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THE ROLE OF ADDITIONAL CORRECTION METHODS OF INSUFFICIENT ADHERENCE TO TREATMENT FOR EFFECTIVE BLOOD PRESSURE CONTROL IN PATIENTS WITH RESISTANT ARTERIAL HYPERTENSION

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Abstract

The article considers the results of applying the different correction methods of insufficient adherence to treatment in patients with resistant and pseudo-resistant arterial hypertension on the background of the optimization of antihypertensive therapy in the effective blood pressure control by a doctor and a patient.

Keywords: resistant hypertension, pseudo-resistant hypertension, uncontrolled blood pressure, adherence

Introduction

The prevalence of resistant hypertension, according to various estimates, is from 5 to 30% of hypertensive patients [1 - 4]. Doctors in primary care can expect to encounter resistant hypertension one in every 20 hypertensive patients, compared with higher rates in specialist clinics [3]. However, the true prevalence of resistant hypertension is difficult to quantify because many patients actually suffer pseudo-resistant hypertension, the main reasons of which are lack of adherence to treatment and ineffective antihypertensive therapy (the choice of ineffective drugs, their insufficient number, the use them in small doses etc.) [3 - 6, 11, 12].

At the same time, it is convincingly proved that the better adherence to treatment is, the easier it will be to reach the target blood pressure (BP) [6 - 9].

There are various methods to improve adherence to treatment in outpatient practice: home measurement of blood pressure by a patient with the diary-keeping control, regular visits to the doctor, issuing memos, training and explanatory work by a doctor, writing diaries of self-control with the time of taking the drug by a patient, technical methods: electronic devices with the drug, that record the time and frequency of the drug use, the method of automatic calls for reminding a patient about the drug use, etc [5, 6, 9, 10].

All these methods have their advantages and limitations for the application of the family doctor [9 - 11]. The involvement of a patient to the treatment process: issuing memos, explanatory work by a doctor, writing diaries of self-control with the time of taking the drug by a patient, helps in self-control of blood pressure and lifestyle modification. However, the treatment lasts for years and often changes occur in adherence to treatment and lifestyle. Adherence of the one and the same patient may be different in different time intervals. The motivation of a patient is bigger when he visits the clinic. However, frequent visits to the doctor require additional time, which causes difficulties, especially in employed patients. Application of technical methods of increasing adherence is the most promising, but it has economic limitations [5, 6, 11].

In this regard, it is relevant to work out the methods for correcting the lack of adherence to treatment in patients with resistant hypertension, namely implementation of the home blood pressure monitoring by patients with writing diaries of self-control and the method of telephone consultation (visits), in the family doctor practice.

The aim of the work is to evaluate the results of applying the different correction methods of insufficient adherence to treatment in patients with resistant and pseudo-resistant arterial hypertension on the background of the optimization of antihypertensive therapy in the effective blood pressure control by a doctor and a patient.

Materials and methods of research

120 persons (men - 68 (56.67%), women - 52 (43.33%), average age - $51,6 \pm 2,2$ years) with essential resistant hypertension lasting more than 3 years took were studied prospectively. All patients, primarily, underwent generally accepted differential diagnosis between essential hypertension and symptomatic hypertension. Further, provided the exclusion of secondary (symptomatic) hypertension, patients underwent new methods of differential diagnosis of pseudo-resistant and true resistant hypertension by the assessment of

office blood pressure and ECG, before and 3 hours after intake of three previously appointed antihypertensive drugs [15].

