

COMPLIANCE WITH HYPERTENSION GUIDELINES IN GENERAL PRACTICE IN SLOVENIA

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ABSTRACT

Introduction Compliance with hypertension guidelines in clinical practice is generally poor, but there was no data about compliance with any guidelines in general practice in Slovenia.

Objective Our aim was to find out whether general practitioners in Slovenia managed their hypertensive patients according to the national guidelines, based on 1999 WHO/ISH guideline recommendations.

Method 42 family physicians registered all patients with the diagnosis of arterial hypertension among 300 consecutive regular office visits. We used data about blood pressure management from paper medical records.

Results We collected data from 2752 patients with hypertension; the mean age was 64.1 years (SD = 12.4 years, from 21 to 97 years). All elements of the minimal diagnostic program in the last five years were performed in 23.8% of the patients. In 1809 (65.7%) patients, whose cardiovascular risk was estimated, the minimal diagnostic program was performed more frequently ($p < 0.001$). Non-pharmacological measures were performed in 1210 (47.0%) patients. 2649 (97.6%) patients had drug therapy in accordance with the guidelines. Follow-up in accordance with the guidelines was performed in 1492 (55.3%) patients. Only 256 (9.3%) patients were managed completely according to the guidelines and only 347 (15.5%) of study population reached the target values of blood pressure.

Conclusion The impact of hypertension guidelines on patients' management in everyday primary care appears marginal. More emphasis should be placed on the efficient implementation of the guidelines.

Key words: quality of health care; family practice; hypertension; guidelines

INTRODUCTION

Arterial hypertension is one of the most frequent health problems in clinical practice. Almost half of the European population suffers from hypertension [1]. Prospective studies have clearly identified an increasing risk for cardiovascular disease, stroke and renal disease associated with progressive levels of both systolic and diastolic blood pressure [2, 3], but results of several randomized controlled trials [4, 5] and results of clinical trials made in general practice [6, 7] have shown that antihypertensive treatment reduces morbidity and mortality in hypertensive patients. In spite of the availability of International and National Guidelines on Management of Hypertension, a considerable gap exists between evidence-based guidelines and management of patients with arterial hypertension in practice [8-10]. The number of inadequately treated patients is high [11]. In a small Slovenian study, only 9% of all hypertensive patients managed in family practice achieved target blood pressure values equal to or less than 130/85 mm Hg [12].

Appropriate knowledge of guidelines and attitudes of physicians are prerequisites for better adherence to the guidelines [13]. For example, an important reason why physicians do not treat hypertension more aggressively is that they are willing to accept an elevated systolic blood pressure in their patients as an acceptable outcome [14]. Physicians may still encounter barriers that limit their ability to carry out the recommendations more efficiently [13]. These may stem from the guidelines, the environment or the patients themselves; the key external barriers to better implementation of the guidelines are lack of

time, prescription costs, and patients' non-compliance. Another important reason for poor hypertension control might arise from the physician-patient relationship and from inadequate patient involvement in management of his/her own chronic disease.

Many physicians use higher values than 140/90 mm Hg for the blood pressure threshold for the diagnosis of hypertension. It is the threshold recommended by the evidence-based guidelines [8]. Only 10 % of the patients with newly diagnosed arterial hypertension had complete clinical and laboratory evaluation according to the minimum work-up suggested by the guidelines [16] and many physicians did not intensify antihypertensive treatment in case of persistently high blood pressure readings [8, 17]. There are also patients with diagnosis of arterial hypertension who had no blood pressure measurements in the office within the previous year [18].

OBJECTIVE

Compliance with guidelines in clinical practice is generally poor. In Slovenia, we have only a small study about compliance with guidelines on heart failure in a community hospital [19], but we have no study about compliance with any national guidelines in primary care. We wanted to study the adherence to the national hypertension guidelines in general practitioners in Slovenia, because arterial hypertension is one of the most frequent health problems in general practice and we have national guidelines on hypertension, which were widely distributed to all general practitioners.

METHOD

Participants

We took a random sample of 50 family physicians from the list of the Slovene Family Medicine Society. They were chosen randomly from the register of the Slovenian Family Physicians' Society. 42 physicians were willing to participate in the study (the response rate was 84%). Each of the physicians had to register data on all the patients with the diagnosis of arterial hypertension (as defined in the patient's medical records) among 300 consecutive regular office visits.

We used an entry form containing questions on retrospective data about blood pressure readings, diagnostic and therapeutic procedures in hypertension and follow-up. We also collected data on blood pressure values; we used the average of the last two values of blood pressure readings from the medical records; to avoid possible bias, we excluded the value measured during the visit in which the physician collected the data on the participating patient.

