The use of electroacupuncture vegetative resonance test (EP ART) to assess the functional state of the bronchopulmonary system in patients with chronic obstructive lung disease (COPD)

B.I. Islamov[1,2] A.A. Karpeev[1], M.V. Shilina[1], Yu.A. Dmitrieva[3], M.Yu. Gotovsky[4]
([1]Federal Scientific Clinical and Experimental Center for Traditional Methods of Diagnostics and Treatment of Roszdrav, Moscow, [2]Institute of Theoretical and Experimental Biophysics RA, Moscow, [3]City Clinical Hospital No. 63, Moscow, [4]Center for Intelligent Medical Systems "IMEDIS", Moscow)

SUMMARY

The possibilities of using the vegetative resonance test for assessing the state of the broncho-pulmonary system in comparison with spirography have been investigated. Were examined 102 patients with COPD in the acute phase, who were in hospital. The control group consisted of 21 healthy volunteers. The use of step-by-step statistical processing made it possible to single out the most significant ART EP tests for the diagnosis of COPD. They turned out to be organopreparations of the bronchi and lungs, morphological tests of the lungs and bronchi. A reliable cross-correlation was obtained between the spirography indices and the EP data of ART.

Key words: autonomic resonance test, ART, obstructive pulmonary disease, broncho-pulmonary system.

Chronic obstructive pulmonary disease remains one of the main problems of pulmonology [10, 11, 12, 14]. Its relevance is due to its high proportion in the structure of general morbidity, disability and mortality [6]. According to WHO forecasts, by 2020 mortality from COPD will take the 5th place among all causes of mortality [13].

COPD tends to get worse during the development of the disease [14, 15, 16]. Unfortunately, when using the "gold" standard for COPD diagnostics - spirography and peak flowmetry - it is not always possible to reliably track the deterioration of the patient's condition, which does not allow adjusting therapy based on the results of these methods. A number of researchers [4, 9] explain this by the fact that the indicators of these methods depend on the volitional effort developed by the patient during forced expiration, which can be reduced for reasons independent of the state of the respiratory tract, especially in seriously ill patients. In this regard, diagnostic methods are of interest to circumvent these technical difficulties. As such a method, we have chosen the method of electropuncture vegetative test (EP ART) [2, 3, 8]. Another reason for choosing this method is the lack of clear diagnostic criteria for COPD from the standpoint of EP ART, which complicates the implementation of the method into clinical practice. An analysis of the literature on the use of EP ART in pulmonology showed that the vast majority of studies were carried out with the aim of diagnosing and treating bronchial asthma [5].

Based on the above, we conducted a comparative study of the results of the study of patients with COPD by the EP ART method with the methods used in general therapeutic practice (amnestic, physical, functional, laboratory, radiological).

Materials and research methods

We examined 102 patients with COPD of varying severity in the acute phase, who were inpatient treatment. The control group consisted of 21 healthy volunteers, aged 36 to 41, non-smokers, without allergic diseases, without a history of risk factors for COPD, chronic processes in the nasopharynx, broncho-pulmonary and cardiovascular systems, without radiological changes in the chest organs. cells.

For the diagnosis of COPD, the International Classification of Diseases X revision (ICD-10), prepared by WHO (Geneva 1992), definitions of the All-Russian Research Institute of Pulmonology, WHO epidemiological criteria, data from the International Consensus and the Federal Program for the Diagnosis and Treatment of COPD were used. According to international recommendations, the stages of COPD were assessed depending on the level of forced expiratory volume reduction in 1 second (FEV1). Stage I COPD (mild) - FEV1

> 70% of the proper values were established in 21 patients; Stage II (middle) - 50–69% of FEV1 - in 40 patients; Stage III (severe) - <50% FEV1 - in 41 patients with COPD. The structure of the studied group is presented in table. 1.

During the study, we used: questioning, physical examination, assessed the results of a general blood test, chest X-ray examination, fibrobronchoscopy, EP ART.

