

Vegetative resonance test is a tool for improving the quality of the anesthesiologist's work on the prevention of allergic reactions during anesthetic support operations

A.A. Azbarov, G.P. Basalkevich

(3 Central Military Clinical Hospital named after A.A. Vishnevsky, Krasnogorsk, Russia)

Anesthetic security operations is an complicated complex medical technologies, including the drug exposure of a significant number of drugs. These include anesthetics (general and local), analgesics (narcotic and non-narcotic), muscle relaxants, anticholinergics, ganglion blockers, sedatives, hormonal and desensitizing drugs, blood products, blood substitutes and other infusion drugs.

Allergic reactions pose a significant threat to the life and health of the patient during the operation. They affect the course of the postoperative period and contribute to the development of many complications. The likelihood of developing allergies during anesthesia is so great that all anesthesiologists must take this into account in their work.

Currently, allergic diseases are the third most common, and in some countries even come out on top. A fairly significant share of them is drug allergy. For example, if in the 60s, allergic complications of antibiotic therapy were observed in 1-9.5% of cases, then in the 80s they amounted to 50-69%. The likelihood of side effects of drugs in polychemotherapy is especially high, when the frequency of complications can reach 100% (Didkovsky et al., 1996).

Analysis of literature data on the prevalence of drug allergy shows that the epidemiological situation in our country is many times worse than abroad, and allergy ranks second after bronchial asthma.

Twenty years ago, up to 30% of inpatients had complications of drug therapy and in 71.05% of cases they were of an allergic nature.

Successful prevention of complications is an indicator of the quality of the work of a specialist in the field of anesthesiology and resuscitation. Currently, anesthesiologists provide prevention of drug allergy by collecting anamnesis in order to identify the facts of the use of various medications and the patient's response to them. In some cases, an allergist is consulted. Allergy skin testing (CAB) is a traditional and reliable method for diagnosing allergies. But this method has contraindications:

- exacerbation of the current allergic disease;
- acute infectious process (ARVI, tonsillitis, etc.);
- exacerbation of another chronic disease;
- serious condition of the patient;
- long-term therapy with hormonal drugs (corticosteroids);
- pregnancy.

Since the anesthesiologist has to act in all situations, these limitations significantly reduce the value of the method. In the literature, works continue to appear on not so rare cases of adverse reactions in patients with drug allergy to causative drugs used in the setting of skin, application and provocative tests up to anaphylactic shock with a fatal outcome [1].

In this regard, the problem of finding alternative reliable diagnostic methods is becoming more and more urgent. In addition, the diversity of allergic complications, the layering of toxic and other nonspecific manifestations require the development of a comprehensive specific diagnosis of drug intolerance, including both methods for assessing the patient's general immune status and methods of specific diagnostics [2].

Purpose of the research consisted in securing quality anesthetic protection of patients with a history of cases of the development of drug

allergies.

The objectives of the study were:

1. Definition of an index for the diagnosis of allergic stress.
2. Comparative assessment of the method of vegetative resonance test (ART) with the method setting of skin allergological tests.

#### Materials and methods

To achieve this goal, the capabilities of the ART method were used, which are implemented in the devices of the "IMEDIS" company. The study was conducted on 64 patients, of whom there were 46 women and 16 men. The average age was  $52 \pm 4.6$  years. All subjects were patients from various surgical departments. Each patient underwent a simple, blinded, one-step study. "Blinding" was achieved by the fact that the allergist who performed the skin allergy tests did not know the results of ART. The anesthesiologist who performed the ART study did not know the results of the allergist's work.

Patients with a history of drug allergy were selected for the study:

- in the form of anaphylactic shock in 15 patients;
- in the form of Quincke's edema in 49 patients.

All patients underwent operations with the participation of an anesthesiologist:

- hernioplasty - 12;
- laparoscopic cholecystectomy - 21;
- laparoscopic operations on the uterus and ovaries - 10;
- hemorrhoidectomy - 10;
- phlebectomy - 11.

The patients underwent various types of anesthesia, depending on the planned operation. The choice of drugs by the anesthesiologist was carried out on the basis of the data of the testing performed using the ART method. The list of anesthesia performed on patients in this study is given in Table. one.

Table 1

#### Anesthesia performed on patients included in the study

Type of anesthesia	Quantity
General anesthesia with mechanical ventilation	27
Subdural anesthesia	25
Combined anesthesia	12
TOTAL	64

In this study, the devices "MINI-EXPERT-DT" and "IMEDIS-BRT-PC" (drug selector) were used. The study was performed one day before surgery. Testing was carried out using the ART technology described in the guidelines of the Ministry of Health of the Russian Federation No. 99/96 of 2000 "Electropuncture vegetative resonance test" and the guidelines of the Center for Intelligent Medical Systems "IMEDIS" "Electropuncture diagnostics and therapy using vegetative resonance test" (edition 3 -e, 2000).

The testing methodology included the following stages:

1. Finding a reproducible measuring point.
2. Selection of an allergy indicator from the test preparations available in the selector.

Indication of allergy without autoaggression	HistaminumD60 ↓
Indication of food intolerance	Causticum Hahnem. D30 ↓
Indication of food allergy	Acidum formicicum D6 ↓
Indication of autoimmune (autoaggressive) processes	Allergie-injectopas. ↓

Further research used the pointer causing the largest decrease in the inflated value.

