12.2 Cardiometrical analysis of ECG. Level of its diagnostic capabilities

The following parameters can be diagnosed based on the cardiometry science: hemodynamics parameters, myocards metabolic process and CVS functions. Mathemantics is a tool for analysis. ECG is the information-bearing signal. RhEOgram is an ancillary signal. The above-mentioned parameters are sufficient to make accurately the diagnosis, do prognostication and to follow up the therapy.

The diagnosable parameters:

1. Metabolic characteristics of cardiac muscles: oxygen, lactate, creatinephosphate.

2. Cardiovascular system functional characteristics:

- contractile function of IVS
- contractile function of miocardium
- venous blood circulation condition
- aorta diastolic pressure build-up function
- function of myocardium relaxation in early diastole phase;
- presence of high systolic pressure
- depletion of blood flow in the left and right coronary arteries stomas
- gating of systemic and pulmonary blood circulation systems.

The extrasystole sources caused by arteriovenous fistulas functioning (all types of arrhythmia).

The extrasystole sources caused by the fibroblasts potential influence leading to sudden cardiac death.

3. Hemodynamic parameters:

MV – minute volume of blood, l/min.

SV – stroke volume of blood, ml

PV1 –volume of blood that flows to ventricle during the early diastole that characterizes the sucking-on function of ventricle, ml

PV2 – volume of blood that flows to left (aortic) ventricle of the heart in the atrial systole phase, characterizes the atrial transport function, ml

PV3 – volume of blood ejected by heart ventricle in the rapid ejection phase, ml

PV4 – volume of blood ejected by heart ventricle in the slow ejection phase, ml

PV5 – volume of blood (SV portion) transferred by ascending aorta in function of the peristaltic pump, characterizing the aorta tonus, ml.

4. System characteristics:

- CVS state stability
- phase volumes of blood – to – early diastole volume relation
- momentary and mean value of cardiac rate.

5.Psycho-physiological characteristics:

- type of physiological adaptive response
- attention concentration level.

12.3 Decision making in case of discrepancy between data obtained in practice using the cardiological and cardiometrical methods

Let us consider the comparison of diagnosis obtained using the classical cardiology method and cardiometry method from the interchangeability point of view. The classical standard approach is sufficiently limited (Fig. 131). It was developed and did not advance because it is based on multiple contradictions.

It is reasonable to apply the superposition principle, i.e. to apply one function to a result of another function. This approach is used in physical science that is based on natural science laws. For this purpose, the result obtained through the cardiology methods can be described using the cardiometry functions. In spite of the possible contradictions, this approach allows to introduce the logical induction into standard reasoning, thus resulting in making the precise diagnosis, appropriate and effective medical treatment and predictive modeling of the further progress of the disease. At that, the essence of the standard diagnose is preserved.

So, it is required to match the most important contradictions in the block-outs assessment.

1. Block-outs (12.1.2) and rhythm disturbance (12.1.10).

Any block-out shall be assessed from the position of the compensating mechanism inherent to the individual features of the coronary arteries, or caused by the fibroblasts existing in SA and AV nodes area, or by arteriovenous fistulas work. In medical report, it is recommended to make the

