FACTORS AFFECTING THE DEGREE OF ADHERENCE IN CHRONIC TREATMENT OF ARTERIAL HYPERTENSION IN CANTON SARAJEVO

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ABSTRACT

Adherence represents a multidimensional phenomenon that is extremely complex and under the influence of interaction of multiple sets of factors that are professionally known as “dimensions of adherence”. Adherence represents and extremely important and significant factor in the process of medical treatment; however, a complex method of determining the degree of adherence has resulted in an insufficient number of research studies. The majority of studies have taken place in the segment of identification of patient-related barriers, reasons for and factors of non-adherence. The results of research that will be presented below show a significant number of patient-affected factors causing non-adherence.

Key words: degree of adherence in chronic treatment of arterial hypertension, adherence at the JU DZ Canton Sarajevo, dimensions of adherence

1. INTRODUCTION

Arterial hypertension

Arterial hypertension represents the chief risk factor for chronic cardiovascular and cerebrovascular diseases, and a significant public health problem (1). Blood pressure causes around 50% of all cases of myocardial infarction and around 60% of all cerebrovascular insults. Key arterial hypertension factors are related to: hereditary and genetic factors, postnatal period, lifestyle factors, age and gender, diabetes, previous cardiovascular problem, hyperlipidemia.

Most commonly used drugs are as follows: Thiazide diuretics, Beta blockers, ACE inhibitors.

1 According to the World Health Organization, blood pressure is defined as increased if SBP is 140 mmHg (18.7 kPa) or higher, and /or the level of DBP is 90 mmHg (12.0 kPa) or higher, with repeated measurements.

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SAŽETAK

Saradljivost predstavlja višedimenzionalni fenomen koji je izuzetno složen i pod uticajem interakcije višestrukih faktora koji su profesionalno poznati kao “dimenzij saradljivosti”. Saradljivost predstavlja i iznimno važan i značajan faktor u procesu liječenja. Međutim, kompleksnost metoda određivanja stupnja saradljivosti rezultira u nedovoljnom broju istraživanja. Većina studija se provode u segmentu identifikacije prepreka koje postoje kod samih pacijenata vezanih uz razloge i faktore nepoštivanja saradljivosti. Rezultati istraživanja koji će biti predstavljeni u nastavku pokazuju značajan broj faktora vezanih za pacijenate kao uzrok nesaradljivosti.

Ključne riječi: stepen saradljivosti u tretmanu hronične arterijske hipertenzije, saradljivost u JU DZ Kanton Sarajevo, razmjere saradljivosti
Calcium Antagonists\(^5\) and other Antihypertensives. ACE inhibitors stand out as the most significant drugs used in the treatment of heart failure, and play a key role in the treatment of hypertension, while also having a pronounced cardioprotective, vasculoprotective and renoprotective effect. For many, the ACE inhibitor therapy represents first-choice drugs in the treatment of hypertension.

Adherence

The contemporary treatment process includes a number of factors affecting the treatment outcome, and its effectiveness. There is a number of key stages during a successful treatment, including certainly a successful diagnosing of the underlying causes, prescribing adequate therapy, proper use of the prescribed therapy, and monitoring its effectiveness. The use of therapy (by the patient) in compliance with the prescribed instructions constitutes a rather important aspect in the successful treatment process; however that aspect is not accorded sufficient attention, nor has it been sufficiently explored in BiH. Professional term for the proper use of prescribed therapy is adherence, which is defined as "the extent to which a patient’s behavior matches the prescriber’s advice". (2). Results of a number of worldwide studies conducted in both developed and underdeveloped countries have shown a low degree of adherence: China - 43%, Gambia - 27% patients with hypertension, USA - 51%, Australia - 43% patients with asthma, adherence to depression therapy ranges from 40% to 70%. Antiretroviral therapy used in the treatment of AIDS ranges from 37% to 83% depending on the medicine, patients with chronic diseases use from 50% to 60% drugs in the prescribed manner (3).

Non-adherence causes a number of direct and indirect negative effects, on micro\(^6\) as well as on macro levels\(^7\). According to the latest studies and estimates, a significant part of funding earmarked for the healthcare system of a country is spent to remedy the consequences of non-adherence (Canada – estimated costs range from 7 and 9 billion dollar per year). There is a growing trend of new drug development and methods of treatment in the world, while at the same time there is rather meager investment in the segment of increased effectiveness of the existing drugs, primarily by way of increasing the level of adherence. Creating an adequate system and plan to increase adherence could be viewed as a long-term investment (expected return through reduced costs caused by non-adherence), but it would also have a positive impact on the increased national healthcare report.

