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ATRIOVENTRICULAR BLOCKS (CLASSIFICATION, DIAGNOSIS, EMERGENCY TREATMENT)

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Annotation: Various forms of atrioventricular blockades, their diagnosis, clinical symptoms are described. Modern methods of conservative therapy are presented. Indications and contraindications for implantation of ECS, resuscitation aids.

Key words: Arioventricular blockades; drug therapy; implantation of ECS; distal, proximal forms.

Atrioventricular block (AV block) is a manifestation of pathology at a certain level of the AV conduction system. The rationality of therapy and the prognosis of AV block depend on diagnostic verification of the level of AV conduction (distal lesions are prognostically less favorable).

I degree. Slowing of impulse conduction from the atria to the ventricles: prolongation of the PQ interval > 200 ms (0.2), the QRS complex is usually narrow, the ratio of P to QRS is 1:1.

II degree. Mobitz-1 type: progressive prolongation of the PQ interval with subsequent "loss" of the QRS complex (Samoilov-Wenckebach period), QRS complexes, P to QRS ratio > 1.

Mobitz type 2: "loss" of the QRS complex with a stable PQ interval, often narrow QRS complexes, the ratio of P and QRS > 1, maybe 2:1, 3:1, etc.

With AV blockade of the first degree and second degree of the first type, emergency measures are usually not required. For AV block of the second degree of the second type and complete AV block, the following measures are necessary:

1. elimination and treatment of possible causes (myocardial infarction (MI), drug overdose, electrolyte disorders);
2. intravenous administration of a 0.1 percent solution of atropine 1 ml per 10 ml of saline, which can eliminate disturbances in AV conduction caused by hypertonicity of the vagus nerve, but does not affect conduction at the level of the His-Purkinje system; AV block is recorded on the ECG with wide QRS complexes. The effect of atropine lasts about three hours;
3. Patients with second degree AV block of the second type and complete AV block at the level of the His-Purkinje system or accompanied by hemodynamic disturbances or syncope are indicated with temporary endocardial stimulation.

III degree. Complete AV block (atrial stimuli are not conducted to the ventricles), P and QRS waves are regular, there is a complete dissociation of excitation of the atria and ventricles. Not a single P wave is associated with the QRS complex; the P frequency is greater than the QRS frequency.

First degree AV block usually does not cause clinical symptoms.

II and III degree AV blocks are relatively rarely without clinical manifestations. They cause general weakness, shortness of breath, presyncope and fainting conditions.

Possible causes of AV block:

• increased tone n. vagus (these forms are characterized by a favorable prognosis, often asymptomatic, and registration of narrow QRS complexes on the ECG);

• primary diseases of the conduction system;
• myocardial lesions (MI, fibrosis, autoimmune inflammation, infiltration, storage diseases, etc.) with damage to the His-Purkinje system (frequent widening and deformation of QRS complexes, unfavorable prognosis);
• congenital blocks;
• drug effects (combination of drugs that inhibit AV conduction, β-blockers, AKs, cardiac glycosides, etc.)
Manifested by hemodynamic disturbances and fainting, dynamic observation is indicated.
If there is a rhythm with narrow QRS complexes on the ECG, narrow QRS complexes are observed in proximal AV blockades, which have a favorable prognosis.
It is necessary to discontinue medications that worsen AV conduction (antiarrhythmics, NSAIDs, steroid hormones, cardiac glycosides, etc.).
With blockades at the level of the AV junction, the prognosis is relatively favorable (narrow QRS complexes, escape rhythm frequency more than 4 per minute).
The more distal the blockade, the worse the prognosis. Persistent type 2 second-degree AV block and complete distal AV block increase mortality and usually require permanent IVR implantation, regardless of the presence or absence of symptoms.
PQ interval > 0.28 s is indicative of AV block at the level of the AV node, a PQ interval < 0.28 s is characteristic of AV block at the level of the inferior nodal AV conduction system. A QRS value > 0.12 s is characteristic of AV block at the level of the bundle branch system, < 0.12 s is indicative of localization of the block at the level of the AV node and the His bundle.
Tests with intravenous administration of atropine and physical exercise improve AV conduction when the block is localized at the level of the AV node and worsen when the block is localized at the level of the inferior nodal AV conduction system. Vagal tests worsen AV conduction when the pathology is localized at the level of the inferior nodal AV conduction system.
AV block of the second degree of the first type with Samoilov-Wenckebach periodicity. The cause is an increase in the tone of the vagus nerve, cardiosclerotic lesions of the conduction system of the heart and the toxic effect of drugs.
In case of acutely developed second degree AV block of the first type, it is necessary to exclude ACS with occlusion of the right coronary artery, the acute stage of lower MI.
Second degree AV block of the second type is a distal, prognostically unfavorable conduction disorder. This blockade, as a rule, is localized in the area of the bundle branches, less often - at the level of the trunk. QRS complexes are often wide, incomplete blockade of the right bundle branch.
When conduction pathology is localized at the level of the His bundle, the QRS complexes are narrow (QRS < 0.12 s), damage at the level of the His bundle branches leads to a widening of the QRS complex (≥ 0.12 s).
AV block of the second degree, type II (Mobitz-2). This is a distal, prognostically unfavorable conduction disorder -
The blockade, as a rule, is localized in the region of the His bundle branches; the QRS complexes are often wide and have the appearance of a RBB block. The reasons for the development of second degree AV block type II are often cardiosclerotic damage, occlusion of the left descending artery in the acute stage of MI.
Complete AV block (III degree AV block). The complete absence of impulse conduction from the atria to the ventricles compensates for this condition by slipping replacement rhythms.
• Wide QRS complexes are a sign of ventricular escape rhythm.
• The AV node is characterized by a frequency of 40–50 pulses per minute

