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Medication of isolated systolic hypertension stage 3 complicated by gout in senile Patients: Clinical situation

Vladimir A Gorshkov-Cantacuzene*, Irina M Peskova

***Vladimir A Gorshkov-Cantacuzene**

8311 Brier Creek Pkwy, Suite 105-194, Raleigh, North Carolina 27617, USA
Email: hypfoundation@gmail.com

Abstract

The present work reports a clinical case of medication of a senile woman having isolated systolic hypertension Stage 3 complicated by gout. The uniqueness of this case is due to the absence of possible medication in the current Guidelines and other medical literary sources. Consequently, the possibility of administration of high doses of ARB in combination with CCB, which resulted in significant SBP decrease (-41.5 mmHg) and very small DBP decrease (-0.5 mmHg), which is the most beneficial for this pathology.

Keywords

isolated systolic hypertension; gout; clinical situation management.

Abbreviations

ISH: Isolated systolic hypertension; BP: Blood pressure; SBP: Systolic blood pressure; DBP: Diastolic blood pressure; CCB: Calcium channel blocker; ACE inhibitor: Angiotensin-converting-enzyme inhibitor; ARB: angiotensin II receptor blockers

Introduction

Isolated Systolic Hypertension (ISH) is a kind of hypertension characterized, according to the current Guidelines [1-3], by Systolic Blood Pressure (SBP) readings ≥140 mmHg with normal (<90 mmHg) DBP. Although, using such classification, it is difficult to tell the borderline between Hypertension Stage 1 and ISH Stage 1, as, for instance, BP readings equal to 145/86 mmHg may be attributed to either of them. Therefore, the authors claim that ISH should be diagnosed if BP readings are 140-160/<80 mmHg and ≥161/<90 mmHg.

ISH is characteristic in elderly and senile people and is diagnosed approximately in 15-30% of them [4]. Sometimes ISH also occurs in young and healthy males, and according to existing recommendations [3], such patients are advised to change their lifestyle, as the prospective data [5] indicate that the condition is not bound to lead to stable SBP/DBP elevation and, respectively, to the development of hypertension. It is proved that ISH found in elderly and senile patients is a predictor of cardiovascular disease, and is also associated with the 2-5 times increase of cardiovascular mortality rate, the 2,5 times increase of stroke rate and 51% increase of total mortality. Besides, every BP increase by 10 mmHg in such patients (if SBP is higher than 140 mmHg) leads to 30% increase of complication

rate, that is several times higher than in younger patients [6-8].

The main pathogenetic mechanism of BP increase in elderly women is estrogen deficiency, primarily 17-B-estradiol concentration decrease and associated disappearance of protective influence of these hormones on the cardiovascular system [9,10]. Production of nitrogen oxide and prostaglandin I2 (strong vasodilatation and antiplatelet factors) decreases, tissue renin-angiotensin system and sympathetic nervous system are activated, sodium chloride delay is observed, insulin resistance is formed, and therefore, hyperinsulinemia occurs.

Until recently, treatment of patients with ISH was believed to be inexpedient due to possible complications as the result of anti-hypertension medication: However, the SHEP, EWPHE, SYS-EUR, FEVER and MRFIT studies demonstrated [11-16] the efficacy of such therapy, in particular, stroke rate was reduced by 40%, cardiovascular complications proved 30% reduction, ischemic heart disease showed 15% reduction, and the decrease of common cardiovascular and coronary mortality rate was evident. Nevertheless, SBP decrease to slightly lower readings than 140 mmHg, in comparison with SBP 145 mmHg, results in considerable reduction of cardiovascular diseases. SBP was proved to be highly linked with the risk of development of coronary, cerebral and renal complications, than DBP, and, consequently, medication of patients with ISH may considerably improve the forecast.

The main difficulty in selection of medication is low readings of DBP, as well as its possible unexpected and/or dramatic decrease during medication. Moreover, the research by SHEP proved that the decrease of DBP readings per every 5 mmHg facilitates the risk of stroke.

The treatment of elderly and senile patients with ISH must be commenced with lifestyle changes, paying attention to lowering salt uptake to 5 gpd (in case of heart failure – to 3 gpd), weight loss, rejection of bad habits (smoking, alcohol consumption). This may be difficult due to social and cultural environment of the patient, and also the patient reluctance to give up or change their habitual lifestyle.

Medication is administered as a rule to the patients having SBP >160 mmHg, as well as to those having SBP 140-160 mmHg together with such risk factors as diabetes mellitus, angina pectoris and left ventricular hypertrophy.

