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Analysis of defects of treatment in hypertensive patients

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Abstract

Objective. To estimate the adherence and performance of health care standards (treatment and medicamental components) in patients with essential hypertension at different levels of medical care delivery. **Design and methods.** The analysis was carried out by evaluation of the ratio between actual implementation of medical procedures and prescriptions and the rate recommended by the standards according to primary medical documentation. Content analysis, analytical and statistical methods were applied. **Results.** Out of 46 (100%) medical parameters 67% were implemented in city hospitals, 70% — in the District Hospital, 87% — in regional and federal medical organizations with varying frequency. None of recommended medications was prescribed with a recommended frequency. **Conclusions.** Non-compliance with the standard recommendations for hypertensive patients is found at all levels of health care system, in particular, non-adherence with the prescription rate of recommended medications and frequency of medical procedures implementation.

Key words: medical care, standard, arterial hypertension

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Анализ дефектов лечения больных артериальной гипертензией

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Резюме

Цель работы — оценить степень выполнения лечебного и медикаментозного компонентов стандарта стационарной медицинской помощи больным эссенциальной артериальной гипертензией на разных этапах оказания медицинской помощи. **Материалы и методы.** Оценка степени выполнения лечебного и медикаментозного компонентов стандарта проводилась путем определения процента фактического применения лечебных процедур и назначения лекарственных препаратов от рекомендованной в стандарте кратности по данным первичной медицинской документации. В работе применялись методы: контент-анализа, аналитический, статистический. **Результаты.** Из 46 (100 %) параметров лечебного компонента с различной частотой назначения в городских больницах выполнялись 67 %, в районных больницах — 70 %, в областных и федеральных медицинских организациях — 87 %. Ни один лекарственный препарат медикаментозного компонента не применялся с рекомендованной кратностью применения. **Заключение.** На всех этапах оказания медицинской помощи выявлено несоблюдение рекомендованных стандартом кратности выполнения лечебных процедур и назначения медикаментозной терапии больным артериальной гипертензией.

Ключевые слова: медицинская помощь, стандарт, артериальная гипертензия

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Introduction

According to the Order of the Ministry of Healthcare of the Russian Federation dated 15 November 2012 № 918n «On approval of the provision of medical care to patients with cardiovascular disease»; medical care is provided based on the standards of care approved in accordance with established order [1]. Currently, specialized medical care to patients with essential hypertension in the stationary conditions is provided in accordance with the standard, approved by the Ministry of Healthcare and Social Development of the Russian Federation dated 13 June 2007 № 419, which is the same for all health care organizations.

Objective: to estimate the adherence and performance of stationary health care standards (treatment and medicamentous components) in patients with essential hypertension at different levels of medical care delivery.

Design and methods

Altogether 1.209 medical reports (f. 003/app.) of hypertensive patients, treated at the cardiological departments of medical institutions of different levels of subordination, were analyzed in this study: in the central district hospitals (CDH) — 406 medical reports, in urban hospitals — 396 medical reports, provincial and federal medical organizations — 407 medical reports. Random sampling was used to make up study population. The mean age of patients was 55.8 years. Among them 59% of patients — by ambulance service, and 21% of patients asked for medical aid themselves. The population includes 69% urban and 31% rural area residents; among them — 44% males and 56% females.

MS Excel software was used to workup medical reports, which included construction and analysis of frequency distributions of parameters. The presented sample size allows us to estimate the utmost (maximum) error of any calculated proportion within ± 2.5% for each of the three subsamples and within ± 1.4% for the whole sample [2].

We carried out a comparative assessment of the actual implementation of therapeutic and medicamentous components of the medical care standard, depending on the frequency of parameter application and the category of medical institution.

Appropriate proportion of the sample was applied when the performance of therapeutic and medicamentous components with a standard application frequency of 0.9 and below was estimated as 100%. The content analysis, statistical, mathematical, and analytical methods were applied.

Results

The therapeutic component of the standard includes 46 parameters. The performance of the parameters in the urban hospitals was 67%, in the CDH — 70%, and in the regional and federal medical institutions — 87% with varying frequency assignment. We found that 19 parameters (41%) with the recommended multiplicity were used to treat patients in the CDH, 22 parameters (48%) — in the urban hospitals and 24 (52%) parameters — in the regional and federal medical institutions. Also 14 (30%), 15 (32%) and 16 (35%) parameters were not performed in the CDH, urban hospitals and regional and federal medical institutions, respectively.

Moreover, 10 (20%), 6 (14%) and 5 (11%) parameters that did not match with recom-mendations were applied in the treatment at the CDH, urban hospitals and regional and federal medical institutions, respectively. Subcutaneous introduction of medicaments by cubital and other peripheral vein catheterization (the recommended multiplicity of using is 0.1) was much more often used in the CDH (it was applied in 252 and 246 patients, respectively, instead of recommended 41 patients).