As a reference standard, we used the Slovene national guidelines on hypertension, published in 2000 [20], based on 1999 WHO/ISH and JNC 6 guideline recommendations, which were in use in Slovenia during the period in which we studied the compliance with the guidelines. We also collected data about general characteristics of physicians, patients and organization of work.

We collected data on diagnostic procedures in hypertensive patients in accordance with the guidelines: family history, history of smoking, body mass index, peripheral pulses, eye ground examination, blood sugar, lipids, serum creatinine, urine examination, ECG and cardiovascular risk estimation. We expected that each diagnostic procedure from the guidelines had to be done at least once in the past five years.

According to the guidelines, we also expected that each patient with hypertension was given advice on nonpharmacological measures in hypertension: advice on salt reduction, reduction on alcohol consumption (if appropriate), stopping smoking (if appropriate), body mass reduction (if appropriate) and regular physical activity. For the compliance with nonpharmacological measures in hypertension, advice on all non-pharmacological measures must be written in a medical record at least once in the course of known diagnosis of hypertension.

According to the guidelines, six classes of antihypertensive drugs (beta blockers, ACE inhibitors, A2 antagonists, calcium channel blockers, diuretics, alpha blockers) should be chosen as the first line of treatment, but in the case of combination of three or more different kinds of antihypertensive drugs, one of them must be a diuretic. Compliance with guidelines meant that one of the six drug classes was used in monotherapy, in case of two drugs all combinations were possible and in a combined antihypertensive drug therapy with three or more different antihypertensive drugs one drug had to be a diuretic.

In the guidelines, there are also recommendations about the follow-up of hypertensive patients. The minimal number of visits to the surgery should be for patients with the reached blood pressure and with a small to medium cardiovascular risk twice a year and for other patients

(without reached target blood pressure values or with high cardiovascular risk) at least four times per year. We accepted these minimal standards for follow-up from the guidelines.

Complete clinical and laboratory evaluation according to the minimal diagnostic program (suggested by the guidelines), nonpharmacological measures in hypertension (salt and alcohol reduction, regular physical activity, weight reduction), pharmacological approach and follow-up in accordance with the guidelines was regarded as appropriate compliance with national guidelines for hypertension.

According to the national guidelines from 1999, the target blood pressure for patients younger than 65 years and patients with diabetes was less than 130/85 mm Hg and for patients whose age was 65 or older the target blood pressure was less than 140/90 mm Hg.

Statistical methods

SPSS statistical software (version 12.0) was used for all statistical analyses: methods of descriptive statistics for the description of samples and t-test for comparison between independent samples. The level of significance was $p < 0.05$. The study protocol was approved by the National Ethical Committee.

RESULTS

42 general practitioners collected data on 12596 regular consecutive office visits. Within these visits, 2752 (21.9%) visits were made by hypertensive patients. In the group of hypertensive patients there were more female than male patients (60.7% vs. 39.3%), the mean age was 64.1 years (SD = 12.4 years, from 21 to 97 years). 532 (19.3%) patients had diabetes mellitus and 881 (32%) patients had an established cardiovascular disease. 2713 (98.7%) of the study population were on drug therapy for hypertension. Complete diagnostic work-up in hypertension with cardiovascular risk estimation in the past five years was performed in 627 patients (22.8%), but clinical examination and all recommended laboratory tests and ECG without cardiovascular risk estimation were done in 654 (23.8%) patients. Table 1 presents numbers and percentages of patients with each individual diagnostic procedure done.

Cardiovascular risk was calculated in 1809 patients (65.7%). It was calculated significantly more frequently in the group of patients with all other diagnostic procedures done, recommended in hypertensive patients (96% vs. 56%, $p < 0.001$).

All recommended non-pharmacological measures were advised in 1210 patients (47.0%). Table 2 shows numbers and percentages of patients who got advice on each non-pharmacological measure. All the patients treated with antihypertensive drug in monotherapy (N=982, 35.9% of all patients) took a drug from one of the recommended drug classes. Out of 794 (28.6%) patients taking three or more different antihypertensive drugs, 691 (87.0%) had a diuretic among them. Drug treatment in accordance with the guidelines was given to 2649 (97.6%) out of all 2713 patients on drug treatment for hypertension.

The mean office visit rate in patients with blood pressure reading was 4.3 (from 0 to more than 8, SD 3.3). In Table 3, there are numbers and percentages of patients regarding the number of office visits per one year.

