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EXTRASYSTOLE: ELECTROPHYSIOLOGICAL MECHANISMS, CAUSES, CLINICAL SIGNIFICANCE

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ANNOTATION

Extrasyistols (ES) are premature ectopic heart cuts. The pathological impulse leading to the extrasystole occurs at various levels.Atrial and atrial and ventricular extrasystoles are sometimes united under the name "Extrasyistols "due to their similar clinical value.

Keywords: Extrasystole,car dependent St, allorhythmia ,labile,wandering nerve, three-rich valve,Anisotropicre-entry,a heart attackmyocardial,, sinus knot.

Extrasyistols (ES)- Premature ectopic reductions in the heart. The pathological impulse leading to the extrasystole occurs at various levels. Depending on this allocateAtrial and atrial and ventricular extrasystoles are sometimes united under the name "Extrasyistols "due to their similar clinical value.

1.Atrial,

2. Conductors ("nodal", from the field of atreservant and ventricular compound)

3. Stomach extrasystoles.

The distance from the extrasystole to the previous complex is calledClutch interval.

If normal sinus cuts are combined in a certain sequence withэкстрасистоламиthat is called –allorhythmia (associated with rhythm)

There are three varieties allorhythmy:

- bigeminy-Extrasyistol after each normal reduction
- trigeminy-Extrasyistol after two normal abbreviations
- kvadrigeminy-Extrasyistol after three normal abbreviations

Extrasyistols are monotopic- when they come from one piece of heart, characterized by the same sections of the clutch and polytopic.

All ES vegetative genesis can be divided into three pathogenetic options:

1. Labile essee.
2. Stable Es rest.
3. ES voltage.

First Clinical Pathogenetic Option It is most common (in 47.5%) and is due to an increase in the activity of the vagauric nerve. More often found in children of the

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older age group. ES can be frequent, AllorhythmicGroup. There is a labile frequency of ES on the survey ECG For days.

Second Clinical Pathogenetic Option. It is mainly found in patients with a mixed form of the VDR The initial vegetative tone. Such ESs are listened and fixed on ECG regardless of the position of the body and physical exertion, that is, there is a stable preservation of frequent ES (usually allorhythmic), as well as during the day (sleep and active wakefulness).

Third Clinical Pathogenetic Option(ES voltage) -sympathicotonic. There is an increase in ES in Or the predominance of them during the period of active wakefulness and a decrease or complete disappearance at night. There is a freight or preservation of ES during exercise. Such ECs are fixed against the background of sinus tachycardia, more often found in the pubertal period.

Allocate the following development mechanisms extrasystoles:

1.**The phenomenon of the reciprocal of the excitation wave (re-entry)**It is based on most arrhythmias.Re-entryIt occurs at 3 conditions:

- the existence of two functional pathways of impulses having a common initial and endpoints;
- the presence of one-sided blockade of the pulse paths in one of two sites;
- Slowing the speed of the pulses along the closed chain.

Typical types of closed circuits of conducting in anatomical structures are known.

With Wolf Syndrome - Parkinson - White (WPW) This chain consists of atria, av compounds and a beam of histnia, ventricles and an additional beam between ventricles and atrials.

With some types of ventricular arrhythmia chainre-entryIncludes His beam legs in the field of a common proximal compound and a general distal connection in the myocardium of ventricles.

When atrial fluttering, the closed circuit of the pulses is created by circular myofibrils around the hole of the three-risk valve.

There are optionsre-entryIn functional structures.

Option "leading cycle"(characteristic of atrial flications): the excitation circulates around the central site being able Due to the constant flow of pulses from all sides of the closed chain. The length of the short path of the "drive cycle" can be 6-8 mm, and the closed part spreads the excitation into partly refractory tissues, which leads to the absence of an excitable gap. This kindre-entryCan change the size, shape and localization.**Anisotropicre-entry**The alisotropy of myocardium is due, where the speed of the propagation of pulses along is about 0.5 m / s, and across - 10 times less.

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Such typere-entryResolves for the occurrence of ventricular arrhythmias in the subacute phase of myocardial infarction. Phenomenonre-entryIt is based on most paroxysmal tachycardius.