The intravenous injection of medications (the recommended multiplicity of using is 0.5) was used in the regional and federal medical institutions in 69% of cases, in the CDH — in 165% (intravenous injections were administered in 130 and 335 patients, respectively, instead of recommended 203 and 204 patients) and in the city hospitals — in 175% of cases (the intravenous injections were administered in 346 patients instead of recommended 198 patients). The Holter monitoring (the recommended multiplicity of using is

Table 1

DIURETICS PRESCRIPTION IN VARIOUS SUBORDINATION LEVEL INSTITUTIONS (%)

Characteristic of diagnostic component standard	Health care provision frequency (%)			
	Standard (U)	In Central District Hospitals	In Urban Hospitals	In Regional and Federal medical Institutions
Medications for kidney and urinary tract disease treatment	0.3	316%	316%	238%
Diuretics	1.0	316%	316%	238%
Hydrochlorothiazide	0.6	97%	139%	139%
Indapamide	0.4	618%	596%	385%

Table 2

ANTIARRHYTHMIC DRUGS PRESCRIPTION IN VARIOUS SUBORDINATION LEVEL INSTITUTIONS (%)

Characteristic of diagnostic component standard	Health care provision frequency (%)			
	Standard (U)	In Central District Hospitals	In Urban Hospitals	In Regional and Federal medical Institutions
Antiarrhythmic drugs	0.4	85.5%	221%	188%
Atenolol	0.2	270%	743%	150%
Bisoprolol	0.4	63%	153%	387%
Carvedilol	0.4	3.4%	28%	6,8%

0.1) in the CDH was not applied, in the urban hospitals it was applied in 130 patients instead of recommended 40 cases, and in the regional and federal medical institutions in 227 patients instead of 41. Exercise therapy for hypertensive patients (the recommended multiplicity of application is 0.5) in urban hospitals was not prescribed, in the CDH it was prescribed only to one patient and in the regional and federal medical institutions — to 26 patients (instead of recommended 204).

The analyzed medicamentous component of the standard includes four groups of drugs: medications for the treatment of the kidney and urinary tract diseases, antiarrhythmic drugs, medications for the treatment of heart failure and antihypertensive drugs.

In all medical institutions, the medications for the treatment of kidney and urinary tract diseases were administered with exceeding the recommended multiplicity of 0.3 (Table 1). In the urban, regional and federal medical institutions, hydrochlorothiazide (the recommended multiplicity of using is 0.6) was administered 1.4 times more often: it was administered in 99 and 102 patients instead of 71 and 73 patients, respectively. Indapamide (the recommended multiplicity of using is 0.4) was prescribed 6 times more often than it is recommended in the CDH and urban hospitals and 4 times more often in the regional and federal medical institutions.

In the urban hospitals, regional and federal medical institutions antiarrhythmic drugs were administered to patients more often than the standard recommends, but in the CDH it was administered more rarely (Table 2). Atenolol (the recommended prescription rate is 0.2) use in the regional and federal medical institutions, CDH and urban hospitals was 1.5, 2.7 and 7.6 times more often, respectively, than it is recommended. Thus, in the regional and federal medical institutions this drug was prescribed to 44 patients instead of 29, in the CDH — to 79 patients instead of 29 and in the urban hospitals — to 212 patients instead of 28. Bisoprolol (the recommended rate is 0.4) was used in the CDH 1.5 times less often than the standard recommends, in the urban hospitals, regional and federal health care institutions — 1.5 times and 4.8 times more frequently, respectively. In the regional and

Table 3

ХАРАКТЕРИСТИКА НАЗНАЧЕНИЯ ПАЦИЕНТАМ СРЕДСТВ ДЛЯ ЛЕЧЕНИЯ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ В УЧРЕЖДЕНИЯХ РАЗЛИЧНОГО УРОВНЯ ПОДЧИНЕНИЯ (%)

Characteristic of diagnostic component standard	Health care provision frequency (%)			
	Standard (U)	In Central District Hospitals	In Urban Hospitals	In Regional and Federal medical Institutions
Drugs for the treatment of heart failure	0.4	257%	262%	224%
Captopril	0.4	1.7%	68.4%	35.8%
Perindopril	0.4	66.7%	21.0%	319%
Enalapril	0.2	1105%	1120%	410%
Lisinopril	0.2	58%	14%	3%

Table 4

ANTIHYPERTENSIVE DRUG PRESCRIPTION IN VARIOUS SUBORDINATION LEVEL INSTITUTIONS (%)

Characteristic of diagnostic component standard	Health care provision frequency (%)			
	Standard (U)	In Central District Hospitals	In Urban Hospitals	In Regional and Federal medical Institutions
Antihypertensive drugs	0.2	153%	372%	408%
Amlodipine	0.6	230%	447%	530%
Verapamil	0.4	31%	235%	34%
Moxonidine	0.1	14%	0.0%	0%
Betaxolol	0.3	9%	0.0%	255%

federal health care institutions, this drug was prescribed to 277 patients instead of 58, in the city hospitals — to 87 patients instead of 57 and in the CDH — to 37 patients instead of 58. Carvedilol (the recommended prescription multiplicity is 0.4) was used in the CDH in 3% of cases, in regional and federal medical institutions — in 7% and in the urban hospitals — in 28% of cases.