On the results of differential diagnosis, patients were divided into 4 groups:

I group (control) (n=30) - patients with pseudo-resistant hypertension with the conventional correction methods of insufficient adherence to treatment in the family doctor practice;

IA group (basic) (n=30) - patients with pseudo-resistant hypertension who underwent additional correction methods of insufficient adherence to treatment;

II group (control) (n=30) - patients with resistant hypertension with the conventional correction methods of insufficient adherence;

IIA group (basic) (n=30) - patients with resistant hypertension who underwent additional correction methods of insufficient adherence to treatment;

Patients in all groups received three and more antihypertensive drugs at the optimal (maximum tolerated doses). Conventional methods for correcting the lack of adherence to treatment included explanatory work of a doctor, providing recommendations on lifestyle modification, issuing memos for patients with hypertension. Additional correction methods were carried out by introducing the home blood pressure monitoring by patients with writing diaries of self-control and the method of telephone consultation (visits): during the standardized weekly phone calls patients were reminded of antihypertensive drugs intake, the family doctor learned about his health and blood pressure level and, if necessary, performed the correction of appointed antihypertensive therapy.

In all groups at baseline and after 1, 3 and 6 months of treatment we performed office BP measurement and determined adherence of patients to treatment with the help of self-administered questionnaire the Morisky Medication Adherence Scale-4 (MMAS-4) that was evaluated the following way: 0-2 points – non-adherent to treatment; 3- insufficiently adherent to treatment; 4 points - adherent to treatment. This questionnaire was easy to administer and interpret. In addition, adherence estimated from this scale was shown to correlate with results obtained by other methods (pill counts, pharmacy refills) and to correlate with BP control [13, 14].

Statistical processing of the obtained results was performed using the statistical analysis package Microsoft Excel 2010. The reliability of difference between the indicators was determined using T-student criterion and criterion of distribution (χ^2 -Pearson). For a threshold level of statistical significance was taken $p < 0.05$.

Results and discussion

At the beginning of the study and after 6 months of application of the correction methods of insufficient adherence to treatment on the background of the optimization of antihypertensive therapy, effectiveness of these methods was evaluated by measuring office BP in patients with resistant and pseudo-resistant hypertension (fig.1).

