Glasnik Antropološkog društva Srbije / Journal of the Anthropologycal Society of Serbia
Novi Sad, vol. 44, str. 471-481, 2009, UDK 572(05), ISSN 1820-7936

AGE CHANGES IN THE MORPHO-FUNCTIONAL STATUS OF MEN WITH DIFFERENT PROFESSIONS

UDK 612.087.1-057

Emilia Andreenko

Departement of Human Anatomy and Physiology,
University of Plovdiv, Plovdiv, Bulgaria

Summary: The purpose of the present work is to study and assess the age changes in the basic features which characterize the morpho-functional status in men at active-working ages from different professional groups. 786 men were measured anthropometrically by Martin-Saller's method (1957-58). The men are representatives of 4 professions, which differ in conditions, nature and the subject of work as well: founders, carpenters, fitters, and drivers. They were divided in two age groups: 1st group [30-40 years old] and 2nd group [41-50 years old]. The data about 6 body lengths and proportions, 6 body diameters, 6 body circumferences and as well as 3 basic physio-metrical parameters: pulse rate, blood pressure and vital capacity. The results showed that the highest age changes were in the linear features, as well as in the diameters and circumferences, in the bodies of drivers. The age changes in construction and body measurements of the carpenters are considerably slighter. We observed a worsening of spirometric abilities in men of age 41-50, and higher blood pressures in carpenters and drivers.

Key words: males, professions, age, lengths, diameters, circumferences, functional status

Introduction

The modern level of development in human morphology requires the elaboration of various models of phenotypic variability proceeding from the influence of different exogenic factors (Павловский, 1987; Пурунджан, 1997; Pavlica et al., 2005; Pavlica et al., 2005). Nowadays, we live in the time of tremendous industrial progress and technical improvements related to it. There are new structures of job organization, as well as new relations among people. This integrates big groups of people in a united functional complex where people work in a uniform rhythm and pace and have close physical activity. In this sense, assuming the phenotypic variability of modern people as a very important matter, a question of present interest is the external factor in the labor activity of naturally-formed groups of people, such as professional groups (Кандрор et al., 1997; Мхитарян, 1981; Смирнова and Шагурина, 1986; Венда, 1971). The changes that occur with the age in the morpho-functional status of people working in different professional categories are a question of great interest in the present study.

The data is a part of a transversal anthropological research on people working for different enterprises in the district of Plovdiv (Bulgaria). The programme includes totally 84 morpho-metric features, from them 53 are absolute and 31 are derivative features. In the present study we put in observation the age changes in some of the basic somatic features that characterize the anthropometric and physiometric status of men from 4 professional groups.

Material and methods

786 men, at the age of 30-50 years, were measured anthropometrically with the method of Martin-Saller (1957-58); they were representatives of 4 different types of labor activity from the following professions: casters, fitters, carpenters and drivers. All individuals had working experience in the respective profession more than 10 years. They were divided in two age groups: 1st group - 30-40 years old and 2nd group – 41-50 years old. In the present study we analyze the records of the following metric features: *body lengths* – stature, length of head with neck, torso length, and lower extremity length. *Body diameters* – transversal and sagittal chest diameter, biacromial, bicristal, and bitrochanterial diameter. *Body circumferences* – chest circumference (in three positions: pause, inspiration and expiration), waist circumference, abdomen circumference. We calculated in addition the following *derivative features* – torso length proportion and lower extremity length (is.) proportion, acromio-cristal index, thoracal index (ratio sagittal/transversal chest diameter) and the respiratory difference (the difference in chest circumference inspiration and expiration). We also analyzed through the common methods 3 *physiometric features* – pulse rate, blood pressure (systolic and diastolic) and vital capacity of lungs. The records were processed statistically with the computer program SPSS-11 and we used the data of the Descriptive analysis. We did the comparison of the arithmetic average values of the particular scores in the two age periods through Student's t-test.

Results

Table1 presents the results from the descriptive analysis of the age changes in the values of linear features of the body and its segments. For a better visualness when we compared the differences, we specified in which of the two age periods the given feature has bigger (prior) average values. The average values of the stature decreases with the age advancing – significantly in fitters and drivers ($p<0,05$), and insignificantly in casters and carpenters ($p>0,05$). We received similar results for the length of proximal and distal segment of the body - length of head with neck and lower extremity length. The age differences in the middle body segment – torso length, are insignificant for the four professional groups ($p>0,05$). In all groups we did not find significant alterations in the average values of the two body proportions ($p>0,05$), except in drivers ($p<0,05$).

