

Awareness, Treatment, and Control of Hypertension in the Elderly in a General Practice Experience

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Summary: In 3858 ambulatory elderly people (age ≥ 65 years) prevalence of hypertension was 67.8%. The hypertensive status was unknown to both the doctor and the patient in 21.4% of cases. More than 90% of known hypertensives were treated, but hypertension could be considered as controlled in less than 30% of them.

Key words: aged population, hypertension, control, occurrence, therapy

Introduction

The increasing size of the elderly population and its burden of morbidity and care on public health organization and costs has inevitably focused attention on this population group. The benefit/risk profile of chronic treatment is mostly based on the findings of studies in which older groups are scarcely represented and can therefore hardly be extrapolated or applied to the elderly population.

Hypertension is a classic example of this situation. Its relevance as a risk factor for cardiovascular events is es-

tablished, though reliable data are scant.¹⁻³ In most studies the benefit/risk profiles for pharmacological treatment in the elderly have been derived from retrospective analysis in the oldest subgroups of adult populations.⁴ Among the carefully controlled studies on specific elderly populations, only two have recently published their results, but because they concern rather small and possibly selected populations these provide a first look at the problem rather than a case for or against treatment of the different forms of hypertension in the aged people.^{5,6} Large randomized studies are undoubtedly needed to define the role of pharmacological and other treatments in the elderly with various degrees of hypertension, but it was felt that medically useful information could also be gathered through an epidemiological study of the prevalence, awareness, treatment, and control of hypertension in an elderly population. Thus, in cooperation with a group of general practitioners (GP) recruited on a voluntary basis, a large cohort of over 4000 outpatients was enrolled in a descriptive and prospective study of the quality of care of hypertension in an elderly outpatient population: the Study of Blood Pressure in the Elderly (Studio sulla Pressione Arteriosa nell'Anziano, SPAA).

Methods

A total of 444 GP, members of the Italian National Health Service, took part in the study. The organization of the study, the characteristics of the participating physicians and the quality of collected data have been reported in detail elsewhere.⁷ All the physicians who agreed to participate attended preliminary meetings, under the supervision of a central and local coordinator, during which they checked their sphygmomanometers and were trained in the standard methods of BP⁸ and anamnestic recording. A pilot study, with two patients recruited for each physician, was completed and cases were analyzed and discussed in further general meetings.

†The names of the 444 participating doctors were published in: F. Avanzini, C. Alli, A. Andreani *et al.*: S.P.A.A.: Studio sulla pressione arteriosa in pazienti anziani ambulatoriali. *Practitioner*. 75, 74 (1984)

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Each GP agreed to enter a sample of 10 patients among those aged over 64 years coming to his/her offices for any reason; the first eligible patient was chosen every day until recruitment was completed. To minimize biased recruitment, the few physicians accustomed to concentrating the visits of hypertensive patients in the first office hour were asked to renounce such practice for the duration of the recruitment period. A list of all outpatients attending the surgery during the recruitment period was used to verify correctness of the admission phase.

The initial assessment of each patient consisted of an examination at recruitment and a further visit one week later. The purpose of the study was explained to the patient and consent was obtained.

Body weight and height of all patients were measured during the initial visit; information was taken on physical activity, smoking, and drinking habits; medical and pharmacological history was taken with specific attention to features or events related to the cardiovascular and cerebrovascular systems. Each patient's BP and heart rate (HR) were recorded during the initial and the second visit, first with the subject sitting, then after lying down for 5 min, then again after 30 s erect. BP measurements were first made on each arm, in the sitting position; subsequent measurements were made on the arm with the highest values. Average BP values in the supine position at the

two visits were used to define the patient's BP status. Systolic and diastolic BP (SBP and DBP) were recorded at Korotkoff phases I and V (rounding the reading to the nearest even mmHg).