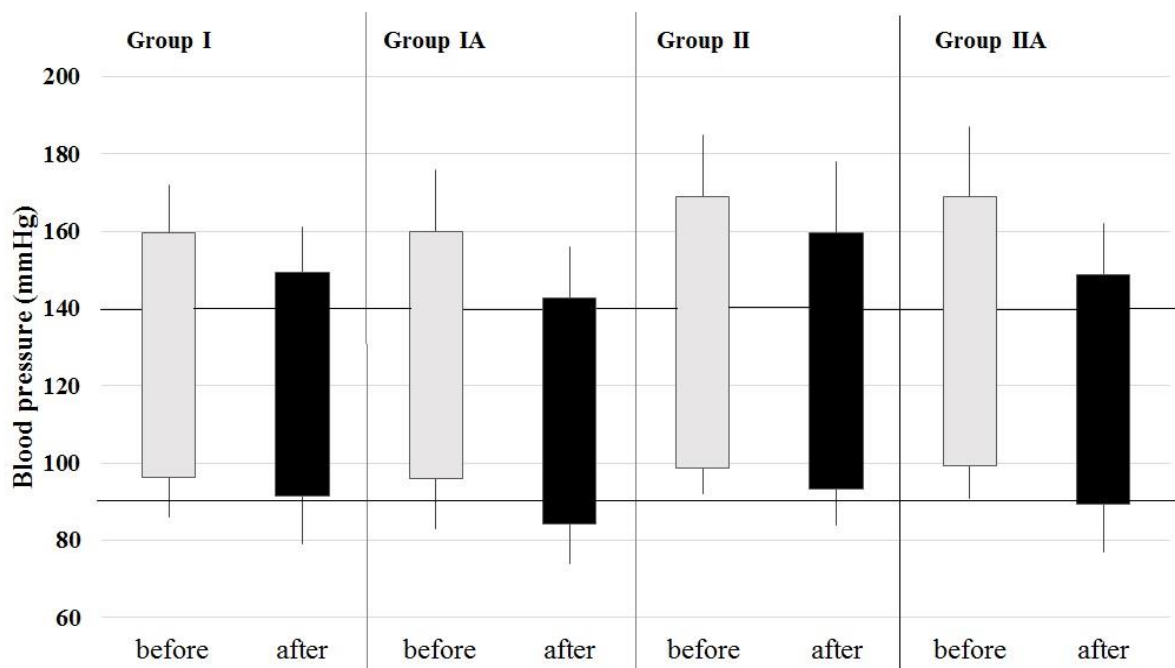


Figure 1. Changes in the office blood pressure observed during 6-month monitoring of adherence in patients with resistant and pseudo-resistant arterial hypertension

The data obtained showed that monitoring of compliance itself reduced blood pressure in all 120 patients with resistant and pseudo-resistant hypertension (from 159.6/96.4 to 149.4/91.4 mmHg in the I group; from 159.9/96.1 to 142.7/84.2 mmHg in the IA group; from 168.9/98.7 to 159.6/93.2 mmHg in the II group and from 169.1/99.2 to 148.9/89.4 mmHg in the IIA group) (fig.1). These results suggest that use of home blood pressure monitoring by patients with writing diaries of self-control and the method of telephone consultation (visits) can improve the efficacy of treatment in patients with resistant and pseudo-resistant hypertension, probably because during the monitoring period blood pressure is controlled both by a doctor and patient. Moreover, the information obtained from the patient during telephone consultation (visits) can help family doctor to make more rational therapeutic decisions.

During the monitoring period, blood pressure was normalized (<140/90 mmHg) in a half of patients with pseudo-resistant hypertension in the IA group - in 17 patients (56.67%), in comparison with the I group - only in 8 (26.67%) patients ($p<0.001$). That is, the application of additional correction methods of insufficient adherence to treatment on the background of the treatment with optimum doses of antihypertensive drugs, allowed to double the frequency of achieving target blood pressure in patients with pseudo-resistant hypertension.

In patients with resistant hypertension in the IIA group blood pressure was normalized (<140/90 mmHg) in a third of patients - in 11 patients (36.67%), in comparison with the II group - only in 4 (13.33%) patients ($p<0.001$).

Thus it was proved that although the use of additional correction methods of insufficient adherence to treatment is more important to effectively control blood pressure in patients with pseudo-resistant hypertension, the application of these methods has also a significant impact on achieving target blood pressure in patients with resistant hypertension.

Adherence of patients to treatment was evaluated at baseline and after 1, 3 and 6 months of treatment with the help of the Morisky Medication Adherence Scale-4 (MMAS-4) (fig.2).