Methods and modes for measuring adherence

The key reason for the insufficiently investigated effect of adherence to medical treatment and the healthcare system as a whole is a problem concerning the measuring of efficiency of use of prescribed therapies, or the measuring of the degree of adherence. Currently available methods pertain to direct\(^8\) and indirect\(^9\) methods that are not sufficiently efficient, which is to say that the process of measuring the degree of adherence is an extremely complex and time-consuming process. Direct methods collect more relevant and precise data, however they entail significantly higher costs, require active patient involvement, with a possibility of result distortion by patients. Indirect methods are much cheaper and require lower patient involvement, but the aforementioned brings about a collection of data whose reliability may be questionable (4).

The use of modern technologies in the process of measuring the level of adherence (MEMS\(^10\)) increases the degree of reliability and the level of patient involvement, however the foregoing method is still not sufficiently present, primarily due to the large amount of the required funding. Technological advance will surely improve the

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5 Useful alternative if thiazide diuretics and beta blockers are contraindicated, if they are not tolerated, or are ineffective.
6 Missed opportunities to get health benefits, costs of productivity (personal and socio-economic burden).
7 Healthcare system expenses (treatment of disease and complications), costs for the society (reduced productivity).
8 Monitoring the use of therapy, measuring drug concentration and its blood or urine metabolite, determining the biological marker added to the drug formulation.
9 Patient communication, assessment of clinical response, taking stock of the used and remaining tablets from the drug packaging, determining the ratio of drug collection, collecting questionnaires, electronic monitoring of therapy.
10 Electronic monitoring of therapy - medication event monitoring system.
methods and modes for measuring adherence, primarily by way of combination (5, 6) of direct and indirect methods, which will cause an increase in the number of studies, but also in the degree of their reliability. The results of the hitherto conducted studies have presented abundant evidence that assists us in understanding the role and significance of adherence in a healthcare system, which entails increased interest in the development of new adherence measuring methods and techniques, all with the aim of obtaining as correct and reliable information as possible (7).

It is particularly important to stress patient behavior during the hitherto course of the study. Patients who do not use the prescribed therapy under physician’s instructions most often present their degree of adherence in a credible manner (8); however all patients who are non-adherent did not present their behavior in a similar manner (9). The aforementioned represents a challenge for the existing and new methods of measuring adherence, because no single method may completely eliminate the possibility of result distortion by patients, nor is it possible to define the non-adherent patients behavioral patterns.

Reasons for and factors of non-adherence

Adherence represents a multidimensional phenomenon that is extremely complex and under influence of interaction of multiple sets of factors that are professionally presented as “dimensions of adherence.” The majority of studies in the segment of identification of barriers, reasons and factors of non-adherence are patient-related. Thus, for instance, typical reasons for non-adherence are as follows (10): forgetfulness (30%), other priorities (16%), decision to skip a dose (11%), insufficient level of information (9%) and emotional factors (7%). It is important to stress that, in the framework of the same survey, 27% of the subjects did not identify the reason for their poor adherence. However, a significant number of factors, listed in the footnote11(11), that constitute reasons for non-adherence are not under patient’s control.

A total of 5 factors have been identified as belonging to the set of patient-related factors, pertaining to: social and economic factors12, factors related to healthcare providers and the healthcare system itself13, disease-related factors14, therapy-related factors15, patient-related factors16. The results of investigation of the previously presented factors of chronic treatment of arterial hypertension in Canton Sarajevo will be presented below.

2. METHODS AND STATISTICAL ANALYSIS

Collecting data pertaining to adherence in chronic treatment of arterial hypertension has been carried out by way of research conducted between March 2012 and January 2013. The research was conducted at the JU DZ of Canton Sarajevo, where an analysis of more than 5,000 medical records based on multiple criteria17 has identified 315 potential subjects, with whom interviews were conducted where information on the purpose and objective of research was presented. Out of the 315 potential subjects, 280 of them consented to participate in the research study, and were then divided in two identical groups under the criterion of the type of tool they were provided with in order to improve their adherence to therapy. The first group of subjects used alarm pill boxes18, and the other hypertension logbooks19. All subjects have given their written consent, and