The repeatability of this phenomenon is possible if the time progress of the chain pulsere-entry(cycle) more duration of refractory periods of all its links. Re-entry mechanismmaybeAs stimulated and interrupted by premature impulses, the role of which under the conditions of diagnostic studies perform electrical impulses, which is used as an essential diagnostic characteristic. Spontaneous developmentre-entryIt is often initiated by extrasystoles.

2.**Increase the amplitude of trace potentials**which remain after the previous excitement. These potentials cause re-premature myocardial cuts

3. **Unegraded depolarization of individual myocardial structures**. At the same time, the potential difference between cells in which depolarization has already ended and this leads to the appearance of extrasystole

4. **Increase the automatic cells of the conductive system**located below the sinus node. Most often registered with inflammation, hypoxia, sclerosis, electrolyte and metabolic disorders.

5. **Mechanismпарасистолии**. At the same time, an existence of an ectopic center in the atrias or ventricles is expected, which produces pulses with a certain frequency and periodically causes premature excitation of the heart.

Atrial extrasystoles

- **Upper atrial.**The path of passing the pulse in atriads is little different from the usual. Tusk p positive, sometimes there is its expansion and flattening.
- **Mid atrial.**The excitation simultaneously extends to the upper and middle atrial departments. This leads to the registration of a two-phase or smoothed teeth R.
- **Lover atrial.**The excitement applies to atria retrograde. What leads to the appearance of negative teeth R.

On ECG with in the extrasystolic cycleDistrictsomewhat deformed, the ventricular complex in typical cases is normal;The interval is equal ornot how muchexceeds the interval between sinus cycles. In early atrial extrasystoles, disturbances of the atrocadic (interval lengthening may occurPq)and(more often by type of incompleteor the full blockade of the right leg of the atrocadic beam) conductivity. Violation of the preservative conductivity in the extrasystole can be complete, then it is represented only by premature teethDistrict(blocked atrial extrasystole). ToothDistrictExtrasyistols can coincide with the teethTons of cycle, such a prongTons ofIt seems enlarged and slightly deformed compared to the teethTons ofin sinus cycles.

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Blocked atrial extrasystoles

Premature excitement arising in atrial rates can be blocked in an atrioventricular node and is not carried out on the ventricles. On the ECG, the absence of a QRS complex and T. T. Tusk R is deformed and can fit the previous reduction to the Tusk.

Extrasyistols from an atrioventricular connection.

Development options:

1. The pulse reaches the atria and ventricles at the same time, causing them synchronous abbreviation. The ECG complex QRS has not been changed. The peeper P is not registered separately, because merges with the QRS complex.
2. The excitement comes to the ventriclesearlier thanto atrium. On the ECG prong r negative, separate from the QRS complex
3. The excitation extends only to the ventricles due to the retrograde atrioventricular blockade.

Preservative Purpose Extrasyistols

Different pronounced deformation or inversion of a toothDistrictVetricular extrasystoles are represented by a deformed complexQrst,who does not precede the prog r. Various magnitude The interval ("compensatory pause") depends mainly on the moment of excitation of the sinus node in the extrasystolic cycle. Extrasyistols The sine knot is excited by retrograde The interval is approximately equal to the interval between two sinus abbreviations. The node can be somewhat increased if the retrograde pulse is slowed down.

Ventricular extrasyistols

The retrograde pulse on the sine unit, as a rule, is blocked, its own pulse in the sine node occurs in a timely manner and causes timely excitement of atrial. The activity of the sinus node is actually not disturbed, so the valueThe intervals are equal to the sum of the two intervals between sinus abbreviations.

With very early ventricular extrasystoles or extrasystoles against the background of bradycardia, another sinus pulse may occur after reffrag associated with the extrasystole, and cause timely normal reduction. Thus, the extrasystole is "clamped" between two timely sinus abbreviations -insert. Unusual increase The interval is sometimes associated with a decrease in the automatism of the sine node.

Especially unfavorablehemodynamicallyInefficient early ventricular extrasystoles arising simultaneously with the teethTons ofThe previous cycle ("R per t") or no later than 0.05 seconds after its end.

Sometimes it is possible a long rhythmic independent functioning of the ectopic focus along with a sinus rhythm driver, each of which is protected from the pulses of another – parasystolic. The pulses follow in the right (usually more rare) rhythm, independent of the sinus rhythm, but some of them coincides with the refractory period of the surrounding tissue and is not implemented,

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In some people, extrasystoles appear after the use of tea, coffee, alcohol, smoking, with excitement, receiving some drugs (for example, in patients with bronchial asthma after receiving or administration, Eufillin). These provoking factors can be detected as in the absence and availability of heart disease.

