The effectiveness of the use of electropuncture therapy apparatus "MINI-EXPERT-DT" as a technology for improving anesthetic management of coronary angiography

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Relevance

The importance of coronary heart disease in the structure of overall morbidity, as well as in the ranking of causes of disability and mortality, is extremely high. This emphasizes the importance of a clarifying diagnosis of its acute and chronic forms. In many situations, in order to ensure this level of diagnosis, it is necessary to carry out invasive endovascular intervention - coronary angiography.

As with most invasive diagnostic procedures, coronary angiography is fraught with operational stress. These include intraoperative pain syndrome, neurovegetative and psychoemotional imbalance. This circumstance is the rationale for the use of anti-stress measures in the form of anesthetic aid. However, the anesthetic provision of minimally invasive, outpatient and, which is especially important for the present work, diagnostic interventions, despite their apparent simplicity, is an unresolved applied clinical problem. In particular, it has not been resolved in relation to coronary angiography. In particular,

This method of anesthetic treatment cannot be a measure of a full-fledged anti-stress defense of the body, because does not relieve cardiac pain syndrome, does not prevent unwanted neurovegetative and psychoemotional reactions. The current state of the problem of optimizing anesthetic management in order to achieve full anti-stress protection in coronary angiography inevitably leads to the need for scientifically grounded development of specific programs for its solution.

In this sense, the concepts of multimodal and preventive analgesia with the use of non-steroidal anti-inflammatory compounds and "controlled" sedative drugs. In the long term, it should make it possible to prevent the perioperative development of the central and peripheral sensitization of the CNS structures and, thereby, to maximize the anti-stress protection of the body.

However, the use of the above drugs has a number of undesirable side effects and contraindications. So, for example, NSAIDs have an ulcerogenic effect, sharply increasing the acidity of the gastrointestinal tract, and tranquilizers cause depression of the central nervous system, death of neurons and form dependence, being psychoactive substances.

The analyzed data revealed the relevance of electromagnetic therapy carried out on the device "MINI-EXPERT-DT", which has the goal of reducing the dose of analgesic and sedative drugs and, possibly, partial rejection of them.

Target

Enhancement efficiency anti stress protection organism at implementation of endovascular diagnostics of coronary heart disease by optimizing the anesthetic treatment based on the prevention of painful and negative emotional reactions with the help of electropuncture therapy carried out using the MINI-EXPERT-DT apparatus.

Materials and methods

The objects of the study were 60 patients with a cardiac profile, who corresponded to the following patient model: “IHD, stable angina pectoris, FC III – IV, atherosclerosis of the coronary arteries, risk of CVC III – IV stage; age 50–70 years; without concomitant acute coronary syndrome, as well as other diseases comparable to the underlying disease or prevailing in its severity. " All patients in the preoperative period had II – IV degree of cardiological risk according to the classification of the All-Russian Scientific Society of Cardiology (2001) and I degree of anesthetic risk according to the classification of the Moscow Scientific Society of Anesthesiologists (1989), which corresponded to class 1 according to the ASA classification.

Inclusion criteria for the study: diagnosis of ischemic heart disease, stable angina pectoris, FC III-IV (according to the WHO classification, 2001); age 50–70 years; absence of transferred myocardial infarctions during the last 2 weeks; the degree of cardiological risk II-IV degree according to the classification of the All-Russian Scientific Society of Cardiology (2001); degree of anesthetic risk: class 1 according to the ASA system, degree 1 according to the classification of the Moscow Scientific Society of Anesthesiologists and Resuscitators. Exclusion criteria from the study: mismatch in any of the inclusion criteria; acute coronary syndrome; previous operation of coronary artery bypass grafting (due to technical difficulties of the operating manual); the presence of an artificial pacemaker; oncological diseases; the presence of concomitant pathology, comparable or prevalent underlying disease in severity; when assessing autonomic homeostasis - the presence of permanent forms of arrhythmias or paroxysms of arrhythmogenic activity at the time of the study; the presence of hypoergy (pronounced parasympathicotonia). All patients had hand-arm skin EAP measurement results before the intervention of 82–95 c.u.

The studied patient population was classified into 2 contrasting groups:

- group 1 - control, 30 people, using the traditional method of anesthetic provision in the form of only premedication and local infiltration anesthesia in the area of catheterization of the main artery;
- group 2 - main, 30 people, using the developed methodology

electrotherapy v addition To premedication and local infiltration anesthesia.

The study groups were standardized for all non-contrast characteristics. The basis for standardization was an identical intragroupdistribution of group members by functional classes of angina pectoris,age and gender, primary or recurrent nature of stenting, number of affected vessels, degree of coronary artery disease, types of atherosclerotic plaques, methods of premedication, surgery, local anesthesia and conservative treatment of coronary artery disease, carried out in accordance with the recommendations of the Ministry of Health of the Russian Federation.