Inferior IM. Complete AV block is usually transient; reperfusion therapy (thrombolytic administration, PCI) is required, which leads to conduction restoration. If conduction disturbances persist for more than seven days, the issue of implanting a permanent pacemaker should be considered.

Anterior MI is an unfavorable prognostic sign when complete AV block occurs, resulting from damage to the conduction system. Temporary endocardial stimulation is indicated.

Urgent Care

Elimination and treatment of possible causes (MI, drug overdose, electrolyte disorders).

Administration of a 0.1% solution of atropine 1 ml per 10 ml of saline solution intravenously. Usually, AV conduction disturbances caused by vagal hypertonicity can be corrected, but do not affect conduction at the level of the His Purkinje system. The effect of atropine lasts about three hours.

Patients with Frederick's syndrome - a combination of AV block with atrial fibrillation - atrial flutter (block at the level of the AV junction with narrow or wide QRS complexes), accompanied by hemodynamic disturbances or syncope, are shown temporary endocardial stimulation.

Treatment of atrioventricular blockades

I degree AV block usually does not require special treatment until the possible causes are clarified; dynamic observation with repeated ECG and CM registration is necessary to exclude higher degree AV blocks and possible cardiovascular diseases (rheumatism, myocarditis, etc.). with a functional nature - correction of the vegetative status: anticholinergics (atropine, Platy fillin), Corinfar (10 mg 3-4 times a day), Belloid (one tablet 3-4 times a day), Teopek (1/4 tablet 2- 3 times a day), isadrin (0.005 - sublingual).

AV block of the second degree, type Mobitz-1. Observation, re-registration of ECG and HM, correction of vegetative status: atropine, platyphylline, clonazepam.

In the acute occurrence of AV block with clinical manifestations and frequent loss of QR complexes.

• 0.5 ml of 0.1% atropine sulfate solution intravenously slowly; then 0.5–1.0 mg at 3-minute intervals up to a total dose of 2 mg (under monitor control) or 0.5–1.0 ml of a 0.1% solution of atropine sulfate subcutaneously 4–6 times a day;

• if ineffective - careful! — infusion of isoprenaline (Isadrina) at a rate of 0.5–5.0 mcg/min. under the control of a monitor (do not administer in case of acute MI!);

• if ineffective in acute anterior MI - temporary pacemaker.

2nd degree AV block type Mobitz-2, progressive AV block and 3rd degree AV block.

In case of AV block with wide QRS complexes (> 0.12 s) of the main or replacement rhythms - temporary endocardial pacemaker, treatment of the underlying disease. The effect is possible when taking sympathomimetics (from adrin), Corinfar, Belloid

For AV block with clinical manifestations, but with narrow QRS complexes (≤ 0.12 s), heart rate 40–60 beats per minute or pauses less than 3 s, the following are indicated:

• 0.5 ml of 0.1% atropine sulfate solution intravenously slowly; then 0.5–1 mg at 3-minute intervals for a total dose of 2 mg (under monitor control);

• if ineffective - careful! — infusion of isoprenaline (Isadrina) at a rate of 0.5–5.0 mcg/min. under the control of a monitor (do not administer in case of acute MI!);

• if ineffective - temporary endocardial pacemaker.

For acute onset of AV block with periods of asystole ≥ 3 s, Morgagni-Adams-Stokes attack and/or heart rate < 40 beats per minute:

• indirect cardiac masses and temporary endocardial pacemaker;

• 0.5 ml of 0.1% solution of atropine sulfate intravenously and 0.5–1. ml of 0.1% solution of adrenaline intravenously or intracardially;

• if ineffective, implantation of a permanent pacemaker.

Indications for permanent pacemaker implantation:

• Morgagni-Adams-Stokes attacks (even one in history);
• AV block of the third degree with heart rate < 40 beats per minute or pauses > 3 s;
• 2nd degree AV block of the Mobitz-2 type without clinical manifestations;
• AV block of the 2nd degree or 3rd degree, bifascicular block, alternating with complete AV block with clinical manifestations caused by bradycardia (dizziness, angina or ACS, progressive CHF, systolic hypertension);
• AV block of the second or third degree with rhythm disturbances requiring the prescription of antiarrhythmics, which is impossible if AV conduction disturbances persist;
• 2nd degree or 3rd degree AV block with wide QRS complexes (> 0.12 s);
• AV block of the first degree with an increase in the PQ(R) interval > 0.3 s.

Contraindications to permanent pacemaker implantation:

• AV block of the 1st degree and 2nd degree of the Mobitz-1 type without clinical manifestations;
• drug AV blockades, in which there is a high possibility of persistent regression of AV conduction disorders

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