The age changes in the values of the basic body diameters are shown in Table 2. With the exception of the acromial width, the results show that the average values of the rest features from this group, as well as the both indices values, increase with the age advancing in all professional groups. The most significant changes occur in the

transverse sizes of fitters and drivers, then the casters, and the least significant in carpenters (p>0,05).

Table 1. Body heights, lengths and proportions

Features	Profession	(age group-1) 30-40 years		(age group-2) 41-50 years		Differ. ±	Priority$_1$ Priority$_2$	P
		Mean	SD	Mean	SD			
Stature [cm]	Casters	171.74	6.43	171.29	6.58	0,45		0,638
	Fitters	174.92	6.51	172.29	5.68	2,63		0,003**
	Drivers	173.54	6.95	170.48	6.76	3.06		0,001***
	Carpenters	172.09	6.94	170.12	5.97	1.97		0,030*
Length of head with neck [cm]	Casters	31.55	2.12	31.37	1.77	0.18		0,538
	Fitters	32.02	1.79	31.22	1.65	0.80		0,001***
	Drivers	31.80	2.02	30.79	1.67	1.01		0,0001****
	Carpenters	31.77	2.34	31.58	3.95	0.19		0,693
Torso length [cm]	Casters	51.69	3.78	52.11	4.68	0.42		0,072
	Fitters	52.72	3.25	52.39	3.16	0.33		0,470
	Drivers	52.89	3.62	53.19	3.67	0.30		0,556
	Carpenters	50.95	4.26	51.66	4.53	0.71		0,269
Lower extremity length (is.) [cm]	Casters	96.92	4.66	96.99	5.43	0.07		0,924
	Fitters	99.09	5.08	97.60	3.91	1.49		0,023*
	Drivers	98.26	4.87	95.74	4.67	2.52		0,0002***
	Carpenters	98.73	5.47	97.08	5.17	1.65		0,0002***
Torso length proportion	Casters	30.41	1.91	30.83	2.48	0.42		0.1891
	Fitters	30.15	1.68	30.42	1.74	0.27		0.2676
	Drivers	30.48	1.75	31.20	1.66	0.72		0.0029**
	Carpenters	29.94	2.61	30.47	2.54	0.53		0.0524
Lower extremity length (is.) proportion	Casters	56.46	1.64	56.28	1.92	0.18		0.4884
	Fitters	56.64	1.66	56.66	1.48	0.02		0.9293
	Drivers	56.60	1.54	56.16	1.54	0.42		0.0422*
	Carpenters	57.35	1.71	57.05	1.91	0.30		0.2592

* - P <0, 05; ** - P < 0, 01; ***- P < 0,001; ****- P < 0, 0001

In Table 3 you can see the age changes in the values of the basic circumferential body sizes. In all professional groups in the second age period, the average values of circumferential body sizes increase, while the respiratory difference decreases. Chest circumference in its three measure positions – pause, inspiration and expiration, increases significantly in casters, fitters and drivers (p<0,05), and insignificantly in carpenters (p>0,05). It is the same with the waist circumference. In abdomen circumference the changes with the age advancing are significant only in drivers (p<0,05).

