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THE NEW APPROACHES TO PROBLEM OF POLYMORBIDITY

СОВРЕМЕННЫЕ ПОДХОДЫ К ПРОБЛЕМЕ ПОЛИМОРБИДНОСТИ

Abstract

High prevalence of polymorbidity in outpatient therapeutic practice calls for improvement of diagnostic approaches, in particular, the development of methods for its measurement and using the results for optimization the number of medical, rehabilitation, expert and prevention processes.

The analysis of previously proposed methods of evaluation polymorbidity allowed to reveal the factors that hinder their using in domestic therapeutic outpatient practice.

Original methodology of integrated evaluation of polymorbidity adapted to the operating conditions of the district general practitioner and implemented its clinical testing.

The methodology of integrated evaluation of polymorbidity based on the principles of polyparametric analysis allows to stratify degree polymorbidity and significantly optimize the program of clinical supervision, treatment (including - assessing pharmacological load), prevention, rehabilitation, sanatorium selection, predicting the course and outcome of diseases, perform express-analysis of the degree of disability, cardiovascular risk in complex diagnostic and treatment interventions.

Keywords: polymorbidity, the methodology of integrated evaluation of polymorbidity, stratification, polymorbidity index, primary health care.

Аннотация

Высокая распространенность полиморбидности (П) в амбулаторной терапевтической практике требует совершенствования диагностических подходов, в частности – разработки методик ее измерения и использования результатов для оптимизации ряда лечебных, реабилитационных, экспертных и профилактических процессов.

Проведенный анализ ранее предложенных методик оценки П позволил раскрыть факторы, затрудняющие их применение в отечественной терапевтической амбулаторной практике.

Разработана оригинальная методика комплексной оценки П (МКОП), адаптированная к условиям работы участкового врача-терапевта и осуществлена ее клиническая апробация.

МКОП, основанная на принципах полипараметрического анализа, позволяет стратифицировать степень П и существенно оптимизировать программы диспансерного наблюдения, лечения (в т.ч. – оценки фармакологической нагрузки), профилактики, реабилитации, санаторно-курортного отбора, прогнозирования течения и исхода заболеваний, выполнять экспресс-анализ степени утраты трудоспособности, сердечно-сосудистого риска (ССР) при сложных лечебно-диагностических вмешательствах,

Ключевые слова: полиморбидность, методика комплексной оценки, стратификация, индекс полиморбидности, первичная медико-санитарная помощь.

Introduction. Polymorbidity (P) is a common phenomenon of outpatient practice. Most of the patients seeking primary health care (PHC) have multiple concomitant diseases [1, 2, 3]. At present in the conditions of development of evidence based medicine (EBM) measurement of P acquires increasing urgency. There are a number methods of its quantitative evaluation (CIRS, CIRS-G, indexes Kaplan-Feinstein, Charlson, ICED, GIC, FCI, TIBI, CDS, ACG, DUSOI) [4, 5, 6, 7, 8, 9, 10, 11], which were developed by foreign researchers. Meanwhile, a comparative analysis of the most common valuation methodologies P, revealed their common features such as narrow specialization, omni directional objectives and results, a limited number of indicators, often, low sensitivity [1, 4, 5]. They also do not contain recommendations for P stratification in the practice of doctor.

In this regard, at the moment, despite the existing methods, the practitioner meets with difficulties in conducting the complex evaluation of P, in particular, because of the lack of a unified, accepted, adapted for the practical application methodology [12].

The high prevalence of P in the practice outpatient care requires further improvement of working with patients of this group, in particular – development of a methodology to measure it, with subsequent using the results of developing in treatment programs, prevention, rehabilitation, working capacity expertise, sanatorium selection, forecasting risk assessments for surgical interventions and sophisticated diagnostic manipulations, etc.

The purpose of the study. Development of the methodology of integrated evaluation of P (MIEP) adapted for use in outpatient therapeutic practice and its clinical testing.

Materials and Methods. The basis of the MIEP are polyparametric analysis and EBM. Its implementation was simultaneous registration indicators, which were medical history, clinical, laboratory, instrumental, functional, psychological and social parameters of health. Individual elements of MIEP were constructed with using the above described foreign methods. Particular attention was paid to the account of risk factors of cardiovascular diseases (CVD RF), the number of nosologic units and the degree of functional violations of the organs and systems. Later the obtained data were entered to the database and expressed in points assigned depending on the quantity or qualitative indicator value in this patient. The final result of the study was calculated using mathematical methods, considered as an index of P (PI) and was expressed in arbitrary units. The histograms were constructed for representing a complex visual image of health and facilitating the analysis of P. This gives an opportunity for physician to assess a number and severity of chronic diseases and its contribution into polymorbidity status of the patient, as well as, the practical use of PI in algorithms of short-term and long-term outpatient work.

