than in recumbency. Under the influence of work with the right hand the systolic pressure fell in the arteries of the working limb and rose in the nonworking limb. The mean pressure rose to an equal degree in both brachial arteries.

Simultaneous measurement of the arterial pressure (AP) in the right and left brachial arteries was carried out on 100 healthy young males. The results are given in Table 1. In recumbency and the sitting position all AP readings were equal in both arms.

Under the influence of work with the right hand (lifting dumbbells sitting for 1 min) the systolic pressure fell in the arteries of the working limbs and rose in the nonworking limb (Table 1). Working hyperemia is due to vasoconstriction in nonworking parts of the body. Vessels of organs belonging to the physiological system which is sending afferent impulses are constricted first [1]. In these experiments this process was reflected by an increase in AP in the left brachial artery, evidently associated with constriction of arterioles of nonworking muscles.

Since the velocity of the blood flow in the main arteries of a working limb is considerably increased above the resting level, according to Bernoulli's equation, the piezometric pressure is decreased there. This may account for the decrease in final and lateral systolic pressure in the right brachial artery. As a result of dilatation of the arterioles of the working muscles, the total cross-section area of these vessels is increased. This sharp increase in volume of the vascular bed evidently causes damping of AP oscillations in the arteries of working limbs, as a result of which the systolic pressure falls slightly and the diastolic increases a little. The mean pressure in the brachial artery reflects to a greater degree than other parameters the level of the systemic AP. Since the mean pressure was increased equally in the arteries of both upper limbs, it can be postulated that the changes in it corresponded to reactions of the systemic AP to physical exertion.

TABLE 1. Arterial Pressure Readings in Right and Left Brachial Arteries in Different Positions of the Body and during Work with the Right Hand (M ± m)

AP	In recumbency		In sitting position		15 sec after work	
Reading	right arm	left arm	right arm	left arm	right arm	left arm
FSP	128±0,76	128±0,88	120±0,68	120±0,76	118±1,16	132±2,1
LSP	107±0,92	107±0,84	103±0,84	104±0,84	103±1,08	114±1,28
MP	86±0,54	86±0,66	82±0,52	82±0,60	85±0,60	85±0,96
DP	67±0,64	69±0,68	65±0,84	66±0,80	68±0,76	68±0,68

Legend: FSP – final systolic pressure; LSP – lateral systolic pressure; MP – mean pressure; DP – diastolic pressure.

Department of Physiology, P. F. Lesgaft Leningrad Institute of Physical Culture. (Presented by Academician of the AMN SSSR D. A. Biryukov). Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 67, No. 2, pp. 6-7, February, 1969. Original article submitted April 15, 1967.

LITERATURE CITED

1. V. M. Khayutin, Vasomotor Reflexes [in Russian], Nauka, Moscow (1964).