All patients underwent premedication before surgery (ketorolac 30 mg (1 ml of official solution) + diphenhydramine 1% - 1 ml + phenazepam 0.1% - 1 ml per 30 minutes before the intervention). All patients underwent local infiltration anesthesia before catheterization of the main (femoral) artery.0.5% solution of novocaine in a volume of 20-30 ml. With an individualintolerance to novocaine, it was replaced by an equivalent volume 0.25% lidocaine solution.

The developed program of anti-stress electrotherapeutic treatment in addition to the standard anesthetic management inthe preoperative period is the following four consecutive stages.

Stage 1. For 7 days before the proposed invasive intervention in the evening hours (18.30–20.30), after a light meal, the patient visits the doctor (the doctor can carry out all the stages at the patient's home). The therapy is performed in a darkened room while sitting in a comfortable chair or recliner in a relaxed environment. Quiet sounding of soft, pleasant music is allowed. An active electrode (AE) and a passive electrode (PE) are connected to the MINI-EXPERT-DT device. AE is applied to the forehead, PE to the back of the head. Is selectedpositive unipolar pulse shape. The intensity is set to 20 units. These requirements are adhered to at all stages. Therapy beginsfrequency 3.6 Hz - 15 minutes, then set the frequency to 6.3 Hz - 15 minutes. ByAt the end, the patient is asked to walk around the room for 5 minutes. Next, therapy is carried out with a frequency3.6 Hz - 25 minutes, frequency 6.3 Hz - 25 minutes, after which the patient 5 minutes. resting while sitting (silently).

Stage 2. For 6 days before the proposed invasive intervention, electrotherapy with a frequency of 3.6 Hz - 30 min; then with a frequency of 6.3 Hz - 15 minutes. ByAt the end, the patient is offered to walk around the room for 5 minutes. Next, therapy is carried out with a frequency3.6 Hz - 15 min., Frequency 6.3 Hz - 30 min. Then the patientrests for 5 minutes.

Stage 3. For 4 days before the proposed intervention, electrotherapy with a frequency of 3.6 Hz - 15 min., Therapy with a frequency of 5.8 Hz - 10 min., Therapy with a frequency of 6.3 Hz - 15 min. Then the patient walksaround the room for 5 minutes, after which therapy with a frequency of 3.6 Hz - 10 min., 5.8 Hz - 15 min., 6.3 Hz - 20 min. Further the patient5 minutes. resting. The stage ends with the use of the frequency sweep mode, the so-called. "Swing", within 3 minutes. v

range "1" (1.00-10.00 Hz).

Stage 4. For 3 days before the proposed intervention (ie 1–2 days before hospitalization), frequency swing therapy begins for 3 minutes. in the range "1". Then therapy begins with the frequency3.6 Hz - 20 min., 5.8 Hz - 15 min., Frequency 6.3 Hz - 10 min. Further the patient5 minutes. walks around the room. The stage ends with therapy frequency3.6 Hz - 15 min., 5.8 Hz - 10 min., 6.3 Hz - 15 min., Then within 3 minutes the principle of "swing" is used, after which the patient rests for 5-10 minutes.

Criteria for the effectiveness of the electrotherapy program beforeanesthetic support were determined: the level of consciousness: moderate stunning - stupor (13-10 points on the Glasgow scale); no pain syndrome (i.e. ≤ 3 points on the VAS); lack of anxiety.

As a method of quantitative assessment of the intensity of painsyndrome, the mimic pain rating scale (MS), visualanalogue scale (VAS) and digital rating scale (DSC), officially recommended for use. For an express assessment of the functional status of the autonomic nervous system and the level of operational and anesthetic stress, we used the method of cardiointervalography followed by a mathematical analysis of the heart rate (MARS). Its results (distribution of RR heart rate intervals) were presented visually on the display of a personal computer in the form of a histogram and a table of results. The distribution of the durations of cardiointervals (histogram) was described by 4 parameters - mode (Mo) - the most frequent value of the duration of RR intervals (in seconds); mode amplitude (AMo) - the ratio of the number of modes to the total number of recorded cardiointervals (sample sizeN) (percentage);variation range (**-**X) - the difference between the maximum and minimum RR interval (in seconds); stress index (SI) - a calculated value (expressed in arbitrary units) - this is the most important indicator reflecting the regulatory activity of the autonomic nervous system.

Results and its discussion

When analyzing the results of the study, it was found that when performing coronary angiography during the intraoperative period, there are objectively four episodes that are critical for the development of two key factors of intraoperative stress. These episodes are the successive stages of puncture of the femoral artery, balloon dilatation of the coronary artery, performing coronary angiographic examination and the point in time fraught with the development of reperfusion syndrome. Typically, these episodes fall on the 5th, 15th, 20th and 30th minutes of the intraoperative period. These factors, in turn, are intraoperative pain syndrome and maladaptive activation of the autonomic nervous system by the type of hypersympathicotonia. In this case, it should be assumed that

Results of the study of the expression of intraoperative pain syndrome

showed that under the conditions of using the traditional method of anesthetic management, all patients at least 2 times (more precisely, from 2 to 4 times) during the intraoperative period experience severe pain syndrome; all representatives of the studied contingent of patients (100%) note pain syndrome at the stage of puncture of the femoral artery, almost ½ of the contingent (more precisely, 45%) experiences ischemic pain syndrome at the stages of dilatation and stenting of coronary arteries, and at least 15% of the contingent (which is also statistically significant) describe negative feelings associated with reperfusion syndrome; the intensity of the pain syndrome in this case reaches 4–7 points, which should be recognized, of course, unacceptable.