Table 2. Body diameters and indexes

Features	Profession	(age group-1) 30-40 years		(age group-2) 41-50 years		Differ. ±	Priority$_1$	Priority$_2$	P
		Mean	SD	Mean	SD				
Biakromial diameter [cm]	Casters	39.41	1.91	39.50	2.16	0.09			0.762
	Fitters	39.92	1.99	39.28	1.89	0.64	%		0.021*
	Drivers	38.73	1.96	37.89	2.28	0.84	%		0.005**
	Carpenters	38.03	2.02	37.76	1.82	0.27	%		0.998
Transversal chest diameter [cm]	Casters	30.28	2.35	30.64	2.12	0.36		%	0.280
	Fitters	30.15	2.41	30.46	1.99	0.31		%	0.330
	Drivers	30.56	2.33	31.15	2.55	0.59		%	0.085
	Carpenters	30.31	2.13	30.76	2.03	0.45		%	0.137
Sagital chest diameter [cm]	Casters	22.43	2.07	23.40	2.19	0.97		%	0.006**
	Fitters	22.26	2.53	22.99	2.28	0.73		%	0.035*
	Drivers	22.58	2.44	23.62	2.41	1.04		%	0.002**
	Carpenters	22.98	2.42	23.43	2.42	0.53		%	0.202
Index Sagital / Transversal chest diameter	Casters	74.20	5.87	76.43	5.54	2.23		%	0.0090 **
	Fitters	73.93	6.91	75.57	6.66	1.64		%	0.0916
	Drivers	73.96	6.36	75.90	5.51	1.94		%	0.0208 *
	Carpenters	75.92	6.97	76.22	6.74	0.30		%	0.7635
Bicristal diameter [cm]	Casters	30.06	2.01	31.44	3.08	1.38		%	0.001***
	Fitters	29.61	2.31	30.61	2.07	1.00		%	0.001***
	Drivers	30.49	2.40	31.49	2.33	1.00		%	0.002**
	Carpenters	30.03	2.07	30.52	1.85	0.49		%	0.086
Bitrochan--terial diameter [cm]	Casters	30.96	2.33	31.31	2.49	0.35		%	0.322
	Fitters	31.21	2.21	31.35	2.05	0.14		%	0.646
	Drivers	31.82	2.55	32.46	2.32	0.64		%	0.062
	Carpenters	32.30	2.19	32.42	1.68	0.12		%	0.668
Acromio--cristal index	Casters	76.34	4.63	79.72	7.96	3.38		%	0.0003***
	Fitters	74.25	5.82	78.01	5.24	3.76		%	0.0001***
	Drivers	78.74	4.74	83.30	7.07	4.56		%	0.0000***
	Carpenters	79.07	5.25	80.90	4.75	1.83		%	0.0124

* - P <0, 05; ** - P < 0, 01; ***- P < 0,001; ****- P < 0, 0001

Table 3. Body circumferences

Features	Profession	(age group-1) 30-40 years		(age group-2) 41-50 years		Differ. ±	Priority$_1$	Prioriy$_2$	P
		Mean	SD	Mean	SD				
Chest circumference -pause [cm]	Casters	101.77	8.45	104.97	8.29	3.20		%	0.0103**
	Fitters	100.13	8.22	102.96	7.58	2.83		%	0.0131**
	Drivers	102.10	9.21	105.54	8.95	3.44		%	0.0073**
	Carpenters	101.47	7.81	103.23	7.78	1.76		%	0.1222
Chest circumference –inspiration [cm]	Casters	105.44	8.20	108.69	8.09	3.25		%	0.0074**
	Fitters	104.57	7.77	107.16	7.51	2.59		%	0.0184*
	Drivers	106.55	8.94	109.80	8.91	3.25		%	0.0098**
	Carpenters	106.39	7.39	107.46	7.48	1.07		%	0.3240
Chest circumference -expiration [cm]	Casters	97.69	8.09	101.70	8.76	4.01		%	0.0014**
	Fitters	95.36	7.89	98.84	8.09	3.48		%	0.0025**
	Drivers	98.44	9.21	102.63	8.98	4.19		%	0.0012**
	Carpenters	98.64	8.36	100.18	7.95	1.54		%	0.1947
Respiratory difference: (inspir. – expir.) [cm]	Casters	7.75	2.72	6.99	2.86	0.76	%		0.0647
	Fitters	9.21	2.54	8.32	2.51	0.89	%		0.0141*
	Drivers	9.11	2.49	7.17	2.95	1.94	%		0.0000****
	Carpenters	7.75	2.69	7.28	2.80	0.47	%		0.2416
Waist circumfe-rence [cm]	Casters	92.75	10.30	97.56	10.58	4.81		%	0.0020**
	Fitters	89.44	10.47	94.49	9.89	5.05		%	0.0006***
	Drivers	92.96	11.12	100.30	11.96	7.34		%	0.00001***
	Carpenters	94.37	9.55	96.75	10.65	2.38		%	* 0.1093
Abdomen circumfe-rence [cm]	Casters	106.16	7.48	107.85	8.35	1.69		%	0.1454
	Fitters	104.55	6.92	105.19	6.69	0.64		%	0.5102
	Drivers	104.39	8.12	106.60	7.48	2.21		%	0.0443*
	Carpenters	102.50	6.70	102.90	6.07	0.40		%	0.6660

* - P <0, 05; ** - P < 0, 01; ***- P < 0,001; ****- P < 0, 0001

The age changes in the values of the basic physiometric features are shown in Table 4.