Table 1

Genotypic and nosological characteristics of the group

Основная группа (n = 102)			Контрольная группа (n = 21)	
Степени тяжести ХОБЛ	Муж.	Жен.	Муж	Жен
1 ст.	11	10	12	9
2 ст.	17	23		
3 ст.	22	19		

The function of external respiration was investigated using a spirograph with computer processing "Spirotest" (Russia), with registration of lung volumes: VC (VC) - vital capacity of the lungs, FVC (FVC) - forced vital capacity, FEV1 (FVC 1.0) - forced expiratory volume in the first second; speed indicators: PIC (PEFR)- peak expiratory flow rate, MOC25 (FEF 25%), MOC50 (FEF 50%), MOC75 (FEF 75%) - the maximum volumetric flow rates of the curve at the points corresponding to 25%, 50%, 75% FVC; relative indicator: the ratio of the forced expiratory volume in the first second to the vital capacity of the lungs (FEV1 / VC)- Tiffeneau index.

A general blood test was performed according to the standard method. Bronchoscopy was performed using an Olympus 1T20 fiberoptic bronchoscope. X-ray examination of the chest organs was performed on a Renex-Fluro digital fluorograph (Gelpik, Russia). EP VRT was performed on an IMEDIS apparatus (Russia) with computer processing of the results in the IMEDIS-EXPERT program. The indicators determined by the EP ART method are presented in table. 2.

table 2

The minimum set of ART pointers test for determining the state of the lower respiratory tract

Название тест указателя		Краткая информация
Биологические Индексы (БИ), индекс 1-21	БИ общие (ОБИ1-ОБИ21)	Потенциированная соединительная ткань в потенциях от D2 до D36, что выражено в у.е. от 1 до 21 и отражает состояние внутренней регуляционной способности организма
	БИ бронхов,(БИбр1-БИбр21)	
	БИ легких (БИ л1-БИл21)	
Частные: органопрепараты		
Bronchi D3	Pulmo D3	Положительный тест свидетельствует о дегенеративных процессах в бронхолегочной системе разной степени выраженности
Bronchi D4	Pulmo D4	
Bronchi D5	Pulmo D5	
Bronchi D6	Pulmo D6	Положительный тест свидетельствует о том, что орган здоров, либо, что в органе есть участки здоровой ткани
Bronchi D10	Pulmo D 10	Положительный тест свидетельствует о подостром, вялотекущем процессе в органе
Bronchi D 12	Pulmo D 12	
Bronchi D15	Pulmo D 15	
Морфологические шкалы Л.Б. Махонькиной		
Воспаление	Острое	Соответствует морфологическим изменениям в органах, тестируется совместно с органопрепаратами легких, бронхов
	Хроническое 1	
	Хроническое 2	
Фиброз		
Склероз		
Норма		

The results obtained were subjected to statistical processing on a personal computer using the Statistica 6.0 program (Soft.Inc., 2001) [1]. For parameters described by normal distribution, the arithmetic mean (M) and standard error (m) were determined. In a pairwise comparison, the level

the significance of the differences was assessed by the parametric Student's test for independent samples. The study of the strength and directionality of relationships between variables was carried out using the Pearson's parametric correlation coefficient (Pearson r). When determining the correlations between nonparametric variables, the Spearman Rank R was calculated. The reliability of the differences in indicators determined by parametric and nonparametric methods was considered confirmed at p <0.05 (at t = 2, p> 95.5), the relationship of moderate strength was stated at r = 0.5–0.69, strong at r = 0.7-0.89). We also used multivariate factor analysis - principal component analysis with multivariate rotation.

Results and its discussion

Proceeding from the fact that we had to find the optimal set of tests for the diagnosis of COPD in EP ART, relying on the indicators used in pulmonology, we carried out a complex informational analysis by processing the obtained data using a statistical computer program. The process of searching for significant EP ART tests in the diagnosis of COPD included the following stages: input of clinical and instrumental, laboratory, information indicators, their transformation, analysis, presentation of results with their discussion. Arranging the set of studied factors according to homogeneity criteria into separate blocks is the first step. Based on the data obtained, a matrix was created that describes the blocks of anthropometric data, complaints, life history, medical history, objective status indicators, spirography data, laboratory, radiological indicators, fiberoptic bronchoscopy data, EP ART tests - a total of 77 signs for each patient. The original observation matrix is not given due to its large size (123 x 77). In it, the studied signs are indicated on an ordinal scale (1, 2, 3, ... .77), qualitative signs are defined by codes, quantitative ones are indicated in units of measurement.