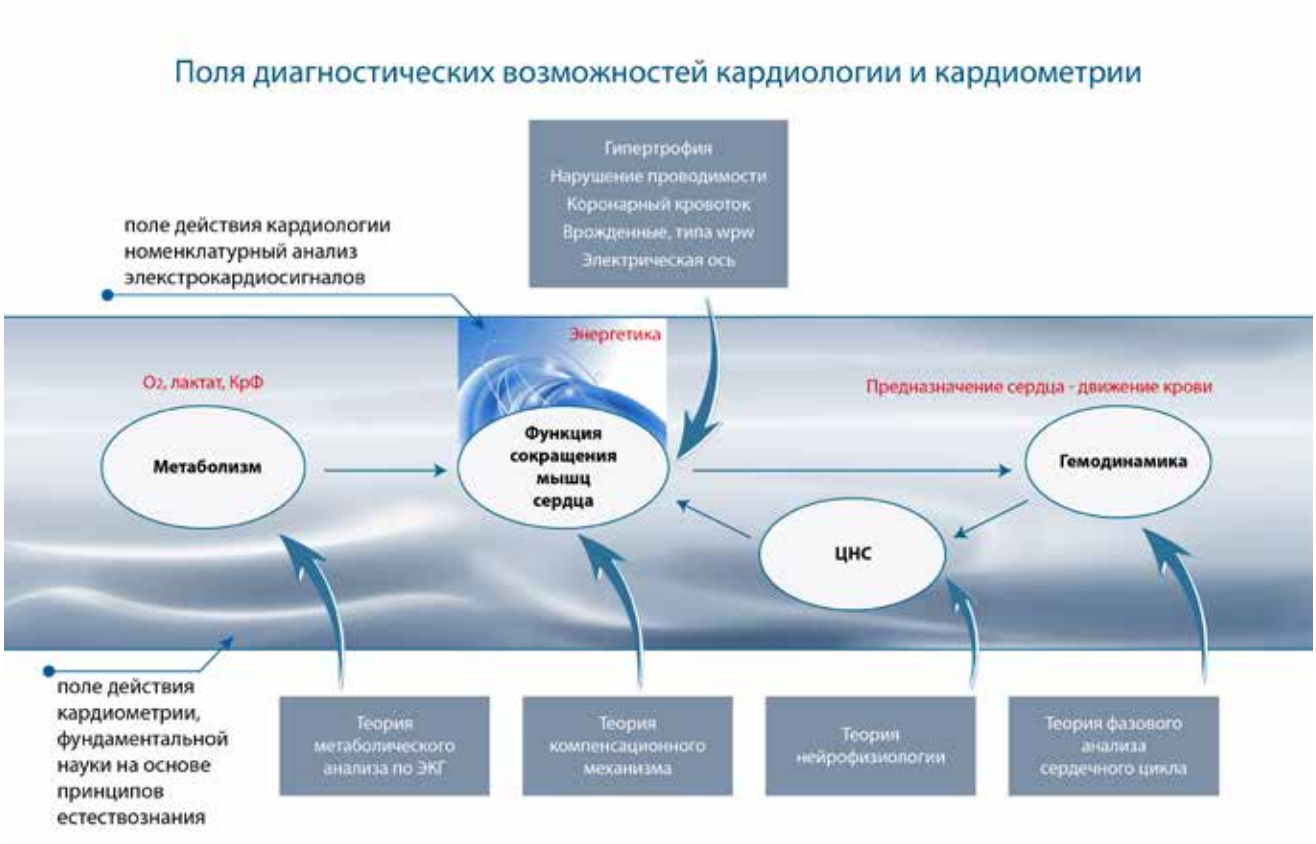

Fig. 131. Diagnostic capabilities of cardiology and cardiometry

following record: the block-out related to … (specify one of the diagnosable causes).

The contradictions are still present, but now the effective medical treatment is feasible.

2. WPW syndrome (12.1.3).

WPW syndrome is assessed from the cardiac muscles metabolism point of view. The normal range and measured quantities of the oxygen, lactate and creatinephosphate are specified. The method of metabolism correction is recommended. This philosophy is very effective.

3. S – T segment (12.1.4) and the ventricular hypertrophy (12.1.7).

The S – T segment (12.1.4) and the ventricular hypertrophy are assessed from the point of view of metabolism and processes corresponding to electromechanical linking. The lactate and creatine-phosphate contents are specified. These phases are very important and require sufficient metabolic energy consumption. They have an effect on the initial conditions of the blood energy at entering the aorta. This is represented on the RhEO in the form of the pressure rise in the rapid ejection phase (L – j).

In this segment, the stroke volume (SV) value (characterizing the ventricular hypertrophy) is estimated.

The segment levitation beyond the isoline denotes the compensation of the myocardium muscles weakness.

If the ECG form indicates the electromechanical interface segment depression (smoothing and onset in the lower portion of the S wave) that corresponds to the acute form of the infarction, the immediate measures must be taken.

4. Q wave and R wave development R (12.1.5).

P – Q is the most important phase, it shows the blood purity or the blood impurity of bacillary, virus, mycotic or parasitic nature. The actual state can be assessed only through the orthostatic test. The phase amplitude variation relative to isoline is the only criterion for assessment. The blood purity normalization removes most of the symptoms and first of all normalizes the arterial pressure.

The R wave bifurcation occurs only due to presence of congenital fistulas of coronary arteries. This abnormality is not dangerous, but the attention should be paid to physical load rate setting.

5. P wave (12.1.6).

When a number of P waves are represented on the ECG, the evaluation of the P wave can be correlated with the classical variant of the wave with

using the term "multifocal cardiosclerosis". The other variations of P wave shape can be compared with other manifested variations.

6. T wave (12.1.8)

It is not required to mention the relation with the myocardial infarction. The T wave shape is evaluated only when it is compared with other variations and symptoms. The T wave indicates the aorta dilatation when the patient takes the antihypertensive medication.

7. Others (12.1.11).

In all other cases, the ECG variation (or a number of interdependent variations) is (are) compared in a similar manner with the standard diagnose.