12 Poverty, illiteracy, dysfunctional family or cultural differences, age etc.
13 Poorly developed health protection system, insufficient drug distribution system, insufficient healthcare provider knowledge or training etc.
14 Symptoms of disease, patient incapacitation level, progression rate etc.
15 Therapeutic regime complexity, treatment duration, failure of previous therapy etc.
16 Forgetfulness, psychological stress, concern about possible side effects, low motivation, insufficient information etc.
17 Age group of 35 to 65 years, the subject has been using ACE inhibitor for at least 6 months, the medicine has not changed over the past 6 months, reported insufficient adherence to treatment – irregular or belated visits, irregular collection of medicines.
18 Alarm pill boxes – subjects contacted twice a month, or 12 times over a period of 6 months.
19 Hypertension logbooks – subjects contacted 2 times in the course of research study – after 3 and 6 months.
a single database has been created\textsuperscript{20}, with clear research criteria defined\textsuperscript{21}, while the survey consisted of 11 segments\textsuperscript{22}. The investigation was an open, longitudinal, multicentric, comparatively randomized clinical study, with two groups, with the use of standard statistical data processing methods\textsuperscript{23}.

The study covered a much broader aspect, which is to say that the factors affecting the degree of adherence to chronic treatment of arterial hypertension in Canton Sarajevo represent part of the research study\textsuperscript{24} whose results will be presented below.

3. RESULTS

Based on the collected data, the subjects’ socio-demographic status was as follows: Study group (S) – total number of subjects was 140, aged 54 (± 8), with predominantly female subjects (77%), and more than a half of the subjects employed (62%), while 21.4% of the subjects had college or university degrees. Control group (C) – total number of subjects was 140, aged 56 (± 7), male patients share was (28.5%), with significantly lower number of employed subjects (28%, 51% pensioners), and roughly equal academic structure (college or university degree – 20.7%). There was roughly the same number of married subjects in both groups (S – 77%, C – 75%).

The results indicate there is a small number of subjects (1/3) who regularly do some sort of exercise, more than 1/3 of the subjects smoke, and 29% never miss a dose\textsuperscript{25}. More than half of the subjects (51.4%) never forget to take their medicine with them while leaving home or traveling, 34.6% do not have any problem in remembering to take their dose, and most of them (56.4%) never discontinued therapy on their own. These survey results do not reflect the fact that the criterion of inclusion was that the subjects are not adherent to the therapy they use, which means we can state that patients are not sufficiently self-critical in assessing their adherence.

From the aspect of therapeutic efficiency, 77.5% of the patients are satisfied\textsuperscript{26} with the way the therapy affects their increased blood pressure (S – 70%, C – 80%), 73.2% of the subjects are satisfied with the time the drug needs to kick in (S – 71.4%, C – 75%), while 74.6% of the patients believe the therapy is easy to use (S – 70.7%, C – 78.6%). The subjects believe they were well or very well informed as to what to expect of antihypertensive therapy (C – 57.1%, S – 42.1%)\textsuperscript{27}. Most of the subjects have been informed by the physician about possible therapeutic complications (C – 51.4%), (S – 39.3%). Most of the subjects claim they were involved in deciding on medicinal treatment (C – 46.4%, S – 27.1%)\textsuperscript{28}, which means that their physicians have advised them to pay regular follow-up visits (S – 75.5%, C – 82.9%).

A significant statistical difference has been observed between the subjects who are employed, as well as the type of job they do. The number of non-adherent patients among pensioners was statistically significant, while subjects working in households were less adherent than those working in factories. No significant statistical departure was observed among other demographic variables (gender, marital status, level of education etc.) during both observed periods (3 and 6 months).

\textsuperscript{20} Ethical aspects complied with, coding and personal data protection completed, access to database limited to a small number of persons.

\textsuperscript{21} Levels of arterial blood pressure above 140/90 mmHg, the subject has been suffering from arterial hypertension for a minimum of 6 months, has been using ACE inhibitor regularly for more than 6 months, the subject does not have a malignant disease or serious mental disease.

\textsuperscript{22} A total of 60 questions of the closed-ended type, and 2 questions of open-ended type.

\textsuperscript{23} Arithmetic mean, median, interquartile range, absolute frequencies, relative frequencies, random sorting algorithm, Pearson’s $\chi^2$-test or Fisher’s exact probability test, Chi-square test ($X^2$-test).

\textsuperscript{24} Results of the entire study are presented in the doctoral dissertation: „Evaluation of adherence factors in chronic treatment of arterial hypertension”, by Mr. Sc. Ph. Lana Lekić, Faculty of Pharmacy, University of Tuzla.