The medications for congestive heart failure treatment (the recommended multiplicity of administration is 0.4) were prescribed to patients 2.2–2.6 times more likely than it is recommended (Table 3). Captopril (the recommended multiplicity of prescription is 0.4) in the CDH, provincial and federal health care institutions was prescribed to 1 and 21 patients, respectively, instead of 58, in city hospitals — to 39 patients instead of 57. In the regional and federal medical institutions perindopril (the recommended multiplicity of administration is 0.4) was prescribed to patients 3.2 times more often, than the standard recommends. On the contrary, it was less frequently used than recommended in the CDH and urban hospitals. Enalapril was administered 4, 11 and 12 times more often than recommended (0.2 usage multiplicity) in the regional and federal medical centers, CDH and urban hospitals, respectively. Lisinopril (the recommended multiplicity of prescription is 0.2) was prescribed to 58% of patients in the CDH, to 14% — in the urban hospitals and to 3.4% of patients in the regional and federal medical centers.

The antihypertensive drug administration exceeded the recommended standard of multiplicity of 0.2 in all medical institutions: in the CDH — it was 1.5 times higher, in urban hospitals — 3.7 times higher and in the regional and federal medical institutions — 4 times higher (Table 4). Some antihypertensive drugs were administered more often. Thus, amlodipine (the recommended application multiplicity is 0.6) should have been administered to 73 patients in each medical institution, regardless of level of medical care provided, but in the CDH it was prescribed to 101 patients (230%), in the urban hospitals — to 191 (447%) and in the provincial and federal medical centers — to 233 patients (530%). Verapamil (the application multiplicity is 0.4) in the urban hospitals was prescribed to 67 patients instead of 28, in the regional and federal medical centers and CDB to 10 and 9 patients, respectively, instead of 29. In the urban hospitals, regional and federal medical centers moxonidine (the recommended multiplicity of prescription is 0.1) was not applied. Betaxolol (the recommended multiplicity of prescription is 0.3) was administered in regional and federal medical centers 2.5 times more often, in the CDH — elevenfold more rarely and in the urban hospitals it was not applied.

Discussion

Medical-economic standards in the system of obligatory medical insurance developed and approved by the Ministry of Health care of the Russian Federation in 2012–2013, within transition to the single-channel financing, have considered significant expansion of the list of laboratory and instrumental examinations and the list of drugs compared to the standards of 2007. Thus, the routine primary health care in outpatient clinics for patients with essential hypertension is provided in

accordance with the standard approved by the Order of the Ministry of Health care of the Russian Federation dated 9 November, 2012 № 708n "On approval of the primary health care standard in essential hypertension (hypertensive disease)" [3]. However, the health care in hospitals is still provided in accordance with the standards approved by the Ministry of Health care and Social Development of the Russian Federation dated 13 June 2007 № 419 "On approval of the standard of medical care for patients with essential arterial hypertension (when qualified aid is provided)". As we found earlier, there is a non-compliance with the recommended standard of diagnostic procedures multiplicity in hypertensive patients at different levels of medical care [4].

Many national scientists suggest that the existing standards recommend medical technology, which is applicable to the "average" patient and does not consider individual characteristics in the given patient. Therefore, the standard should be used with other evaluation criteria [5, 6]. These criteria include proven clinical recommendations. According to Y. M. Komarov, there are two approaches to develop standards: they can be either differentiated (as the health care institutions) or integrated. The national standard of quality of medical care should include the minimum acceptable level of medical care and should be approved in accordance with this level. Medical care provided everywhere, should be above of this level. It would not be promising to argue the optimal standard as it is not attainable to everyone [7]. Many authors (E. I. Baranov, A. O. Konradi, Y. V. Kotovskaya, Zh. D. Kobalava) indicate that the standards should correspond with the recommendations of the European Society of Hypertension (ESH) and the European Society of Cardiology (ESC) for hypertension [8–11].

Conclusion

Therefore, non-compliance with quality indicators at all levels of medical care was identified including medical procedure multiplicity recommended by the standards and drug therapy prescription to hypertensive patients. Therefore, the medical organizations should monitor the adequacy of the usage of medicamentous and instrumental health care resources, while the administrators of regional health care institutions should identify the reasons for non-compliance comply with health care standards.

Conflict of interest

Author declares no conflict of interest.

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