AGE-SPECIFIC APARAMETERS OF THE HEART IN PATIENTS WITH COMBINED MITRAL DEFECT

Abstract: Using ultrasound examination with age-related features significantly expands the possibility of studying intimate mechanisms of functioning of the heart in normal and pathological cases. It would allow to establish many age-related patterns of disorders not only during systole, but also in diastole in various diseases of the cardiovascular system, indicate the initial signs of development of cardiac failure, objective estimating the role of several compensatory mechanisms, influencing different functional tests, which has invaluable importance for practical medicine.

Key words: Age-related features of cardiac echoparameters, combined mitral defect, diameter of aortal ring.
It is known that the frequency of heart damage in rheumatism (A.V. Zuinyumanov et al., 2013) is in the first place (44%), mitral valve damage is in the second place – aortic valves (20%). According to some authors (L. A. Bokeria A.V. Sandrikov et al., 2007), this defect occurs in 50% of patients with various heart defects. A number of scientists note that there is a link between age and diseases. With age, the adaptive capabilities of the body decrease, resistance to harmful effects decreases, vulnerabilities in the self-regulation system are created, and mechanisms of susceptibility to age-related pathology are formulated (V. V. Frolikis, 1986, V. M. Dilman, 1987). Thus, the frequency of acquired defects in men under 30 years of age is 3.9%, in men and women 10.3%, in 30-39 years, respectively, 5.6% and 14.0%, 41-49 years-8.4% and 18.4%, 50-54 years-5.0 % and 11.8% (Yu.a. Vlasov, 1985) in this regard, we have studied the echoparameters of the heart in this pathology, since they represent a certain clinical value.

**Purpose of research.** The aim of the study was to determine aparametric of the heart in combined mitral defect in the age aspect.

**Material and methods of research.** The material of the study was practically healthy people and patients with combined mitral defect (CMD) aged from 20 to 49 years.

The materials were studied at 5-year intervals, according to the recommendations (O. A. Vlasova 1985). The ultrasonic device "Aloka SSD – 630 (Japan) with frequency characteristics of sensors 3-3.5 MHz was used. To assess the echocardiographic parameters of the heart, we performed standard measurements (according to V. V. Mitkov, 1996). The obtained digital data were processed by the variational-statistical method (according to B. A. Nikityuk, 1985).

**Results and discussion.** The results of the study showed that the diameter of the aortic ring in patients with combined mitral defect (CMP) in comparison with the control group, in all age periods, narrows especially noticeably at the age of 25-29 years (2.3±0.05 to 1.69±0.08 cm) 40-44 years (2.4±0.7 to 2.6±0.2 cm).

The data showed that in patients with CMP, compared with the control, in all age periods, the diameter of the aortic opening increases, especially the most intensively increases in 40-44 years (from 2.78±0.2 to 3.1±0.1 cm).

The length of the left ventricle (LV) during diastole in patients with ILC in almost all ages increased, compared to control, while the greatest in the 35-39, 20-24, 30-34, 25-29 (from 6.3±0.3 mm 7.0±0.3 cm; from 6.6±0.2 to 6.8±0.6 cm; from 6.9±0.3 to 7.3±0.19 cm; from 6.7±03 to 7.2±0.2 cm) at age 45-49 are somewhat
smaller and only at the age of 40-44 years, long left ventricle during diastole remains almost unchanged.

LV length during systole, compared with the control, significantly increases in patients with CMP aged 20-24 years (from 4.95±0.4 to 6.9±0.6 cm), 35-39 years (from 5.1±0.2 to 7.2±0.2 cm) and significantly at the age of 25-29 years (from 5.1±0.35 to 6.2±0.2 cm), 45-49 years (from 5.7±0.3 to 6.9±0.2), and in other age periods significantly less.

The width of the left ventricle during diastole in patients with CMP is most expanded at the age of 35-39, 20-24, 30-34 years (respectively: from 3.6±0.1 to 6.0±0.35 cm; from 3.95±0.4 to 6.0±0.3 cm; from 4.2±0.2 to 5.8±0.3 cm), in two cases 25-29 and 45-49 years less noticeably (respectively: +1.3, +1.23 cm), and in one case at the age of 40-44 years, the width decreases. At the same time, the LV width during systole in patients with CMP in all age groups, compared with the control, increases, especially significantly in 20-24, 30-34 and 35-39 years (respectively: from 3.35±0.3 to 4.8±0.18 cm; from 3.2±0.3 to 5.3±0.2 cm; from 5.3±0.3 cm).

The length of the left atrial LP during diastole, in comparison with the control, increases most in 30-34, 35-39 and 40-44 years (respectively: from 4.2±0.3 to 5.7±0.1 cm; from 4.15±0.2 to 4.6±0.2 cm; from 3.75±0.3 to 5.1±0.2 cm), and in other age groups slightly less. At the same time, the length of the LP during systole in patients with CMP expands most at the age of 30-34, 35-39 years (from 3.1±0.1 to 4.8±0.1 cm and from 3.45±0.1 to 4.0±0.2 cm), and in other age periods the growth is slightly less.