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TABLE 1. Numbers and percentages of patients with individual elements of diagnostic procedure performed (N=2752).

ТАБЕЛА 1. Број болесника са изведеним појединим елементима дијагностичког поступка (N=2752).

Element of diagnostic procedure Елемент дијагностичког поступка	Number Број	%
Family history Породична историја	1656	60.2
Smoking history Пушачка историја	2283	83.0
Body mass index Индекс телесне масе	2090	75.9
Peripheral pulses Периферни пулсеви	1609	58.5
Eye-ground examination Преглед очне позадине	1559	56.6
Blood sugar Шећер у крви	2592	94.2
Lipid profile Липидни профил	2492	90.6
Serum creatinine Креатинин у серуму	2257	82.0
Urine examination Преглед урина	1902	69.1
ECG ЕКГ	2453	89.1

TABLE 2. Numbers and percentages of patients who got advice for non-pharmacological measures in arterial hypertension.

ТАБЕЛА 2. Број болесника који су добијали савете за нефармаколошке мере у артеријској хипертензији.

Nonpharmacological measure Нефармаколошка мера	Number Број	%
Weight reduction (N=2006) Смањење тежине	1380	68.8
Alcohol intake reduction (N=806) Смањење уноса алкохола	385	47.8
Stopping smoking (N=582) Престанак пушења	273	46.9
Salt intake reduction (N=2643) Смањење уноса соли	1649	62.7
Regular physical activity (N=2615) Редовна физичка активност	1724	65.5

TABLE 3. Numbers and percentages of patients regarding the number of office visits with blood pressure readings in one year (N=2696).

ТАБЕЛА 3. Број болесника према броју посета амбуланти са мерењем крвног притиска у једној години (N=2696).

Number of visits Број посета	Number Број	%
0	160	5.9
1	213	7.9
2	383	14.2
3	448	16.6
4	455	16.9
5	314	11.6
6	290	10.8
7	132	4.9
8 or more / 8 или више	301	11.2

were only 65 (2.4%) patients who, according to the guidelines, needed at least two office visits in one year; all other hypertensive patients needed at least four office visits per year. Only 1492 (55.3%) of hypertensive patients had recommended frequency of office visits with blood pressure readings.

Only 256 (9.3%) patients had diagnostic procedure, therapeutic measures (non-pharmacological and pharmacological) and follow-up according to the guidelines. Table 4 shows numbers and percentages of patients for total procedure and each procedure separately, which are in accordance with the guidelines in hypertension.

The target blood pressure was reached in 347 (15.5%) out of 2530 patients for whom we had all the data necessary to estimate the target blood pressure. Table 5 shows numbers and percentages of patients with systolic, diastolic and both blood pressure readings at recommended levels.

DISCUSSION

As in previous studies, we found a wide gap between guidelines recommendations and daily clinical practice [8, 16-19]. Compliance with National guidelines on

TABLE 4. Numbers and percentages of patients with total procedure and individual elements of procedure in hypertension in accordance with the guidelines.

ТАБЕЛА 4. Број болесника са целокупним поступком и појединим елементима поступка у сагласности са смерницама за хипертензију.

Parameter Параметар	Number Број	%
Total procedure in accordance with the guidelines (N=2738) Целокупни поступак у сагласности са смерницама	256	9.3
Diagnostic procedure in accordance with the guidelines (N=2752) Дијагностички поступак у сагласности са смерницама	627	22.8
Therapeutic procedure in accordance with the guidelines (N=2581) Терапијски поступак у сагласности са смерницама	1163	45.1
Follow-up in accordance with the guidelines (N=2696) Контроле у сагласности са смерницама	1492	55.3

TABLE 5. Numbers and percentages of patients with systolic, diastolic and both blood pressure readings at recommended levels.

ТАБЕЛА 5. Број болесника према артеријском притиску у препорученим границама.

Parameter Параметар	Number Број	%
Systolic blood pressure at recommended levels (N=2471) Систолни крвни притисак у препорученим границама	487	19.7
Diastolic blood pressure at recommended levels (N=2478) Дијастолни крвни притисак у препорученим границама	1295	52.3
Systolic and diastolic blood pressure at recommended levels (N= 2530) Систолни и дијастолни крвни притисак у препорученим границама	347	15.5

hypertension in Slovenian general practitioners is poor; less than a quarter of hypertensive patients had diagnostic procedures performed in accordance with the guidelines, less than a half of hypertensive patients got appropriate advice on non-pharmacological measures, the combined drug therapy was sometimes not optimal, the minimal standards for follow-up were fulfilled by only a half of all the patients, and only a small proportion of treated hypertensive patients reached the target blood pressure levels.