The emergence or increase in the extrasystole may coincide with the exacerbation of IBS, hypertension, myocarditis, etc. Frequent atrial extrasystoles often foreshadow atrial tachycardia or Atrial flicker. Stomach extrasystoles can serve as an early sign of intoxicating cardiac glycosides. Particular early early, as well аsполитопныеand group ventricular extrasystoles, which, with acute myocardial infarction and intoxication, cardiac glycosides may be precursor ventricular tachycardia or ventricular flicker. Frequent extrasystoles contribute to increased coronary insufficiency due to a certain reduction in the minute volume of the heart and the irrational consumption of energy. The clinical significance of the left estabot and the right-handed extrasystoles are actually the same, but the unit facilitates the diagnosis polytopic extrasystole, even if they are recorded in different leads

Paroxysmal tachycardia

Paroxysmal tachycardia - seizures of ectopic ventrycular (atrial, atrial stomach) or ventricular tachycardia, characterized by regular rhythm with a frequency of about 140 - 240 beats per minute, sudden start and sudden ending. The pathophysiological basis of the disease is in most cases the circulation of the pulse, less frequent - increase the automatism of the conductive systemdistal tosinus node. Accompanied by a violation of metabolism in myocardium.

Paroxism is usually felt patients as a healing attack with a distinct start and ending, duration of several seconds to several days. The attack may precede the emergence or participation in the extrasystole of the same level. During the attack at palpation, the pulse and auscultation detects frequent correct rhythm.

Supraventricular Especially atrial, tachycardia is often accompanied by various manifestations of vegetative dysfunction - sweating, abundant urination at the end of the attack, an increase in intestinal peristaltics, a small increase in body temperature. The prolonged attacks are accompanied by weakness, fainting, unpleasant sensations in the heart area, and in the presence of heart disease - angina, appearance or increase of heart failure. Carotid sinus massage with supraventricular Tachycardia sometimes allows you to immediately normalize rhythm, at least briefly

With ventricular tachycardia unlike supraventricular, carotid sinus massage and others Impacts do not affect rhythm. Vegetative signs are not typical. At the ECG supravetricular Tachycardia Rhythm frequent correct, unnecessary ventricular complexes are visible, in front of which at the atrial tachycardia can be distinguished slightly deformed toothR.ToothDistrictIt may be indistinguishable with atrocadic tachycardia. Atrial tachycardia is often accompanied by a violation of the atrocadic

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and (or) interventricular Conductures, more often on the right leg of the Gis beam. Violation of the atrocadic conductivity may be varying degrees, up to the full blockade.

With ventricular tachycardia, significantly deformed complexes are visible.Qrst.Atrium can be excited retrograde or independently of ventricles in the right rhythm, but the prongDistrictBasically, it is superimposed on the ventricular complexes and therefore it is not always distinguishable if the excitement that came from the atrium accidentally captures the ventricles or part of the ventricles after exiting the refractory state.

In most cases, paroxysmal supraventricular Tachycardia - manifestation of neurocirculatory dystonia, but they are found in any heart disease. Paroxysms are provoked by the load (emotional, physical), smoking, alcohol, hypoxy. Paroxysms of atrial tachycardia, especially in combination with the atrocadic blockade, can be a manifestation of intoxication with cardiac glycosides, a pronounced potassium deficiency. Paroxysmal Tachycardia is observed in the syndrome of the weakness of the sine node and the syndrome Volf- Parkinson - White.

Paroxysms of ventricular tachycardia are almost always associated with serious heart disease (acute myocardial infarction, heart aneurysm, myocarditis, severe vice, etc., Intoxication with heart glycosides) and are regarded as a threatening condition. They are heavier tolere patients than paroxysmal Tachycardia, more often lead to severe arterial hypotension, violation of blood supply to organs, the increase in myocardial ischemia and heart failure

Stomatricular tachycardia, especially with acute myocardial infarction, may be a harbinger of flickering of ventricles. Patients with The syndrome needs to observe and exclude myocardial infarction.

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