3. Testing of the drug to be used, with the ampoule with the drug placed on the test plate of the device.

Indication of the medication	Acidum formicicum D6 ↓ + Ampoule with medication ↑
------------------------------	--

Medicines planned to be used for premedication, during anesthesia and in the postoperative period were tested. A total of 20 different medications were tested. The result was considered positive if, when the drug was included in the circuit, the pumped value returned to the original 80 cu. scales. From this, the conclusion was drawn: the patient has an intolerance to the medication.

Evaluation of the suitability of ART as a method for diagnosing drug intolerance was carried out by comparing with the method of dermal allergological tests and the construction of a four-field table "Latin square" - tab. 5, as well as calculations of the operational characteristics of the test, in accordance with the requirements of evidence-based medicine. The data are presented in table. 6.

#### Research results

As a result of the study, the following results were obtained. The data of the study of the TI response in patients to ART indicators are given in Table. 2. The third column of the table shows the frequency of the largest decrease in the pumped value in absolute numbers, and the fourth - the percentage. Most often, the maximum decrease in the inflated value when one of the allergy indicators was turned on was when using Acidum formicicum D6 - 78.2% of cases.

table 2

Allergy Pointer Use Frequency

Pointer	A drug	Qty	%
Indication of allegria without autoaggression	Histaminum D60 ↓	2	3.1
Indication of food intolerance	Causticum Hahnem. D30 ↓	7	10.9
Indication of food allergy	Acidum formicicum D6 ↓	fifty	78.2
Indication of autoimmune (autoaggressive) processes	Allergie-injectopas. ↓	five	7.8
TOTAL		64	100

Table 3

Results of comparing the ART method with the method of skin allergy tests

ART	KAB result		Total
	Negative KAB	Positive KAB	
Intolerance missing	331	23	A + B = 354
Intolerance is present	97	829	C + D = 926
Total	A + C = 428	B + D = 852	N = 1280

Table 4

Operating characteristics of the diagnostic test

Characteristic	ART results
Sensitivity (Sn) = $D / (B + D)$ , %	$829 / (23 + 829) = 0.973 = 97.3\%$
Specificity (Sp) = $A / (A + C)$ , %	$331 / (331 + 97) = 0.773 = 77.3\%$
Positive predictive value = $D / (C + D)$ , %	$829 / (97 + 829) = 0.895 = 89.5\%$
Predictiveness of a negative result = $A / (A + IN)$ , %	$331 / (331 + 23) = 0.935 = 93.5\%$
Accuracy = $(A + D) / N$ , %	$(331 + 829) / 1280 = 0.906 = 90.6\%$
Likelihood ratio for positive results LRPTR = $Sn / (1 - Sp)$ ,	$0.973 / (1 - 0.773) = 4.29$
Likelihood ratio for negative results LRNTR = $Sp / (1 - Sn)$ ,	$0.773 / (1 - 0.973) = 28.63$

According to the research presented in table. 3, 4, the ART method has a high sensitivity up to 97.3%. And if the test has a high sensitivity, then its negative result can reliably exclude the alleged pathology [3]. At the same time, there is a fairly high specificity of the method, 77.3%, i.e. a positive result gives grounds for further differential diagnosis. The accuracy of the method is 90.6%, which allows you to fully trust the results obtained using the ART method. Likelihood ratio for positive

results (Likelihood Ratio for a Positive Test Result (LRPTR)) is the ratio of the probability to obtain a positive diagnostic test result in patients to the likelihood of obtaining a positive test result in healthy individuals. The likelihood ratio of a positive test result is 4.29. This means that the probability of a positive test in a patient is 4.29 times higher than the probability of a positive test in a healthy person. Finally, the likelihood ratio of a negative test result was 28.63. This means that the probability of a negative result in people with drug intolerance is 28.63 times less than in patients without such a pathology. Consequently, the autonomic resonance test allows the anesthesiologist to obtain reliable information about drugs that are safe for a particular patient. In this study, during anesthesia with drugs selected using ART, there was not a single incident associated with drug intolerance.

Thus, the autonomic resonance test technique increases the safety of anesthesia in patients with a history of drug allergy, which significantly improves the quality of the anesthesiologist's work.

#### Literature

1. Vasneva Zh.P., Balmasova I.P. / Introduction of new technologies into the process diagnostic examination of patients with drug allergy // Materials of the VI International Congress "Human Ecology and Health" 12-15 October 1999, Samara. - P.46-48.
2. Vasneva Zh.P., Balmasova I.P. / Development of methodological approaches to assessment the effect of drugs of the group of antihistamines and analgesics on the parameters of the peripheral blood immunity system of patients with drug allergy in vitro // Modeling in medical and biological research: Collection of scientific articles / Ed. prof. S.M. Babkina. - Samara; SamSMU, 1999. -- P. 33.
3. Vlasov V.V. An introduction to evidence-based medicine. - M. Media Sphere, 2001. -- S. 175-197.

---

A.A. Azbarov, G.P. Basalkevich Vegetative resonance test is a tool for improving the quality of the anesthesiologist's work on the prevention of allergic reactions during anesthetic support of operations // XII