Clinical testing was conducted in Policlinic 7 of City Hospital 2 in Belgorod and have been intended for clinical evaluate of MIEP.

The work meets ethical principles and requirements defined current legislation RF, ICH-GCP Guidelines for conducting clinical trials from 01.05.1996 and the Declaration of Helsinki of the World Medical Association (version October 2000, as amended). All patients gave written consent to participate in the study, moreover, an opinion to the ethics committee was obtained.

In developing the methodology, data collection and processing materials used information technology applications the Microsoft Corporation Windows 7 OS.

Results and discussion. For the purpose of practical use and satisfy commonly accepted terminology in the methodology were integrated classification, medical and economic standards and current recommendations for diagnosis and treatment of cardiovascular diseases (CVD). Patient health indicators are divided into

clusters. The first cluster included non-modifiable indicators, the second - modifiable indicators, the third - the most common cardiovascular syndromes and nosological forms, the fourth - other diseases and the fifth - functional status. For convenience of practical use and interpretation results of the method depending on the cluster membership and order of numbers each indicator was assigned an identification code (IC). Evaluation of the data was carried out in the points assigned depending on the quantity or quality indicator values in the patient. Indicator values ranged from 0 to 6 points, and its increase in direct proportion to the pathological impact of individual indicator on health status and the patient's prognosis. The final result of the study was calculated using the formula 1 and considered as PI.

$$PI = \frac{100 - \sum_{i-1}^{55} x_i}{100} \quad (1)$$

PI can take values ranging from 0 to 1.0 cu. A value of 0 cu corresponded to P, incompatible with life; 1.0 cu - the absence of P. The values in the range 1,0-0,80 cu corresponded the low level of P, 0,79-0,50 cu – the average level of P and 0,49-0 cu – high level of P.

Subsequently, based on the obtained value of PI was performed express-analysis of the degree and duration of incapacity for work, the assessment of cardiovascular risk (CVR) in planned operational and sophisticated diagnostic interventions, the sanatorium selection, prediction of the disease course and outcome. Comparative analysis MIEP to previously proposed methods revealed a number of its advantages (Table 1).

Most demonstratively advantages of MKOP can be traced to clinical examples.

Clinical Example 1. Patient A.., 53 years old. Patient card number 23615. In accordance with the main known to date techniques, P in a given patient is tentatively estimated as low. Thus, the total score calculated by the system CIRS was 10 of 56 possible points, Kaplan-Feinstein index was 8 points out of a possible 36. In accordance with the main known to date techniques, P in a given patient is tentatively estimated as low. Thus, the total score calculated by the system CIRS was 10 of 56 possible points, Kaplan-Feinstein index was 8 points out of a possible 36. Charlson index allowed, In addition to evaluating P (2 points out of 40 possible in this patient that tentatively corresponded to the low level of P), to predict mortality was 26%. These methods did not provide further practical interpretation of the results. Meanwhile, obtained using MIEP PI was 0.86 cu, which corresponded to the low level of P. Analysis of histogram revealed pathological conditions, which have made the greatest contribution to the patient's A. polymorbidity status., and determined the presence of non-modifiable risk factors and changes in functional status.

'Thus, the level of of the patient A. P determined by methods CIRS, Kaplan-Feinstein, Charlson, and MIEP MIEP, evaluated as low. At the same time MIEP provided the physician more detailed information of the structure polymorbid status of the patient. The main contribution to this having made diseases of the nervous and digestive systems, diseases of the eyes and adnexa, musculoskeletal and urogenital system, there were moderate impairments in functional status due to dysfunction of the joints, there were no cardiovascular disease. Revealed violations in the cluster of modifiable health indicators were subsequently incorporated into the construction of treatment and prevention programs. There is reason to consider that the therapeutic and prophylactic medicamental and nonmedicamental measures holding in relation modifiable risk factors is definitely will reduce the level of polymorbidity, CVD RF, mortality and will improve prognosis of the patient.