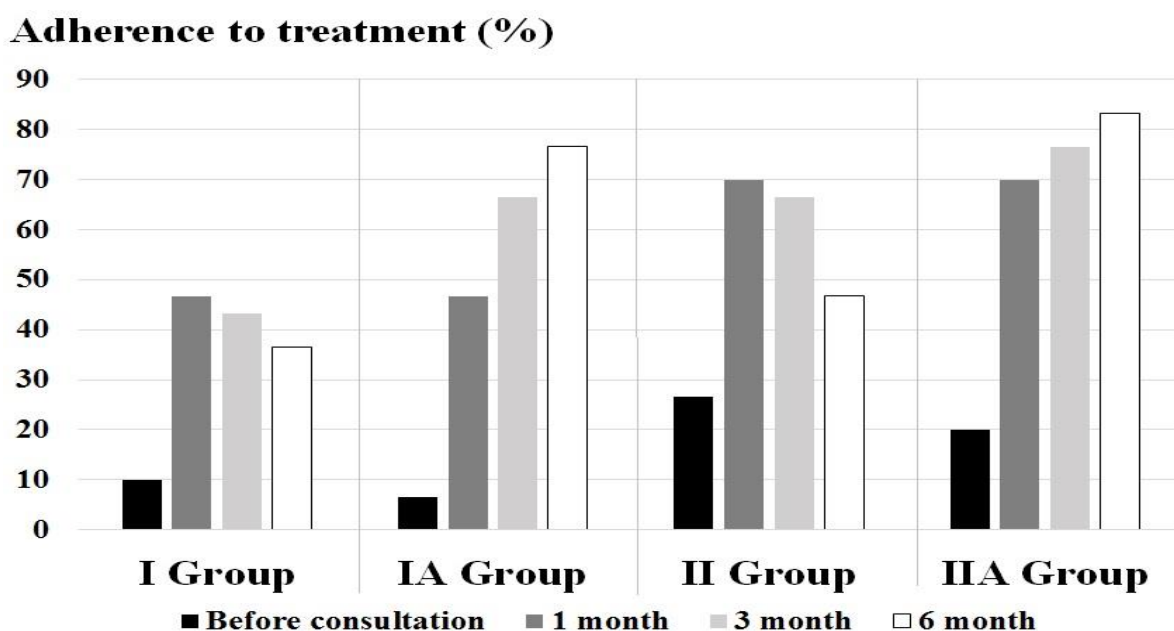


Figure 2. Changes in the adherence to treatment observed during 6-month monitoring in patients with resistant and pseudo-resistant arterial hypertension

The application of additional correction methods of insufficient adherence to treatment, such as the use of home blood pressure monitoring by patients with writing diaries of self-control and the method of telephone consultation (visits), allowed to double adherence to treatment in patients with pseudo-resistant hypertension: in the IA group - in 23 patients (76.67%), in comparison with the I group - only in 11 (36.67%) patients ($p < 0.01$), in which were used only conventional correction methods of insufficient adherence to treatment in the family doctor practice (fig.2).

Thus, the use of additional correction methods of insufficient adherence to treatment in patients with resistant hypertension also allowed to increase adherence to treatment in the IIA group - in 25 patients (83.33%), in comparison with the II group - only in 14 (46.67%) patients ($p < 0.01$). Means that, it should be noted, that additional methods for correcting the lack of adherence to treatment have a significant impact on improving adherence in patients with resistant and pseudo-resistant hypertension (fig.2).

Our data also showed that high adherence to treatment achieved during monitoring period, persisted longer in patients, in whom were applied additional methods for correcting the lack of adherence to treatment (fig.3).