The changes in the average values of pulse rate are insignificant with the age advancing in the men from all professions. In casters there is a significant increase in the systolic blood pressure (p<0,05), and in drivers and carpenters, except systolic, there is a significant increase in the diastolic blood pressure. The vital capacity of lungs decreases significantly in all professional groups in the period of 41-50 years (p<0,05).

Table 4. Physiometrical features

Features	Profession	(age group-1) 30-40 years		(age group-2) 41-50 years		Differ. ±	Priority$_1$	Prioriy$_2$	P
		Mean	SD	Mean	SD				
Pulse rate [beats/minute]	Casters	74.54	7.37	75.42	9.42	0.88		%	0.4713
	Fitters	73.72	8.93	74.89	8.19	1.57		%	0.3407
	Drivers	74.75	8,19	74.60	8.25	0.15	%		0.8962
	Carpenters	74.42	7.27	74.36	10.22	0.06	%		0.9635
Systolic blood pressure [mm Hg]	Casters	132.77	16.68	137.88	16.40	5.11		%	0.0374*
	Fitters	125.63	14.06	124.38	11.62	1.25	%		0.5115
	Drivers	124.38	11.62	134.85	14.83	10.47		%	0.00001****
	Carpenters	127.79	14.01	139.52	17.48	11.73		%	0.00001****
Diastolic blood pressure [mm Hg]	Casters	87.39	8.79	89.56	11.33	2.17		%	0.1391
	Fitters	83.38	10.92	83.62	7.42	0.24		%	0.8596
	Drivers	83.62	7.42	90.30	10.32	6.68		%	0.0001****
	Carpenters	86.86	10.49	91.90	9.84	5.04		%	0.0008***
Vital capacity [cm^3]	Casters	3672.97	637.35	3143.04	639.79	529.93	%		0.00001****
	Fitters	4023.87	665.27	3643.33	564.97	380.54	%		0.00001****
	Drivers	4143.33	564.97	3513.00	553.48	630.33	%		0.00001****
	Carpenters	3723.84	647.79	3328.57	584.78	395.27	%		0.00001****

* - P <0, 05; ** - P < 0, 01; ***- P < 0,001; ****- P < 0, 0001

Discussion

One of the external expressions of human ontogenesis is the typical for the certain moment body sizes and proportions. In his treatise "Biological Age of Humans" Pavlovskii (1987), gives a series of illustrations of the variants of age changeability in some morpho-metric features in the period between 20 and 50 years. The study ranges over thousands of individuals from the grown-up population of 20 ethno-territorial communities of the former USSR. The author thinks that the anthropometric features show variegated tendencies of changeability. For example, regarding the torso length and acromial width, the values decrease, and regarding the circumferential chest sizes and the index of chest shape (the relation between longitudinal and transverse size) get bigger. The values of bicristal diameter and some arm sizes are relatively more stable in the age aspect.

We decided to include in the present study those anthropometric features, proportions and indices, which can give a better idea about the changes in the body build and proportionality of workers, regarding their age and profession.

The stature is a basic and constant characteristic of human physical development in the lifespan. According to the categories adopted in Anthropology by Martin, R., we found about the stature that the average values of the workers from the four professions go in the category "high" – [170-179 cm], i.e. the men from both age groups: 30-40 and 41-50 years have high stature, according to the standards for the European population (Table 1). In our study the changes in the stature showed usual characteristics in ageing aspect. As expected, the older men have lower stature (41-50 years). Stature de-

creasing is a biological regularity and it is mostly due to the gradual increase of the physiological deformations with the age advancing (stooping or chest cyphosis), and also due to the shortening of the cartilage connections in joints. But we found that the stature differences of the men from the two age groups are the least expressed and insignificant ($p>0,05$) in the group of casters (barely 0,45cm), while they are the most expressed and significant ($p<0,05$) in the group of drivers (3,06cm). Probably, in parallel with the age changes, the compulsive sitting work pose of drivers at a big extent causes the changes in torso length in them. Purundjan (1997) found a similar negative effect of the character of the work pose on women working in polygraphy at the age between 16 and 59. He thinks that hypodynamy due to the sitting work pose in the profession, like an avalanche, causes an increase in spinal column deformations at a bigger extent in older people.