Table 1

The comparative characteristic of most widespread methods of evaluation polymorbidity and the methodology of integrated evaluation of polymorbidity

Accounted parametres	CIRS	CIRS-G	Kaplan-Feinstein	Charl-son	ICED	MIEP
Age	–	+	–	+	–	+
Gender	–	–	–	–	–	+
CVD RF	–	–	–	–	–	+
Malignant neoplasms	-	+	+	–	+	+
Severity of nosological forms	+	+	+	–	+	+
Functional status	–	—	–	–	+	+
Prognosis	–	–	–	+	+	+
Stratification of degree patients P and efficiency of the measures in the dynamics	–	–	–	–	–	+
Adapting to the needs of PHC in the Russian Federation (planning of clinical supervision, examination of disability, risk assessment for complex diagnostic and treatment interventions, the sanatorium selection, etc.)	–	–	–	–	–	+
Total number of indicators	14	15	12	21	30	55

Legend: "+" – the account parameter is provided; "–" – not provided.

Clinical Example 2. Patient M., 61 years old. Patient card number 3381. In this case the use of previously proposed methods give controversialy result. Using the system CIRS P of this patient evaluated in 15 of the possible 56 points, Charlson index is 4 of 40 possible points, which tentatively corresponds to the low level of P. At the same time, Kaplan-Feinstein index was 13 of a possible 36 points, which tentatively corresponds to the average level of P. Mortality, according to an index Charlson, was 52%. PI calculated using MIEP was 0.73 cu, which corresponded to the average level of P. Histogram analysis showed that the patient's M. polymorbid status caused by mainly diseases of the peripheral vascula, nervous, musculoskeletal and endocrine systems, essential hypertension and also by age. Mainly due to chronic heart failure, disorders statodynamic function and functional capacity of the patient had significant violations of the functional status. Thus, this clinical examples show differences in the degree of P defined by methods CIRS, Kaplan-Feinstein, Charlson. Understatement of the patient P. M. defined using the system CIRS, compared with MIEP, due to lack of registration age in the first method, and using the index Charlson - limited set of nosology.

Clinical Example 3. Patient B., 74 years old. Patient card number 1754. According to the system CIRS P in this patient was 25 out of 56 possible points, while the index of Kaplan-Feinstein - 18 out of a possible 36 points, which tentatively corresponds to the average level. Charlson index was 11 of 40 possible points, which tentatively corresponds to the low level of P. At the same time PI equaled to 0.40 cu, which corresponded to a high level of P. Histogram analysis allowed to determine the structure polymorbid status of the patient. This clinical case most clearly demonstrates the diversity of evaluation P using several different methods

and possible underestimation of its degree, compared with MIEP, using methods CIRS, Kaplan-Feinstein and, in particular, – Charleson.

An example of the practical application of MIEP in PHC can be a assessment of CVR for planned surgery and sophisticated diagnostic manipulations. According MIEP the assessment of CVR carried out depending on SP. Were identified as follows ranges for the stratification degree of CVR: 0-0,80 cu – the risk of low-degree, 0,79-0,50 cu – average degree, 0,49-0,30 cu – high degree and ≤ 0,29 cu – extremely high degree. Accordingly, the patient's A. CVR was assessed as low, the patient M. - medium and patient B. – high. To predict the frequency of cardiac complications at surgery is currently the most widely used LeeIndex. Its value in the patient A. was 0 points (projected frequency of development of cardiac complications 0.4%) patient V. – 1 point (0.9%) and the patient B. – 2 points (7%). Clinical examples demonstrate conformity assessment results of CVR using MIEP and LeeIndex.

Thus, MIEP allows the stratification of degree P and use its results in the optimization of many both short-and long-term, clinical processes undertaken primarily in outpatient settings.

Conclusion. was developed jn the basis of the polyparametric analysis -and EBM, order to quantitatively evaluate P and optimization of various diagnostic and treatment processes, especially in terms PHC. The practical value of the method is the possibility of using its results for both short and long-term observation of patients: clinical examination, constructing treatment programs, prevention, rehabilitation, followed by an assessment of their efficiency over time, the rapid analysis of the degree of loss of disability evaluation CVR during planned surgery and sophisticated diagnostic manipulations, sanatorium selection. MIEP advantages is keeping the patient's age, sex, presence of malignant neoplasms, functional status. Development MIEP, made with regard to the principles of DM allowed, to a significant extent, to avoid a number of inconsistencies inherent in previously proposed methods. It is particularly characterized by unification, a wide range of tasks, higher sensitivity and the possibility of stratification degree of P. MKOP recommended for practical use in a wide network of outpatient medical organizations.

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