In elderly and senile patients, hypertension, in particular, ISH, is characterized by lower activity of blood plasma rennin, reduction of artery walls extensibility and elevation of general peripheral blood vessel resistance. In theory, in such conditions diuretics and CCB seem to be the most beneficial. Therefore, to treat ISH in elderly and senile age, according to the current Guidelines, thiazide-type diuretics and dihydropiridine CCB [2,3] should be used. Moreover, some evidence [8,11,14] indicate that the mentioned drugs are the most beneficial, although it is also possible to use ACE inhibitors and β-blockers. There is also some evidence of using olmesartan [17]. In practice, thiazide-type diuretics are most often used in low doses (12.5-25 mg for hydrohlorothiazide), which are believed to be promising in antihypertension therapy.

Case Presentation

Patient L., is a 86-year-old Caucasian woman. She complains about high BP (up to 200/55 mmHg) and, consequently, bad state of health, vertigo, weakness and sometimes insomnia. She has been noticing BP over 140/90 mmHg since the age of 40, when she first measured her BP because of severe headache.

ISH was diagnosed at the age of 80 but the patient does not receive constant therapy, as the scheme administered earlier proved to be inefficient. If SBP raises over 200 mmHg, she takes 10 mg of nifedipina. Gout was diagnosed at the age of 84, and this complicates the selection of antihypertension therapy: At present, the level of uric acid is normal, and the patient does not take any drugs. She works 3 days a week and it should be noted that it takes her to walk 500 m and 40 minutes by public transport (usually standing) to get to work.

By the beginning of the participation in the research program "Management and Research of Hypertension" of the Hypertension Research Foundation, Russian Delegation of the Pontifical Georgian College, BP was 186/62 mmHg, that is, ISH Stage 3.

According to the ECG data, amplitude criteria of left atrial enlargement (without repolarization defects) are present, as a result of high BP; heart rate is 61 bpm. CBC (FBC), blood test and urine test were unremarkable. Osler's test is negative. The MMPI and the Schulte table questionnaire did not reveal any deviations. So high BP readings in combination with relatively insignificant pathologies may show the evidence of good compensatory mechanisms and the organism endurance. This effect may result from the patient's being a professional musician playing a string musical instrument all her life in addition to teaching.

Discussion

The presence of gout limits and complicates the selection of therapy, as it excludes the administration of thiazide-type diuretics. The current Guidelines [2,3] do not imply such a situation. At the same time it should be kept in mind that even when diuretics may be administered to senile patients, the following must be taken into consideration: Manifestations of cellular dehydration and redistribution of electrolytes between the cell and the environment with the tendency to hypokalemia, the properties of neuroendocrine regulation and water and electrolyte exchange in senile patients. As a rule, diuretics are administered in smaller doses, mostly in short courses with obligatory control (and correction) of the electrolyte profile and acid-base state of the organism. Excessive diuretic therapy may lead to hypokalemia and cardiac output reduction as well as kidney bloodstream and filtration reduction and azotemia [18]. Some researchers note low efficiency of diuretic therapy in elderly and senile patients in comparison with middle age patients because of water drinking disorders.

During the first phase (**Figure 1**), monotherapy was administered: 160 mg valsartan (ARB) in the morning, two days later the dose was increased to 320 mg valsartan in the morning and in four more days – to 160 mg valsartan in the morning and 320 mg valsartan in the afternoon.

During the second phase (**Figure 1**) the transition to combined therapy was made: 160 mg valsartan in the morning, 320 mg valsartan in the afternoon and 10 mg nifedipina (CCB) in the evening (before bedtime); in five days the dose was increased to 160 mg valsartan + 10 mg nifedipina in the morning, 320 mg valsartan in the afternoon and 10 mg nifedipina in the evening (before bedtime).

Thus, during the first phase, total daily take of 480 mg valsartan resulted in gradual reduction of BP to 163-167/60-65 mmHg. The patient noticed improvement of well-being and absence of vertigo and insomnia. During the second phase, as the result of total daily take of 480 mg valsartan and 20 mg nifedipina stable range of BP equal to 140-145/60-63 mmHg was maintained together with better health

and mood, sound sleep and absence of dizziness (**Figure 2**).

Although in this case the total dose of valsartan was 480 mg (that is higher than the maximum allowable value), some researchers [19] note the possibility of such medication, besides, when using high doses, the frequency of restoring normoalbuminuria is twice higher than when low doses are used (24% and 12%, respectively). It is pointed out that high doses are well tolerated. Dose-dependent undesirable side-effects, including hyperkalemia, were not registered.

In 2 months BP readings range was 130-140/60-65 mmHg (**Figure 3**) with occasional SBP elevations to 160 mmHg (most often as a response to stress or weather changes). The patient remarks considerable improvement of well-being, absence of vertigo and weakness, sound sleep.