The analysis of the results using correlation and factor analyzes made it possible, at the second step, to describe the causal relationships between the data set and to reduce the original matrix to 55 features, mainly due to a decrease in features in the block of anamnesis and ART tests. As you know, correlation analysis was a means of identifying dominant correlations and periodicities both in one process (autocorrelation) and between two processes (cross-correlation). When evaluating the results obtained, close correlations served as an indicator of cause-and-effect relationships, interactions within one process and between two processes. This publication presents the results of a statistical analysis of ART EP tests in comparison with spirography data.

In the group of patients with COPD, a significant cross-correlation of the volumetric parameters of spirography with the integrative parameters of EP ART was obtained. Namely, the relationship was registered between FEV1 and OBI (r = 0.67; p = 0.0023); FEV1 and RA (r = 0.64; p = 0.036), FVC and OBI (r = -0.58; p = 0.034), FVC and adaptation reserves (RA) with (r = 0.54; p = 0, 0037). As you know, these indicators of spirography are able to reflect both the state of the bronchopulmonary system and the general condition of the patient, his physical ability to perform the forced expiratory maneuver. And, consequently, the correlation with the tests of integrative indicators of ART EP in the main group, as a whole (without taking into account the severity of the process), seems to be explainable. Comparisons with the control group are also reliable. But after the patients were ranked according to the severity of the process, it turned out that that the correlation of the integrative test parameters with the 1st and 2nd stages of COPD is weak, and reliability was obtained only in patients with the third stage of COPD: OBI and FVC (r = 0.64; p = 0.0042), OBI and FEV1 (r = -0.73; p = 0.0032); FVC and RA (r = 0.52; p = 0.025), FEV1 and RA (r = 62, p = 0.038). The results obtained indicate that the integrative indicators of ART EP are not leading in the diagnosis of COPD and can only indirectly indicate a severe stage of COPD. Whereas private BIs (bronchi and lungs) showed a sufficient correlation with FEV1: bronchi (r = 0.60; p = 0.0023) and lungs (r = -0.56; p = 0.007), respectively. The BIL test correlated with such indicators of spirography as ROVid (r = -0.66; p = 0.007), FEV1 / VC (r = -0.56; p = 0.007), SOS OBI and FVC (r = 0.64; p = 0.0042), OBI and FEV1 (r = -0.73; p = 0.0032); FVC and RA (r = 0.52; p = 0.025), FEV1 and RA (r = 62, p = 0.038). The results obtained indicate that the integrative indicators of ART EP are not leading in the diagnosis of COPD and can only indirectly indicate a severe stage of COPD. Whereas private BIs (bronchi and lungs) showed a sufficient correlation with FEV1: bronchi (r = 0.60; p = 0.0023) and lungs (r = -0.56; p = 0.007), respectively. The BIL test correlated with such indicators of spirography as ROVid (r = -0.66; p = 0.007), FEV1 / VC (r = -0.56; p = 0.007), SOS OBI and FVC (r = 0.64; p = 0.0042), OBI and FEV1 (r = -0.73; p = 0.0032); FVC and RA (r = 0.52; p = 0.025), FEV1 and RA (r = 62, p = 0.038). The results obtained indicate that the integrative indicators of ART EP are not leading in the diagnosis of COPD and can only indirectly indicate a severe stage of COPD. Whereas private BIs (bronchi and lungs) showed a sufficient correlation with FEV1: bronchi (r = 0.60; p = 0.0023) and lungs (r = -0.56; p = 0.007), respectively. The BIL test correlated with such indicators of spirography as ROVid (r = -0.66; p = 0.007), FEV1 / VC (r = -0.56; p = 0.007), SOS that the integrative indicators of ART EP are not leading in the diagnosis of COPD and can only indirectly indicate a severe stage of COPD. Whereas private BIs (bronchi and lungs) showed a sufficient correlation with FEV1: bronchi (r = 0.60; p = 0.0023) and lungs (r = -0.56; p = 0.007), respectively. The BIL test correlated with such indicators of spirography as ROVid (r = -0.66; p = 0.007), FEV1 / VC (r = -0.56; p = 0.007), SOS that the integrative indicators of ART EP are not leading in the diagnosis of COPD and can only indirectly indicate a severe stage of COPD. Whereas private BIs (bronchi and lungs) showed a sufficient correlation with FEV1: bronchi (r = 0.60; p = 0.0023) and lungs (r = -0.56; p = 0.007), respectively. The BIL test correlated with such indicators of spirography as ROVid (r = -0.66; p = 0.007), FEV1 / VC (r = -0.56; p = 0.007), SOS_{25-75} (r = -0.62; p = 0.0008). The results of cross-correlation of the bronchial organopreparation and spirography data are given as an illustrative example in table. 3.