The width of the LP during diastole in patients with CMP, compared with the control group, increases most in 35-39 years (from 3.15±0.2 to 3.7±0.3 cm), at the ages of 20-24, 30-34, 40-44 and 45-49 years, slightly less, and only at the age of 25-29 years, the width of the LP during diastole remains unchanged. At the same time, the width of the LP during systole in all studied ages, in comparison with the control, expands, especially in 35-39 years (from 2.7±0.25 to 3.15±0.2 cm), and in other age periods the growth is significantly less.

The length of the right ventricle (RV) during diastole in patients with CMP, compared with the control group, increases most in 40-44 and 30-34 years (from 5.0±0.3 to 7.6±0.3 cm and from 5.5±0.2 to 6.9±0.3 cm), and in other ages slightly less. However, at the age of 45-49 years, this length, on the contrary, is shortened by an average of 1.4 cm.
Studies have shown that, in three age periods (20-24, 25-29 and 30-34 years), the length of the pancreas during systole decreases (from 4.1±0.2 to 6.0±0.3 cm; from 4.0±0.3 to 5.2±0.2 cm and from 4.3±0.2 to 5.5±0.3 cm, and in other age periods increases (from +0.21 to +0.87 cm).

The width of the pancreas during systole, compared with the control group, at the age of 25-29, 30-34 and 45-49 years expands (from 3.1±0.3 to 3.55±0.3 cm; from 2.95±0.25 cm and 2.8±0.2 to 4.9±0.6 cm), and in other age periods this width narrows (on average from 0.2 to 0.5 cm).

The length of the right atrium during diastole in all studied age periods expands, especially significantly in 30-34 and 40-44 years (from 4.35±0.3 to 5.5±0.1 cm and from 4.35±0.4 to 6.7±0.3 cm), and in other ages it is slightly less.

The length of the PP during systole in patients is most extended at the ages of 30-34 and 40-44 years (from 3.65±0.1 cm to 4.9±0.1 cm and from 3.6±0.3 to 5.25±0.2 cm, respectively), and in other ages it decreases and becomes less than in the control (by 0.3-0.4 cm).

The width of the PP during diastole in patients with CMP most intensively changes at the age of 20-24, 30-34 and 35-39 years (from 3.48±0.2 cm to 4.7±0.3 cm, respectively; from 3.65±0.3 to 4.5±0.3 cm and from 3.7±0.2 to 4.65±0.2 cm), and in other age periods does not change significantly (up to 0.1 cm).

Width of PP during systole from 20 to 34 years increased (on average from 0.18 to 0.42 cm), especially in the age of 35-39 years (from 3.35±0.2 to 4.7±0.35 cm), and aged 40 to 49 years – even less than in controls (average from 0.3 to 0.7 cm)

**Discussion.** Studies have shown that the length and width of the LV, LP, during diastole and systole in almost all studied ages with CMP is greater than in the control. As for the length and width of the LP in CMP at the age of 20 to 29 years is almost the same, in 30-49 years more. Length of RV during systole at the age of 20-24 are the same, 25-44 years ( ), 45-49 years is less than (0.1 cm) than in controls, and during systole in the age of 20-44 years (from 0.4 to 2.0 cm), 45-49 years identical regulation.

The width of the pancreas during diastole and systole at the age of 20-24 years is almost the same as the norm, in 25 to 34 years with CMP less (0.3-0.47 and 0.18-0.41 cm), and in other ages more (up to 1.5 cm).
Length of PP during diastole in the age of 20-29 years is nearly identical to the control, while in the other studied ages (up to 2.1 cm) at systole in age from 20 to 44 years (0.2 to 0.25 cm), and 40-44 years – less (0.4 cm),

The width of the PP in diastole and systole in CMC in almost all studied ages is greater (from 0.1 to 0.7 cm) than the control.

Comparing our data with literature sources, we can note that the increase in the size of the LV and RV in CMP during diastole is more variable than in systole, which is consistent with clinical studies (V. A. Sandrikov et al., 2007). We fully agree with the views of N. M. Muharlyamov (1997), who noted that the anterior-posterior size of the LP increases sharply (up to 11 cm) with CMC. Our data are close to those of A. G. Avtandilov et al. (2001). These authors found that the length and width of the LV during diastole and systole are almost 1.5 times larger in CMP compared to mitral valve prolapse. Noted by V. E. Sinitsina et al. (1989) in patients with hypertrophic cardiomyopathy (increases from 16 to 54 years), the LP diameter is 40.2±1.4 mm, the LV diastolic size is 48.1±1.1 mm, and the systolic size is 40.2±1.4 mm, smaller than ours. Since these authors combined patients aged 16 to 54 years in one group.

**Conclusions.**
1) the length and width of the LV during diastole and systole in CMP in all studied ages is greater than the control.
2) the length and width of the LP in CMP at the age of 20-29 years are almost the same with the control, 30-49 years more.
3) the length and width of the left ventricle during diastole in CMP at the age of 20-24 years are identical with the control, in 25-44 years more (up to 1.5 cm), in 45-49 years less (up to 1.0 cm), and in systole at 20-44 years more (0.4 - 2.0 cm), in 45-49 years is identical with the control.
4) the length of the PP in diastole with CMP in 20-24 years is the same as the control, and in other ages it is longer (up to 2.0 cm), and in systole from 20-44 years more (by 0.2 - 2.5 cm), in 45-49 years less (up to 0.4 cm). The width of the PP in diastole and systole in all studied ages is greater (from 0.1 to 0.7 cm) than in the control.

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