\textsuperscript{25} A total of 26% of the subjects skip a dose very rarely, while a mere 39% of the subjects admitted to skipping a dose sometimes, or often.

\textsuperscript{26} Cronbach a coefficient of reliability is 0.989.

\textsuperscript{27} Cronbach a coefficient of reliability is 0.906.

\textsuperscript{28} It is important to note that a significant number of subjects who used alarm pill boxes did not respond to the question (S – 14.3%, C – 2.9%), which means that the elimination of the subjects who did not respond results in the absence of a statistically significant difference between the groups.
It has not been observed that the duration of hypertension, or the duration of therapy, affected adherence in any of the groups. It has been established that patients who take 3 or more medicines are significantly less adherent than those who take 2 or fewer medicines besides the prescribed antihypertensive therapy; however no significant difference was observed in terms of adherence between patients who were concomitantly taking 2 in relation to 1 or no drugs at all.

Statistical analyses of the collected data (baseline, after three months and after six months) for the study group, related to SBP and DBP, point to the fact that the therapy used by the subjects was effective. The same results were obtained for the control group (SBP and DBP). The value of SBP differences between the initial measuring and measuring after three months and after six months is statistically significant to the benefit of the subjects who used alarm pill boxes.

From the aspect of non-adherence, there were subjects in the study group who during a period of 3 months did not take the medicine for 12 days (4 to 5 days on average), or 25 days (11 days on average) over a period of 6 months, and in the control group there were subjects who over a period of 3 months did not take the drug for 75 days (16 days on average), or during a period of 6 months they did not take it for 95 days (36 days on average). There is a statistically significant difference in blood pressure levels between adherent and non-adherent patients who used the hypertension logbook. No such comparison was possible for the group of patients who used alarm pill boxes because all patients from this group were assessed to be adherent. A characteristic of this study was that adherent patients who used the hypertension logbook had lower SBP and DBP levels in relation to those with alarm pill boxes (in both observed periods).

3. CONCLUSION

Based on the research results we can conclude that in the segments of gender and marital status there was no statistically significant difference in the degree of adherence. The subjects’ age structure significantly affected the degree of adherence, which is to say that elderly persons (pensioners) were significantly more non-adherent. Employment status was also identified as a significant factor of adherence, which means that employed persons were more adherent as compared to those who are not employed. Treatment complexity was also recognized as one of the non-adherence factors, meaning that patients who were concomitantly taking 3 or more drugs were less adherent than those who took 2 or fewer drugs. The study has shown that forgetfulness is also one of the factors affecting the degree of adherence. The duration of hypertension and the length of treatment were not identified as factors of non-adherence. Most of those surveyed believe they were actively involved in the treatment process, were advised to have regular follow-ups, and have observed positive effects of the treatment. Decision to skip a dose and lack of proper information were also identified as reasons for non-adherence.

Based on the obtained research results and the selection criteria, we can conclude that patients are not sufficiently self-critical, which points to a

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29 SBP study group: minimum values: 130 mmHg, 120 mmHg, 115 mmHg; maximum values: 220 mmHg, 180 mmHg, 165 mmHg; mean value: 159 mmHg, 139 mmHg, 134.8 mmHg.
30 DBP study group: minimum values: 70 mmHg, 75 mmHg, 60 mmHg; maximum values: 190 mmHg, 110 mmHg, 100 mmHg; mean value: 95.29 mmHg, 86.52 mmHg, 83.55 mmHg.
31 SBP control group: minimum values: 130 mmHg, 120 mmHg, 110 mmHg; maximum values: 240 mmHg, 185 mmHg, 190 mmHg; mean value: 161 mmHg, 148 mmHg, 142 mmHg.
32 DBP control group: minimum values: 80 mmHg, 75 mmHg, 60 mmHg; maximum values: 160 mmHg, 110 mmHg, 110 mmHg; mean value: 97 mmHg, 90 mmHg, 87 mmHg.
33 Study group: mean SBP value = 139 ± 13 mmHg, mean value DBP = 87 ± 6 mmHg. Control group: mean value SBP = 148 ± 16 mmHg, mean DBP value = 90 ± 8 mmHg, in both cases p<0.01.
34 Study group: mean SBP value = 135 ± 12 mmHg, mean value DBP = 84 ± 6 mmHg. Control group: mean value SBP = 142 ± 16 mmHg, mean DBP value = 87 ± 8 mmHg, in both cases p<0.01.
real need to create adequate measuring models in the segment of adherence degree assessment.

3. REFERENCES