Table 3

Cross-correlations of bronchial organopreparation and spirography indices

Показатели	R	p-level
Органопрепарат бронхов & ЖЕЛ	**-0,568830**	**0,000841**
Органопрепарат бронхов & РОвд	-0,154913	0,405344
Органопрепарат бронхов & РОвыд	-0,574300	0,038036
Органопрепарат бронхов & ФЖЕЛ	-0,738296	0,000002
Органопрепарат бронхов & $ОФВ_1$	-0,712594	0,000010
Органопрепарат бронхов & $ОФВ_1$/ЖЕЛ	-0,677159	0,036476
Органопрепарат бронхов & $СОС_{25-75}$	-0,590569	0,036190
Органопрепарат бронхов & ПОС	**-0,561605**	**0,049594**
Органопрепарат бронхов & $МОС_{25}$	-0,339471	0,061715
Органопрепарат бронхов & $МОС_{50}$	**-0,681801**	**0,034052**

Significant indicators are highlighted in bold

To identify the latent factors that have the strongest effect on the electroacupuncture model for diagnosing COPD, and to assess the contribution of each factor to it separately, a factor analysis of the ART EP data was carried out using the method of isolating the main components. After the rotation of factors in space by the "varimax" method, variables were selected (ART-tests) with loads of 0.7 and more. This stage made it possible to determine the internal structure of each factor and its main components - predictors (Table 4).

Table 4

Eigenvalues of the identified factors in the group of COPD patients (Extraction method: method main components)

Показатели ЭП ВРТ	Факторы			
	1	2	3	4
РА	0,306	0,046	0,155	0,225
ОБИ	0,595	**-0,840**	0,155	0,168
БИл	0,617	**0,859**	0,106	0,420
БИбр	**0,766**	0,276	0,297	0,1531
Органопрепарат бронхов	**0,917**	0,472	0,514	0,536
Органопрепарат легких	**0,709**	0,553	0,608	0,579
Хроническое восполение бронхов	**0,891**	0,106	0,151	0,324
Хроническое восполение легких	**0,800**	0,321	0,109	0,315
Нормальное состояние бронхов	0,202	0,288	0,162	-0,281
Нормальное состояние легких	0,109	0,387	0,369	0,422
Склероз легких	0,156	0,118	**0,789**	0,018
Гистамин в бронхах	0,091	0,571	0,388	**0,831**
Острое воспаление бронхов	0,348	0,161	0,358	0,2081
Острое воспаление легких	0,650	0,468	0,093	0,416
Объяснимая дисперсия	9,357	4,868	4,271	3,727
Доля общей дисперсии	0,360	0,187	0,164	0,143

The cumulative percentage of the total variance of the four selected factors will be 85.4%, that is, it is this proportion of the observed phenomenon that can be explained by the influence of these factors. After rotation, the greatest variance was distinguished by factor 1 (S = 9.357 - 36% of the total variance), which combines the indices of tests organopreparations of the bronchi (r = 0.917), chronic inflammation of the bronchi (r = 0.891) and lungs (r = 0.800), BIbr (r = 0.776), lung organopreparation (r = 0.709). Factor 2, explaining 18.7% of the total variance (S = 4.868), combines the results of the ART tests BIL (r = 0.859) and OBI (r = -840).

The third place is taken by factor 3 (S = 4.271 - 16.4%). It consists of an indicator of pulmonary sclerosis (r = 0.789). The structure of factor 4 was unexpected (S = 3.727 - 14.3%), the main load in it is the histamine of the bronchi (r = 0.831). This indicator confidently correlated only with the data of the anamnesis; with objective and functional data, a sufficient correlation was not obtained. Many patients (64.2%) had a history of episodes of allergic rhinitis and conjunctivitis, a burdened family history of allergic diseases, there were no significant cross-correlations with spirography data. Thus, the main tests for the diagnosis of COPD are organ preparation of the bronchi (r = 0.917), chronic inflammation of the bronchi (r = 0.891) and lungs (r = 0.800), BIBR (r = 0.776), organ preparation of the lungs (r = 0.709).

conclusions

1. The use of step-by-step statistical processing made it possible to identify the most significant EP ART tests for the diagnosis of COPD,

2. The main test-preparations of EP ART are organopreparations of the bronchi and lungs, morphological tests of the lungs and bronchi.

