

# Evaluation of systolic blood pressure control in elderly patients with isolated systolic hypertension

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**Abstract.** – The aim of this retrospective study was the evaluation of systolic blood pressure (SBP) control in elderly patients (pts) with isolated systolic hypertension (ISH).

We assessed SBP control (i.e. average of 2 clinic BP measurements < 140 mmHg) in 152 pts (44 M, 108 F, 75 ± 6 years) with ISH (149/84 ± 17/6 mmHg), treated for at least 3 months by general practitioners or specialists with treatments of their choice. Most antihypertensive drugs were used at starting doses in monotherapy or combination treatment, as usual in clinical practice. ECG was abnormal in 82/152 pts (54.0%). All pts were divided in 2 groups according to SBP control. The 2 groups were compared by chi-square test for categorical variables and by Mann-Whitney test for quantitative variables. A p value < 0.05 was considered statistically significant.

The global SBP control rate was 41.4% (63/152 pts). BP was higher in pts with poor SBP control, as expected, but the 2 groups were similar for sex distribution, age, prevalence of other cardiovascular risk factors and type of care (general practitioner or specialist). Pts with poor SBP control had a higher prevalence of abnormal ECG tracings ( $p = 0.003$ ), a lower prevalence of combination regimes ( $p = 0.007$ ) and prescriptions of dihydropyridine calcium antagonists or thiazide diuretics ( $p = 0.006$ ).

Global SBP control rate in our retrospective study in pts with ISH was unsatisfactory. Use of dihydropyridines or thiazides, drugs of choice in the management of ISH according to ESH/ESC and JNCVII guidelines, as single drugs or in combination regimes, can improve BP control and prevent cardiac damage.

*Key Words:*

Elderly, Systolic hypertension, Hypertension control.

## Introduction

Isolated systolic hypertension (ISH) is defined as a systolic blood pressure (SBP) ≥ 140 mmHg associated with a diastolic blood pressure (DBP) < 90 mmHg<sup>1</sup>.

SBP increases with advancing age, in contrast to DBP, which rises until 50 years old, when it declines as a manifestation of age-related increases in central arterial stiffness. The consequence is an age-related increase in the prevalence of ISH in elderly patients<sup>2</sup>.

SBP is a better indicator of increased risk of coronary artery disease than DBP<sup>3</sup>, and it is demonstrated that an individual whose BP 160/70 mmHg is at greater risk than an individual whose BP is 160/100 mmHg<sup>4</sup>. An effective control of ISH reduces total mortality, stroke and heart failure<sup>5-7</sup>. Unfortunately poor SBP control is frequent even in the Framingham Study, where "one might expect community physicians ... to treat hypertension more aggressively than physicians in other communities"<sup>8</sup>.

For all the above mentioned scientific and clinical evidences, international guidelines<sup>1,9</sup> have emphasized the importance of SBP control, eventually recommending different choices of antihypertensive drug treatment from the general population.

To assess the impact of different drug treatment regimens in community medicine, we set up a cross-sectional study to evaluate the rate of systolic blood pressure control in elderly patients with ISH in our unit of Preventive Cardiology located in a National Health Service clinical center.

## Material and Methods

We studied 152 patients (44 M, 108 F,  $75 \pm 6$  years) with ISH ( $149/84 \pm 17/6$  mmHg) who were treated for at least 3 months by family physicians (51/152 patients, 33.6%) or specialists (101/152 patients, 66.4%) with treatment regimens of their choice which could include all classes of antihypertensive drugs in monotherapy or in combination: angiotension converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs),  $\beta$ -blockers, thiazide diuretics, dihydropyridine calcium-antagonists (DHPCA) and  $\alpha$ 1-blockers. Most antihypertensive drugs were used at starting doses, as usual in clinical practice.

In our unit, all the patients underwent a complete physical evaluation, including office blood pressure (OBP) measurement (average of two readings in the sitting position), and an ECG. It was also administered a double-choice questionnaire to assess other cardiovascular risk factors (overweight, i.e. body mass index  $> 25$  kg/m<sup>2</sup>; hypercholesterolemia, i.e. total cholesterol  $> 5.2$  mmol/l or 200 mg/dl; smoking of 5 or more cigarettes per day; diabetes mellitus). Other cardiovascular risk factors were present in 69/152 patients (45.4%). ECG was abnormal (left atrial and/or ventricular enlargement, left bundle branch block) in 82/152 patients (54.0%) (Table I).

We divided all patients in 2 groups according to adequate SBP control, i.e.  $< 140$  mmHg (average of 2 OBP readings), following international guidelines<sup>1,9</sup>.

The 2 groups were compared by chi-square test for categorical variables (sex, presence of ECG abnormalities, presence of other cardiovascular risks, type of care: general practitioner or specialist, treatment regimen, class of drugs) and by Mann-Whitney test for quantitative variables (age, heart rate, SBP, DBP). A  $p$  value  $< 0.05$  was considered statistically significant.

## Results

An adequate SBP control was found in 63/152 patients (41.4%).