We managed to collect data on a relatively large sample of family practice visitors and identified hypertensive patients among them. This allows us a good insight into the quality of family practice daily routines. This is also the first large study on quality of blood pressure management in family practice in our country, which allows us generalization related to the whole family practice population in Slovenia. The use of similar methodology as in many other studies allows for comparisons to international data [18, 21, 22].

Epidemiology and significance of hypertension in Slovenia

According to the prevalence of hypertension in Europe, where 44 % of adult population and 67 % of elderly people have hypertension [1] and according to the estimated prevalence of hypertension in Slovenia, which is 42 % [23], we found that only a half of the hypertensive patients visited their general practitioners.

Under-diagnosed or untreated arterial hypertension could be one of the causes for high cardiovascular mortality in Slovenia as well as in other countries [24]. Mortality due to cardiovascular diseases in Slovenia declined from 48 % in 1988 [25] to 38 % in 2003 [26], but it is still high and is the leading cause of mortality. Better recognition and treatment of hypertension and other risk factors for cardiovascular disease is necessary and a step to this aim could be the preventive program for reducing cardiovascular morbidity and mortality, organized at the primary level of health care (started in 2002 [27]), and treatment of risk factors and cardiovascular diseases according to the guidelines recommendations.

Discussion on our own results

Although the minimal diagnostic program in accordance with the guidelines was performed in less than a quarter of patients, our results are better than in a similar Italian study [16], in which in only 10 % of patients the minimal diagnostic program was performed. Some of the elements of the minimal diagnostic program, e.g. blood laboratory examinations and ECG, were performed in the majority of patients, but others, like history, clinical examinations with fundoscopy and urine examinations, were performed in only two thirds of the patients. Eye fundus examination was the least frequently performed element of the minimal diagnostic procedure, as in the study from Italy, where eye fundus examination was performed in only 19 % of the patients; ECG and blood tests were done in only half of the patients [16].

Majority of the primary care physicians in our country do not perform ophthalmoscopy by themselves and patients have to go to the ophthalmologist to perform the examination. Another, probably more important reason why physicians do not perform diagnostic procedures according to the guidelines is that they are not aware that total cardiovascular risk, which depends on the level of blood pressure, is the most important factor and the basis for further treatment [20]. Total cardiovascular risk depends on the level of blood pressure, other cardiovascular risk factors and target organ damage, and for their estimation we need at least the minimal diagnostic procedures in hypertension. Many physicians, who are not aware of this, treat their hypertensive patients on the basis of the blood pressure level only [10].

Diagnostic and therapeutic procedure and follow-up in accordance with the guidelines was found in less than 10% of all hypertensive general practice attenders in Slovenia. Treatment of hypertension, acknowledging only the level of blood pressure, without taking into account concomitant diseases, other risk factors, target organ damage and individual differences between patients, might be one of the reasons for poor results. Possible other reasons for low compliance with hypertensive guidelines could be an unacceptable level of knowledge on hypertension guidelines among family physicians [28], non-acceptance of guidelines recommendations and guidelines recommendations, which might not be appropriate for the use in everyday practice [9, 13, 14].

Comparison of our own results with the international literature and the situation in other countries

Physicians advised all recommended non-pharmacological measures to less than a half of all the hypertensive patients. The results are similar in Germany [29] and better than results from Hungary, which showed that only one quarter of hypertensive patients got all recommended non-pharmacological measures in hypertension [30].

A possible reason for a relatively small proportion of patients getting all the recommended non-pharmacological advice is that physicians, when giving advice on non-pharmacological measures in hypertension, do not write the advice in patients' medical records [31]. The same phenomenon was found in an epidemiological study of arterial hypertension in Slovenia in 1985, where the patients reported that they had got advice on non-pharmacological measures in much higher percentage than written in the medical records [32].

Most of the patients with diagnosis of arterial hypertension (98.7%) who attended general practice were treated with antihypertensive drugs and less than 2% of patients were treated only with non-pharmacological measures. The percentage of patients receiving pharmacological treatment for hypertension was 83.8% in Germany [29], 85% in Finland and Hungary [30, 33] and 90% in Greece [34].

Almost two thirds of the patients had combined anti-hypertensive therapy, most frequently a fixed combination of two different drugs. The proportion of patients on combined therapy is similar to other European countries

[29, 30, 33]. In case of three or more different classes of antihypertensive drugs, a diuretic was included in such a combination. Physicians often used fixed combinations including a diuretic. There are many fixed combinations including a diuretic registered in Slovenia and the use of fixed combinations simplify the treatment and improve patients' compliance with treatment [35] and also physicians' compliance with the guidelines.