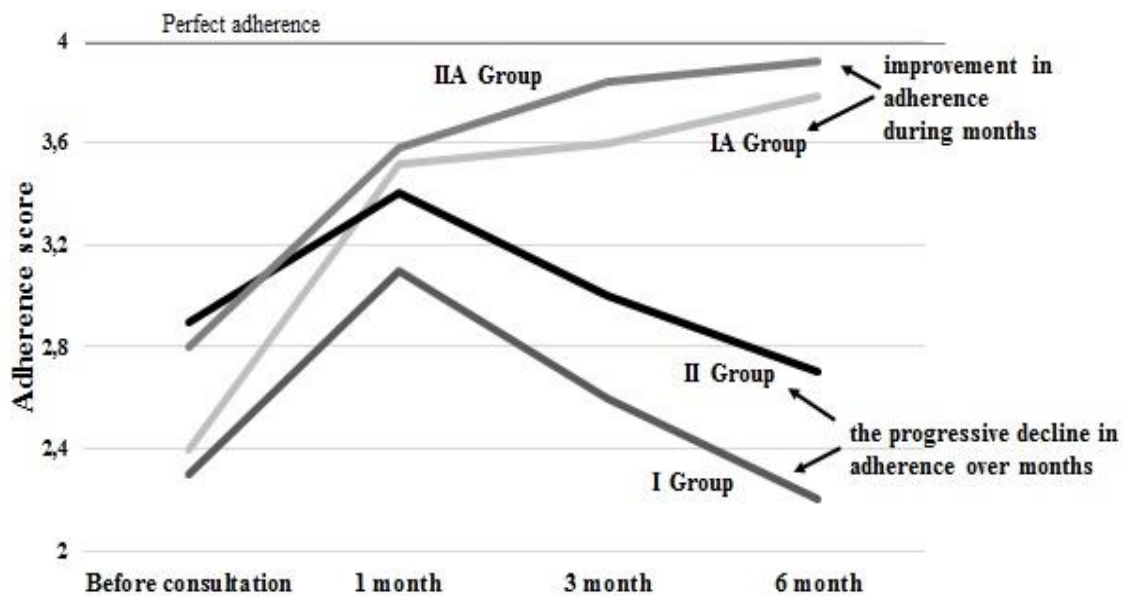


Figure 3. Changes in the adherence to treatment depending on the correction methods of insufficient adherence to treatment, observed in patients with resistant and pseudo-resistant arterial hypertension according to long-term effects of treatment

After a month of monitoring, adherence to treatment did not differ significantly in all groups - I and IA groups ($p>0.2$); II and IIA groups ($p>0.5$), namely, in all groups was observed rather high adherence to treatment and most patients continue to take assigned antihypertensive drugs (fig.3). After three months of treatment the average score of adherence was significantly higher in IA and IIA groups, in which were used the additional methods of correction adherence. Thus, in the I group, after 3 months of treatment, average score of adherence decreased and amounted $2,6\pm 0,07$ points, compared to the IA group - $3,6\pm 0,09$ points ($p<0.001$); II and IIA groups - $3,0\pm 0,3$ points and $3,84\pm 0,1$ points respectively ($p<0.01$). After 6 months of treatment, adherence continued to decline in the I and II groups, and in the IA and IIA groups remained significantly higher. Thus, in the I group, after 6 months of treatment, the average score of adherence was $2,2\pm 0,1$ points compared to the IA group - $3,78\pm 0,1$ points ($p<0.001$); II and IIA groups - $2,7\pm 0,2$ points and $3,92\pm 0,07$ points respectively ($p<0.001$). Provided data shows, that the average score of adherence to treatment in patients IA and IIA groups was significantly higher after 6 months of monitoring, than in the I and II groups, respectively.

Consequently, the application of additional correction methods of insufficient adherence to treatment in patients receiving three or more antihypertensive drugs at optimal doses, allows to achieve the target blood pressure, more than in a half of patients with pseudo-resistant hypertension and more than in a third of patients with resistant hypertension. It should be noted, that although the correction of insufficient adherence to treatment is more important in the effective blood pressure control in patients with pseudo-resistant hypertension, the use of additional correction methods of insufficient adherence to treatment has also a significant impact on achieving the target blood pressure in patients with resistant hypertension. Additional correction of insufficient adherence allows to increase the adherence to treatment, which turn leads to a significant reduction of blood pressure and achievement of the target blood pressure. It has been proven, that the use of the method of telephone counseling (visits) increased the frequency of blood pressure normalization ($<140/90$ mmHg) in patients not only with pseudo-resistant hypertension, but also with resistant hypertension, and that allows us to recommend this method for implementation in family doctor practice. It is also established, that the lower blood pressure values are connected with constant self-monitoring of blood pressure by patients using the home monitoring, which is an important indicator of adherence to treatment.

Conclusions:

1. The application of the additional correction methods of insufficient adherence to treatment, with implementation of the home blood pressure monitoring by patients with writing diaries of self-control and method of telephone consultations (visits), on the background of the prescription of optimal doses of antihypertensive drugs, can double the frequency of achieving the target blood pressure in patients not only with pseudo-resistant hypertension, but also with resistant hypertension.

2. The additional correction of insufficient adherence to treatment can reliably improve the adherence of patients both with pseudo-resistant and resistant arterial hypertension.

3. The high adherence to treatment, achieved during monitoring period, persisted longer in patients, in whom were used the additional methods for correcting insufficient adherence to treatment.

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