In turn, under the conditions of using the developed electrotherapy technique in addition to the standard anesthetic support, it was found that at least 50% of patients in the main group practically do not experience pain during the entire intraoperative period, including the identified "critical" episodes; the intensity of the pain syndrome is 0–2 points, which can be interpreted as its actual absence. In 40% of patients, the intensity of the pain syndrome was at the level of 3-5 points, only 10% were resistant to the proposed method, assessing the intensity of the pain syndrome at 6-7 points.

The results of the study of the intraoperative neurovegetative status showed that under the conditions of using the traditional method of anesthetic management: during the "critical" episodes of the intraoperative period, the level of stress-induced tension of the autonomic nervous system exceeds the permissible limit (equal to 150 cu) by 350–650% (!) (ie, 4.5–7.5 times); The "background" level of stress stress of the autonomic nervous system also exceeds the upper limit of the norm by 100-200%; during myocardial reperfusion, in a statistically significant percentage of cases, there are pronounced neurovegetative "shifts" (with ECG markers), as well as the associated "negative tolerance" by patients with reperfusion syndrome.

In turn, v conditions application developed an electrotherapeutic technique for the prevention of perioperative stress in addition to anesthetic support: during “critical” episodes of the intraoperative period, the level of stress-induced stress of the autonomic nervous system exceeds the permissible limit by only 45–65% (approximately 2 times); The "background" level of stress stress in two thirds of patients is within physiological values; during myocardial reperfusion, in all but two cases, painless tolerance of the reperfusion syndrome is noted, despite the presence of its ECG markers; the intergroup difference in the level of stress is 280-460% with a negative "preponderance" towards the traditional method. It should be noted that all presented and interpreted results have a high level of

statistical significance.

Thus, taking into account the empirically obtained evidence base, it can be stated that when using the traditional method of anesthetic management, there is an unacceptable level of pain syndrome, a pronounced stress-induced tension of the neurovegetative status at the level of sub- and decompensation and the resulting “complicated” course of the intraoperative period; when using the developed method of prophylactic electrotherapy, in addition to traditional anesthetic provision, there is a significant reduction or absence of pain syndrome, minimization of stress-induced tension of the neurovegetative status to the level of compensation and subcompensation and, accordingly, a fairly “smooth” course of the intraoperative period;

In conclusion, it should be noted that with a comprehensive analysis of the data obtained in the form of a decrease in the incidence and intensity of pain syndrome, as well as the achievement of stabilization of the neurovegetative status with high levels of statistical significance, it should be concluded that the developed technique is distinguished by a rather high efficiency of complex anti-stress protection of the body in coronary angiography.

Conclusions:

1. The developed program has pronounced stress-limiting properties in the situation of coronary angiography.

2. The developed program has a fairly high level effectiveness in preventing the development of pain syndrome, disorders of neurovegetative and psychoemotional status.

3. The level of total anti-stress efficiency developed the program exceeds that of the traditional program for endovascular diagnostic interventions for coronary pathology.

4. It makes sense to continue the search for new drug methods anesthetic benefits in addition to traditional premedication to eliminate pain, negative psychoemotional reactions and neurovegetative imbalance at the preoperative stage and during 4 episodes of the intraoperative period, critical for the development of key factors of operational stress. Electrotherapy using the device "MINI-EXPERT-DT" Center "IMEDIS", as an addition to the traditional methods of drug analgesia, has shown its consistency and the possibility of promising widespread use, due to ease of use, good patient tolerance, efficiency and availability.

Bibliography

1. Ivanov V.A., Movsesyants M.Yu., Trunin I.V. Intravascular methods

research in interventional cardiology. - M., 2008 .-- 212 p.

2. Savchenko A.P. Interventional cardiology: coronary angiography and stenting. - M., 2010 .-- 403 p.

3. Clinical anesthesiology: per. from English in 3 volumes / Ed. A.A. Bunyatyan. - Moscow: ZAO Publishing House BINOM, 2005. - 1064 p.

4. Nazarenko G.I. Interventional Medicine: A Guide for Physicians. - M .: Medicine, 2012 .-- 808 p.

5. Ovechkin A.M., Gnezdilov A.V., Yurasov A.V. Postoperative treatment pain relief - quality clinical practice. - M .: Medicine, 2003 .-- 213 p.

6. Samokhin A.V., Gotovsky Yu.V. Electro-acupuncture diagnostics and therapy according to R. Voll's method. –M .: IMEDIS, 2012. - 97 p., 109–119 p.

7. Voloshin T.G. Electropuncture diagnostics by the method of R. Voll. Technique measurement and interpretation of the measurement results of biologically active points. Drug testing and energy-information transfer. - M., 2009. - P.61–64.

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