The dynamics of the age changes in sizes of the different body segments is very important because there are changes in the stature at the expense of their reduction. We found that the average values of torso length do not change significantly with the age in all professional groups ($p>0,05$). There are more changes in the other body segments. In carpenters the change in stature is due to the significant decrease in the lower extremity length with 1,65 cm ($p<0,05$). In drivers and fitters, together with the decrease of lower extremity length (2,52 cm; 1,49 cm) the length of the upper body segment, head with neck, also decreases significantly (1,01 cm; 0,80 cm). The changes with the age advancing are the weakest in casters. The insignificant changes in the lengths of the three body segments ($p>0,05$) cause the insignificant change of the stature in them ($p>0,05$).

Smirnova and Shagurina (1986), announced results from a similar study about the age dynamics in the length of the separate body segments in adult individuals. The authors studied transversally 1000 men at the age 20-59 years from Abkhazia and they recorded a decrease in the corpus (torso and length of head with neck) with 1,8 cm, and also decrease in the lower extremity length with about 1,0 cm. According to the authors, the lower extremity length reduces at the expense of the changes in foot vaults and confined flexibility of joints. The data of Mhitarian (1981), are different. The author examined 987 men from Dagestan at the age 25-54 years. The excerption includes people from cities and villages and it has a big assortment of professions as well. According to this researcher, there is practically no age changeability in the elements of the axial skeleton (length of upper segment of the body and torso). As a whole, he points to the fact of an unchangeable stability in the length sizes of the skeleton in the men from Dagestan.

The two proportions, included in our study, present tentatively in percentages the relation between torso length and lower extremity length toward the stature. The average values of the two proportions in the men from all professions, 30-40-year-old, go in the categories – long torso [over 29,9] and long lower extremity [over 54,1]. With the age advancing the values barely change, except these of drivers which increase significantly ($p<0,05$). However, as a whole, the categories of the older men from all professions (41-50 years) do not change and remain the same – relatively long torso and long lower extremity.

Body diameters are morphology features that give a general idea about the development of the transverse body sizes and the massiveness of body skeletal parts –

shoulders, chest, and pelvis. In our study we found age changes in almost all features from this group, except the bitrohanterial diameter and transverse chest diameter (Table 2). The bicristal diameter gets significantly bigger in casters, fitters and drivers ($p<0,05$). In fitters and drivers together with this, the biacromial diameter significantly decreases ($p<0,05$). We found the smallest changes of the transverse body sizes in carpenters. In them the acromial and bicristal diameters do not change significantly with the age ($p>0,05$). This is the same with the acromio-cristal index, as the two diameters. The older casters, fitters and drivers have significantly bigger values of the index and this shows that their bodies have wider pelvis than shoulders. It is indicative that the value of acromio-cristal index with the age in drivers is the biggest of all professional groups (4,56). The result has a very high statistical significance ($r < 0, 0001$) and it can be explained with the profession of drivers and their work pose which is compulsively sitting. Venda (1971) has similar findings. He thinks that when people work for a long time and their body parts have a close contact with definite elements of the machines, then there are changes in the spatial measures of the body. The author thinks that if you sit on a chair, the size "pelvis width" gets significantly bigger and this fact should be taken in consideration by the designers in ergonomic designing the width of chairs and seats.

The transverse and sagittal chest diameters and the thoracic index characterize chest measures and shape and they determine its ability for the breathing excursions in respiration. Regarding the transverse diameter, there are not any actual changes in the two age periods ($p>0,05$). The changes in the chest shape are more considerable in the front-back direction. The sagittal diameter is bigger in all men of the order of 0,53-1,04 cm. There is also a similar tendency of growth in the thoracic index and the age changes are mostly expressed in casters and drivers ($p<0,05$). This common line of changes in all studied groups points to the fact that there is a relatively similar chest development with the age in the frontal and sagittal plane as well. Mhitarian (1981) received results similar to ours. In his study on the age changes in body diameters of men from Dagestan (25-54 years), he points to the changes in the chest shape as the most remarkable. It happens mainly at the expense of the increase of the front-back diameter in which the chests of the older men acquire a relatively rounder section.