According to the ECG data, normal sinus rhythm, criteria of left atrial enlargement, WPW syndrome; heart rate is 51 bpm. CBC (FBC), blood test and urine test were unremarkable.

Conclusion

The clinical case under consideration evidently demonstrates the possibility of administering high doses of valsartan in clinical practice, as well as high efficiency of combined ARB+CCB therapy in the treatment of ISH Stage 3 complicated by gout. Thus, the selected strategy lead to SBP decrease by 41.5 (±5) mmHg and DBP decrease by 0.5 (±0,05) mmHg, and SBP changes proved to be twice efficient in comparison with average results according to the current Guidelines [2,3]. Moreover, relatively small decrease of DBP should be emphasized.

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Conflict of Interest: Prof. Vladimir A. Gorshkov-Cantacuzene declares that he has no conflict of interest. Dr. Irina M. Peskova declares that she has no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1948 Geneva Declaration and 1964 Helsinki Declaration of the World Medical Association, and Guidelines of the Good Clinical Practice and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from individual participant included in the study.

Figures

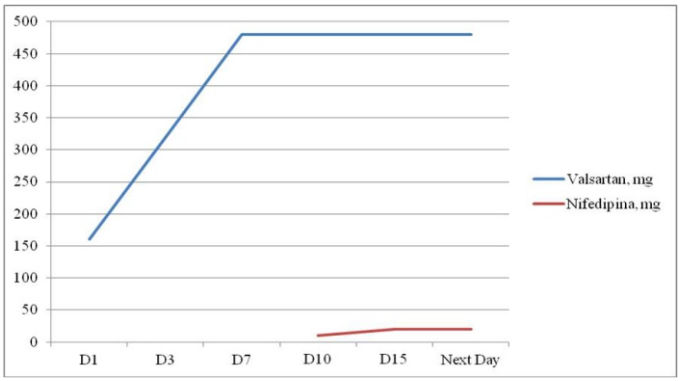

Figure 1: The diagram representing valsartan and nifedipina doses. D1 corresponds to the beginning of the therapy, D1-D7 represent Phase I, D10-Next Day corresponds to Phase I, Next Day represents the present medication.

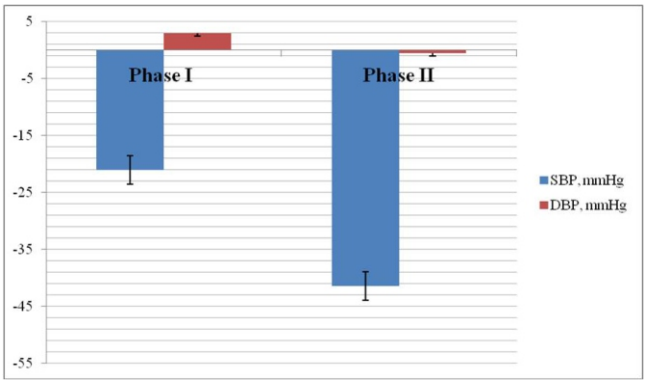

Figure 2: The diagram of BP changes for Phases I and II.

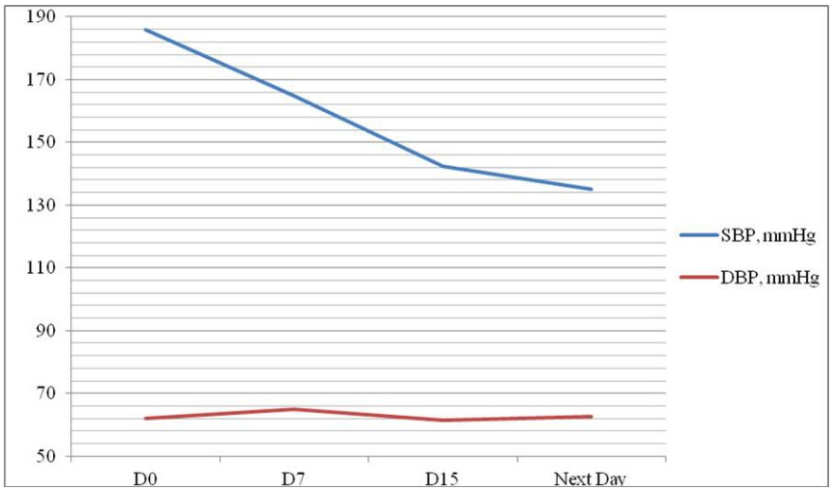

Figure 3: The diagram of BP changes.

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Authors Information: Vladimir A Gorshkov-Cantacuzene[1]*; Irina M. Peskova[2]

[1]Hypertension Research Foundation, Russian Delegation, Pontifical Georgian College, ND, USA
[2]Moscow State University of Education, Moscow, Russia

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