The 2 groups (Table II) were similar for sex distribution, age, prevalence of other car-

diovascular risk factors and type of care, but BP levels were higher in patients with poor SBP control ( $p < 0.0001$ ), as expected.

Patients with poor SBP control had: a higher prevalence of abnormal ECG tracings ( $p = 0.003$ ), a lower prevalence of combination regimens ( $p = 0.007$ ) and use of DHPCA and/or thiazide diuretics as monotherapy or in a combination treatment ( $p = 0.006$ ).

Use of other antihypertensive medications (ACE-inhibitors, ARBs,  $\beta$ -blockers,  $\alpha$ 1-blockers) prescribed not following international recommendations on treatment of ISH<sup>1,9</sup>, did not influence SBP control.

## Discussion

The results of this cross-sectional study confirm the unsatisfactory SBP control rates in elderly hypertensives<sup>8</sup>. Possible causes for this situation include the fact that physicians may still be more prone to focus on DBP rather than SBP, or that SBP among older patients with ISH may be more difficult to bring under control because of the chronic pathophysiological changes that occur in the capacitance vessels when they are exposed to chronically increased BP<sup>10</sup>.

There is evidence that the treatment of ISH in the elderly results in significant cardiovascular benefit. The Systolic Hypertension in the Elderly Program (SHEP) showed that drug treatment had a 36% reduction in the risk of stroke and a 27% reduction in coronary heart disease events<sup>6</sup>. It is evident that "SBP should become the principal end-

**Table I.** Characteristics of study subjects.

Number of patients	152
Gender (M/F)	44/108
Age (mean $\pm$ SD, years)	$75 \pm 6$
BP (mean $\pm$ SD, mmHg)	$149/84 \pm 17/6$
Number of patients with other risk factors	69 (45.4%)
Number of patients with abnormal ECG	82 (54.0%)
Number of patients treated by family physicians	51 (33.6%)
Number of patients treated by specialists	101 (66.4%)

**Table II.** Quantitative and categorical variables of the 2 groups.

	Patients with not controlled ISH* (n = 89) SBP ≥ 140 mmHg and DBP < 90 mmHg	Patients with controlled ISH* (n = 63) SBP < 140 mmHg and DBP < 90 mmHg	p
Age (years)	76 ± 7	75 ± 6	Ns
Heart rate (bpm)	69 ± 11	67 ± 10	Ns
Systolic blood pressure (mmHg)	161 ± 13	134 ± 5	< 0.0001
Diastolic blood pressure (mmHg)	85 ± 5	82 ± 6	< 0.0001
Gender (M/F)	28/61	16/47	Ns
General practitioners/Specialists (n)	30/59	21/42	Ns
Patients with other risk factors (n)	38 (42.7%)	31 (49.2%)	Ns
Patients with abnormal ECG (n)	55 (62.0%)	27 (43.0%)	0.003
Patients in monotherapy (n)	58 (65.2%)	31 (49.2%)	Ns
Patients in combination therapy	31 (34.8%)	32 (50.8%)	0.007
Patients taking calcium antagonist and/or thiazide diuretics	50 (56.2%)	49 (77.8%)	0.006
Patients taking other antihypertensive medications†	64	51	Ns

\*ISH isolated systolic hypertension, † angiotension converting enzyme inhibitors, angiotensin II receptor blockers, b-blockers, a1-blockers.

point for the detection, evaluation, and treatment of hypertension, especially in the middle-age and older American<sup>4</sup> and our study has demonstrated that the rate of SBP control can be improved in daily clinical practice by increasing the use of DHPKA or thiazide diuretics as single drugs or in combination regimes, as suggested by JNC VII and ESH/ESC guidelines<sup>1,9</sup>, that refer to interventional trials.

Moreover, it is noteworthy that, in our cross-sectional study reflecting daily clinical practice, both family physicians and specialists failed to bring SBP under control. This could also be due to the dosages of antihypertensive medications that were used at standard starting (i.e. low) doses as monotherapy or in combination. The logical consequence of this observation is that prescribing physicians were not prone to titrate doses of single drugs, but eventually to use low-dose combination treatments, as suggested by international guidelines that reflect concerns about the risk of side effects especially in the elderly<sup>1,9</sup>. This strategy was successful in some cases as demonstrated by the higher prevalence of combination regimens in our controlled subjects, but nevertheless, as it is showed in large epidemiological surveys<sup>8</sup>, the BP control rate was unsatisfactory.

We suggest that the clinician's therapeutic work-up to increase SBP control should include: (a) implementation of recommended international guidelines of ISH management, that means use of thiazide diuretics and/or DHPKA when not contraindicated; (b) dosage increase of other well tolerated antihypertensive medications<sup>11-14</sup>, not specifically recommended for ISH management, but, when used at higher than starting doses, effective in reducing SBP and preventing target organ damage<sup>13,14</sup>.

In conclusion, we presented the results of a community-based cross-sectional study showing that application of recommended international guidelines of ISH management can improve SBP control and prevent cardiac damage.

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