The circumferential features of the body are morphology characteristics that are naturally dependent on the development of muscularity and subcutaneous fat tissue (SFT). In our study the values of chest circumference in its three positions – pause, inspiration and expiration – get bigger with the age: significantly in casters, drivers and fitters ($p<0,05$), and insignificantly in carpenters ($p>0,05$) (Table 3). On the ground of bigger chest circumferences, the maximal respiration amplitude (inspiration-expiration) decreases in older men which is especially distinguished in drivers and fitters ($p<0,05$). This means that together with the increase of soft tissues in the regions of the breast and the back, there is also a negative, age change in chest elasticity.

Age changeability of waist and abdomen circumferences is, at a definite extent, a result of the age increase of the SFT in the regions of the pelvis and abdomen. Our findings show that the waist circumference is put under more active age changes than the abdomen circumference. The differences in the values of waist circumference in men from the two age groups is between 2,38cm and 7,34 cm, and the values of abdomen circumference – between 0,40cm and 2,21 cm. In different professions if com-

pared, it is clear that the age additions to the average values of the two circumferences are the smallest in carpenters, while the biggest – in drivers: almost three times bigger in comparison with the carpenters about the waist circumference and over five times bigger about the abdomen circumference. It means that, with the age advancing, the most distinct accumulation of inert mass (SFT) and volume increasing in the lower body part occur in drivers.

The morpho-functional unity of human organism determines the basic physiometrical features to be included in the complete anthropological characterization of the individual (Table 4).

The physiometrical features are indicators about person's health condition and their values depend directly on the individual's morphological status, age and physical activity. The pulse rate is an indicator for the heart function and also for cardiovascular system. Pulse rate is an indicator of the heart function and the condition of the cardiovascular system. It is clear from the data that there are not any significant age differences in this feature ($p>0,05$) as the values of men from the two age groups are within the physiologic standards. The optimal values and the lack of significant differences in the rate of heart contractions between the younger and the older men from each profession is a positive result. Obviously, when working in a different way, the heart function of 30-40-year-old men reaches a stable balanced condition which also remains stable at the level of its working rhythm in the later age period 41-50 years.

However, the changes in the blood pressure are significant. Its values get bigger and this correlates with the ageing and with the specific type of the physical activity, too. In casters there is a significant increase ($p<0,05$) of systolic blood pressure (with 5,11 mm Hg), and in carpenters and drivers not only systolic (with 11,73 mm Hg and 10,47 mm Hg) but the diastolic blood pressure gets significantly higher (with 5,04 mm Hg and 6,68 mm Hg). Although they do not exceed the limits and they correspond to their highest confines, the changes in the values of blood pressure in these professions are a very indicative fact. Probably, the hard and exhausting physical activity of casters and carpenters, as well as the high nerve-emotional tension in the process of work of drivers, play some negative role for the cardiovascular system. Only in fitters we did not find a significant increase of blood pressure of the older men ($p>0,05$). Obviously, the moderate and even light physical activity in the work of fitters that includes automatic and usual movements and it does not cause big work-load, and it helps fitters to have a specific hemodynamic status in comparison with the other groups of physical activity. Kandror et al. (1977) did similar morpho-physiological research. They compared 402 men – locomotive drivers and fitters, at the age 30-50, divided in two groups – under 40 and over 40, with work experience more than 5 years. Their results show a lower level of functional condition of the cardiovascular system and a lower physical efficiency in locomotive drivers compared to fitters, and it is more distinct in the older age group.

The vital capacity of lungs is also an important indicator for the common physiometric characteristic of the groups under our observation. The values of this indicator strongly depend on the gender, age and some somatic features - stature, torso length, chest parameters. The results show a significant decrease of the vital capacity of all men at the age of 41-50 years ($p<0,05$). In a comparative professional aspect, the decrease is more distinct in drivers (with 630,33 cm^3) and casters (with 529,93 cm^3), while

it is weaker in carpenters (with 395,27 cm^3) and fitters (with 380,54 cm^3). The decrease in the spyrometric abilities in drivers, carpenters and fitters we explain mostly with the age decrease of the stature, as well as the change in chest elasticity. In casters, however, we did not find any significant age differences in stature between the younger and older men. Probably, the decrease of respiratory abilities in them is due to the effects of the harmful conditions of working environment.

Assuming the results of the analysis done above, we got to the following conclusions:

1. We analyzed, in age and professional aspect, the variability of some basic morphometric and physiometric features of men working in different kinds of physical activity. The age significantly influences almost all features that were analyzed, except the torso length, bitrohanterial diameter, transverse chest diameter and pulse rate.