3. A reliable cross-correlation was obtained between the spirography indices and the EP data of ART.

Literature

1. Borovikov V.P., Borovikov I.P. STATISTICA: statistical analysis and data processing in Windows environment. - M .: "Filin", 1997. - 276 p.

2. Vasilenko A.M., Meizerov E.E., Gotovsky Yu.V. Electro-acupuncture vegetative resonance test. Guidelines. No. 99/96. - M., 2000.

3. Gusev V.G. Informational properties of electrical parameters of the skin. - Ufa: Gilem, 1998 .-- 173 p.

4. Butler L.I. Exacerbation of chronic bronchitis. Diagnostic algorithm and therapy regimens // Infection and antimicrobial therapy. - 2001. - Vol. 3. No. 6. - P. 183-187.

5. Itsenko S.V. The state of bronchial patency and reactivity of the bronchi in complex treatment of children with bronchial asthma // Abstract of the thesis. dissertation. for a job. uch. step. Ph.D. - M., 2001.

6. Kokosov A.N. Chronic bronchitis and obstructive pulmonary disease: an analytical sketch // Ter.arch. - 2000; No. 3. - P. 75–77.

7. Makhonkina L.B., Sazonova I.M. Resonance test. Possibilities of diagnostics and therapy. Monograph. - Moscow: RUDN Publishing House, 2000 .-- 740 p.

8. Meizerov E.E., Gotovsky M.Yu., Katorgin V.S. Current state and development prospects methods of ART "IMEDIS-Test" and bioresonance therapy // Abstracts and reports of the XII International conference "Theoretical and clinical aspects of the use of bioresonance and multiresonance therapy." Part 1. - M .: IMEDIS, 2006. - S. 3–8.

9. Ovcharenko S.I., Leshchenko I.V. Modern problems of diagnosis of chronic obstructive lung disease // BC. - 2005. - Volume II, No. 4. - P. 28.

10. Sooronbaev T.M., Mirrahimov M.M. Diagnosis and treatment of chronic obstructive lung disease // Respiratory medicine. - 2007. - No. 1. - S. 24–28.

11. Chronic obstructive pulmonary disease. A practical guide for doctors. Federal program. 2nd ed. / Ed. acad. RAMS, prof. A.G. Chuchalin. - M., 2004 .-- 64 p.

12. Chuchalin A.G. Clinical guidelines. Chronic obstructive pulmonary disease. - 2007.

13. Shmelev E.I. Experience of using long-acting M-anticholinergic tiotropium bromide (spiriva) in patients with chronic obstructive pulmonary disease of the 3rd stage // Therapeutic archive. - 2005. - T. 77, No. 12. - P. 74–76.

14. Donaldson GC, Seemungal TAR, Bhowmik A., Wedzicha JA The relationship between exacerbation frequency and lung function decline in chronic obstructive pulmonary disease. // Thorax 2002; 57: 847–852.

15. Hoeper MM Observational trials in pulmonary arterial hypertension: low scientific evidence but high clinical value // Eur. Respir. J., March 1, 2007; 29 (3): 432-434. 16. Hoeper MM and Dinh-Xuan AT Pulmonary hypertension: basic concepts and practical management // Eur. Respir. J., February 1, 2008; 31 (2): 236-237.

Author's address
Dr. med. Islamov B.I.
FNCEC TMDL Roszdrav
islamov4@rambler.ru

The use of electropunctural vegetative resonance test (EP ART) to assess the functional state of the bronchopulmonary system in patients with chronic obstructive pulmonary disease (COPD) / B.I. Islamov, A.A. Karpeev, M.V. Shilina, Yu.A. Dmitrieva, M. Yu. Gotovsky // Traditional medicine. - 2009. - No. 2 (17). - S.42-46.