

Characteristic Features of The Parameters of The Heart in Patients with Combined Mitral Malformations

Kutlikova G. M.

Candidate of Medical Sciences, Associate Professor

Department of Internal Medicine Andijan State Medical Institute Andijan, Uzbekistan

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.

Keywords: Age-related features of cardiac echoparameters, combined mitral defect, diameter of aortal ring.

Introduction

It is known that in terms of the frequency of heart damage in rheumatism in the first place (44%), there is a defeat of the mitral valve in the second – the aortic valves (20%). According to some, this defect occurs in 50% of patients with various heart defects. A number of scientists note that there is a connection 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, mechanisms of susceptibility to age-related pathology are formulated. Thus, the frequency of acquired defects in men under 30 years of age is 3.9%, in men, in 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% in this regard, we have studied the echoparameters of the heart in this pathology, since they represent a certain clinical significance.

The purpose of the study:

To determine the echoparameters of the heart in the 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 malformation (CMV) aged 20 to 49 years.

The materials were studied in 5-year intervals, according to the recommendations. At the same time, an 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. The obtained digital data were processed by the variational-statistical method.

Results and discussion

The results of the study showed that the diameter of the aortic ring in patients with combined mitral malformation (CMV) 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)

Data showed that in patients with CMI, compared with the control, in all age periods, the diameter of the aortic opening increases especially most intensively 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 CMC increases in almost all ages, compared with the control, with the greatest in 35-39, 20-24, 30-34, 25-29 years (from 6.3 ± 0.3 to 7.0 ± 0.3 cm; from 6.6 ± 0.2 to 6.8 ± 0.6 cm; from 6.9 ± 0.3 up to 7.3 ± 0.19 cm; from 6.7 ± 0.3 to 7.2 ± 0.2 cm) at the age of 45-49 years, slightly less and only at the age of 40-44 years, the LV length during diastole remains almost unchanged.

The length of the LV during systole, compared with the control, increases significantly in patients with CMR 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 noticeably at the age of 25-29 years (from 5.1 ± 0.35 to 6.2 ± 0.2 cm), 45-49 years old (from 5.7 ± 0.3 to 6.9 ± 0.2), and in other age periods significantly less.

The width of the LV during diastole in patients with CMP expands most 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 CMC patients 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 atrium of the 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 the groups are slightly smaller. At the same time, the length of the LP during systole in CMC patients 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 somewhat less.

The width of the LP during diastole in patients with CMI, compared with the control group, increases most at 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 is 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, compared with the control, expands, especially at 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 CMI, 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, this length, on the contrary, shortens 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 ages 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 (PP) 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 slightly less.

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

The width of the PP during diastole in patients with CMP varies most intensively at the ages 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 significantly does not change (up to 0.1 cm).

The width of the PP increases during systole from 20 to 34 years (on average from 0.18 to 0.42 cm), especially noticeable at the age of 35-39 years (from 3.35 ± 0.2 to 4.7 ± 0.35 cm), and at the age of 40 to 49 years – even less than in the control (on average from 0.3 to 0.7 cm)

Discussion

Studies have shown that the length and width of 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 at the age of 20 to 29 years is almost the same, 30-49 years more. The length of the pancreas during systole at the age of 20-24 years is the same, at 25-44

years more, at 45-49 years less (by 0.1 cm) than in the control, and during systole at the age of 20-44 years more (from 0.4 to 2.0 cm), at 45-49 years is identical with the norm. 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).

The length of the PP during diastole at the age of 20-29 years is almost the same as the control, and in the rest of the studied ages it is longer (up to 2.1 cm), with systole at the age of 20 to 44 years it is longer (0.2-0.25 cm), and in 40-44 years it is less (by 0.4 cm). The width of the PP in diastole and systole at CMC in almost all studied ages is greater (from 0.1 to 0.7 cm) than the control. Comparing our data with literature sources, it can be noted that the increase in the size of the LV, the pancreas with CMP during diastole is more variable than in systole, which is consistent with clinical studies. We fully agree with the opinions of N.M.Mukharlyamov (1997), who noted that the anterior-posterior LP size increases sharply (up to 11cm) with CMR. Our data are close to the data of A.G.Avtandilov et al.(2001). These authors found that in CMR, compared with mitral valve prolapse, the dimensions of the length and width of the LV during diastole and systole are almost 1.5 times larger. Noted by V.E.Sinitsina et al. (1989) in patients with hypertrophic cardiomyopathy (increases from 16 to 54 years), the diameter of the LP is 40.2 ± 1.4 mm, the diastolic LV size is 48.1 ± 1.1 mm, systolic 40.2 ± 1.4 mm, less than ours. Since these authors combined patients aged 16 to 54 years into one group.

Conclusions

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