2. It is specific that the older men have shorter stature, bigger body massiveness, pelvis widening and a bigger front-back section of the chest. In spite of the fact that the absolute body sizes and the two end segments - head with neck and lower extremity - reduce, the proportions of the body remain relatively stable as a whole.

3. The age changes found in the features that characterize the chest - (diameters, circumferences and respiratory amplitude) prove a transformation in the chest cage shape, an increase of the soft tissues in the regions of the breast and back, as well as a decrease of the elasticity of the chest muscularity.

4. The certain type of profession also influences the somatic changes occurring with the age advancing. The biggest age changes in the linear features and also in diameters and circumferences of the body are in drivers, and the least – in carpenters. We can assume the bigger changes in the body construction and measurements in drivers as a specific type of adaptational reaction to the profession and its compulsive sitting work pose.

5. The results from the physiometric study show a lack of any significant age differences in the values of the pulse rate, higher blood pressure values (at the highest limits of the norm), as well as lower vital capacity. Hemodynamic features and spyrometric abilities of fitters with the age are the most optimal. In the rest three professions, we relate the functional condition of the cardiovascular and respiratory system to the age change in the somatic features, and also to the more difficult functional adjustment and adaptation of an organism to the specific labor conditions.

References

Кандрор, Н.С., А.Б. Кирпичников, Н.Ю. Лутовинова, М.И. Уткина, В.П. Чтецов (1977): Антропологическая характеристика и показатели физической работоспособности у представителей некоторых профессии. - Вопросы Антропологии, 57, 56-74.

Мхитарян А.А. (1981): Некоторые данные по морфологии тела мужкого население Дагестана в возростном аспекте. - Вопросы Антропологии, 67, 94-101.

Смирнова, Н.С., Т.П. Шагурина. (1986): - Возрастные изменения некоторых морфологических признаков у Абхазов. - Вопросы Антропологии, 76, 59-71.

Венда В.Ф. (1971): Проблемы приспособл. условия труда к человеку. - Эргономика, "Мир", М.

Павловский О.М. (1987): Биологический возраст человека. - Московский Университет, 280 с.

Пурунджан, А.Л. (1997): Основные закономерности пространственной дифференциации соматических особенностей населения России и сопредельных стран. Автореф. Дис. М., 59 с.

Pavlica T., Božić-Krstić V., Rakić R. (2005): Some anthropological characteristics of adult populations of the Northwest Bačka, Proceedings of the Balkan Scientific Conference of Biology in Plovdiv (Bulgaria) from 19 th till 21 st of May 2005, 173-184.

Pavlica T., Božić - Krstić V., Rakić R., Savić M. (2000): Anthropological characteristics of the population of Srem according to native origin, Zbornik Matice srpske, No 99, str 55-62, Novi Sad.

STAROSNE PROMENE U MORFO-FUNKCIONALNOM STATUSU MUŠKARACA RAZLIČITIH ZANIMANJA

Izvod

Cilj ovog rada je da u osnovnim crtama prouči i proceni starosne promene koje karakterišu morfo-funkcionalni status muškaraca u radno-aktivnom dobu iz različitih grupa zanimanja. Izvršeno je antropometrijsko merenje 786 muškaraca po Martin-Saller-ovom metodu (1957-58). Muškarci su predstavnici 4 zanimanja koja se razlikuju po uslovima, prirodi, kao i predmetu rada: livničari, stolari, monteri i vozači. Oni su bili podeljeni u dve starosne grupe: prva grupa (30-40 godina starosti) i druga grupa (41-50 godina starosti). Predstavljeni su podaci o 6 telesnih dužina i proporcija, 6 telesnih dijametara, 6 telesnih obima, kao i 3 osnovna fiziometrijska parametra: brzina pulsa, krvni pritisak i vitalni kapacitet. Rezultati su pokazali da su najveće starosne promene bile u linearnim crtama, kao i u dijametrima i obimima na telima vozača. Starosne promene u konstrukciji i telesnim merama stolara su znatno blaže. Uočeno je smanjenje spirometrijskih sposobnosti kod muškaraca u dobi 41-50 godina, i povišen krvni pritisak kod stolara i vozača.

Ključne reči: muškarci, zanimanja, starost, dužine, dijametri, obimi, funkcionalni status