The average rate of office visits with blood pressure readings was 4.3, but only a half of the patients had the minimal acceptable number of blood pressure readings (for the majority of the patients at least four in one year) in the surgery in one year. There were also hypertensive patients without blood pressure readings in the past year, but the proportion of them was smaller than in Italy (6% versus 17%), and also patients with probably unnecessary frequent readings of blood pressure in the surgery (11.2% of patients had more than eight blood pressure readings in the past year). In the group of patients having at least one blood pressure reading in the surgery in the past year, there were 77% of patients with at least three readings of blood pressure in the past year; the result is similar to the result of another study in which 70% of patients with at least one blood pressure control in a year had at least three blood pressure measurements in the same year [18].

A small proportion of patients (15.5%) had blood pressure level readings in accordance with the guidelines. The comparisons of our results with results of other studies on blood pressure control in primary care is difficult because of the differences in the methodology and the target blood pressure level estimated. Data from other studies, done in primary care in Europe show that between 8.6% (in Poland) [21] and 10% in Finland [36] to 55.6% (in Greece) [34] of primary care hypertensive attenders had their blood pressure lower than 140/90 mm Hg.

Limitations of the study

This study has some limitations. First of all, the findings are representative for the attenders of general practice in Slovenia, but not for the entire hypertensive population in our country. Another limitation is that we used paper medical records as a source of data. Paper medical records as a source of data have some advantages (it is ethically acceptable, cheap, retrospective methodology), but also some disadvantages. The most important disadvantage is that the quality of data documentation varies from physician to physician and that the quality of paper data is not always a faithful account of the quality of process of care (i.e. adherence to hypertension guidelines) [37].

CONCLUSION

The impact of hypertension guidelines on patients' management in everyday primary care appears to have marginal efficacy. Family physicians in Slovenia are either not aware of or do not practice calculation of total cardiovascular risk, which is the most important factor and the basis for decisions on future treatment of hypertension. Most of the Slovene hypertensive patients were treated with antihypertensive drugs, frequently in combina-

tions. The choice of medication is appropriate. Follow-up is insufficient and only a small proportion of patients reached the recommended target blood pressure values.

More emphasis should be placed on the uptake of guidelines using multifaceted strategies for guidelines implementation. Patients will have to be empowered to take more decisive role in blood pressure control.

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ПРИДРЖАВАЊЕ УПУТСТАВА ЗА ХИПЕРТЕНЗИЈУ У ОПШТОЈ ПРАКСИ У СЛОВЕНИЈИ

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КРАТАК САДРЖАЈ

Увод Усклађеност са упутствима за хипертензију је у клиничкој пракси у начелу лоша, али засад нема података о сагласности са било каквим упутствима у општој пракси у Словенији.

Циљ рада Циљ рада је био да се открије да ли лекари опште медицине у Словенији прегледају болеснике с хипертензијом у складу с националним упутствима, заснованим на упутствима Светске здравствене организације из 1999. године.

Метод рада Четрдесет два лекара опште медицине забележила су све болеснике са дијагнозом артеријске хипертензије између 300 узастопних посета у амбуланти. Употребљени су и подаци о мерењу крвног притиска из медицинске документације.

Резултати Сакупљени су подаци од 2.752 болесника с хипертензијом, који су у просеку били стари 64,1 годину (*SD* 12,4 године; 21-97 година). Сви елементи минималног дијагностичког програма у последњих пет година примењени су код 23,8% болесника. Код 1.809 болесника (65,7%) код којих је процењено да постоји кардиоваскуларни ризик минимални дијагностички програм је примењен чешће ($p < 0,001$). Нефармаколошке мере биле су примењене код 1.210 болесника (47,0%), док је 2.649 бо-

лесника (97,6%) лечено лековима у сагласности са упутствима. Контроле у сагласности са упутствима биле су изведене код 1.492 болесника (55,3%). Само 256 болесника (9,3%) било је прегледано потпуно у сагласности са упутствима, а само 347 испитаника (15,5%) достигло је циљне вредности крвног притиска. **Закључак** Утицај упутстава за хипертензију на преглед болесника у свакодневной примарној заштити чини се незнатним. Већу важност требало би придати ефикасној примени упутстава.

Кључне речи: квалитет здравствене заштите; општа пракса; хипертензија; упутства

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