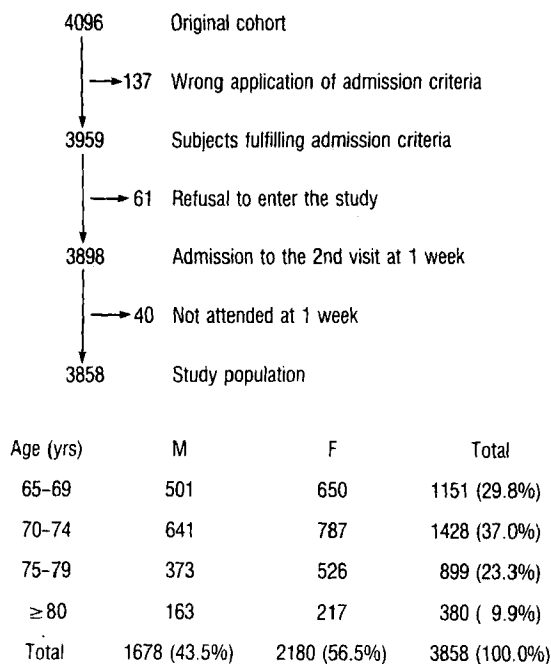
Subjects were defined as hypertensive with BP > 160/90 mmHg or with normal blood pressures during antihypertensive therapy. Regardless of medication status DBP elevation was defined as mild if mean DBP was between 90 and 104 mmHg, moderate between 105 and 114, and severe over 114 mmHg. SBP elevation was considered isolated when DBP was < 90 mmHg. In the absence of antihypertensive treatment, the same BP levels were used to define mild, moderate, severe, and isolated systolic hypertension. Antihypertensive treatment was considered to provide satisfactory control of BP if the average values were < 160/90 mmHg.

Data were recorded on a form designed for computer use. The recruitment process, carried out in 1983, and the resulting population base are summarized in Figure 1.

Results

Prevalence of Hypertension

Figure 2 illustrates the frequency distribution of SBP and DBP in the whole study population according to treat-



Mean age 72.7 ± 4.9 yrs (range 65-96 yrs)

Nursing home patients: 39 (1.0%)

FIG. 1 Recruitment process of SPAA and distribution by sex and age of the study population.

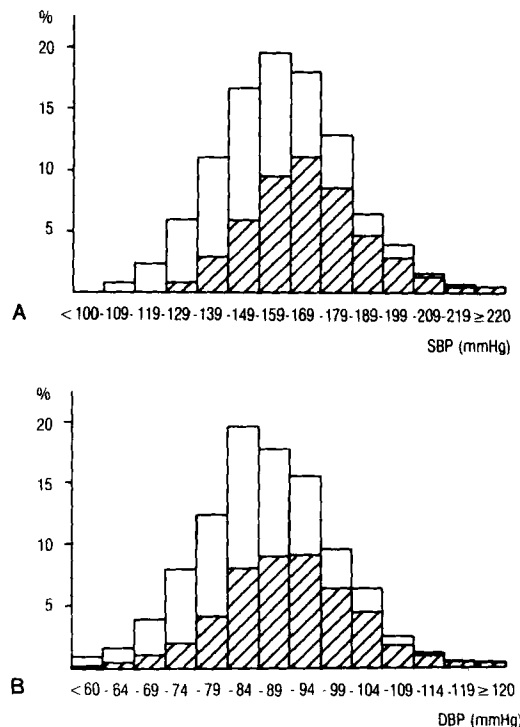


FIG. 2 Frequency distribution of systolic (A) and diastolic (B) blood pressure in the whole study population (n=3858) according to antihypertensive treatment status. (SBP=systolic blood pressure; DBP=diastolic blood pressure). □ untreated; ▨ treated.

ment status. SBP > 160 mmHg was found in 43.8% and DBP > 90 mmHg in 36.0% of cases, regardless of the presence or absence of treatment. Only 2.8% of cases showed SBP > 200 mmHg and 0.9% had DBP > 115 mmHg.

Average values of SBP and DBP were both significantly higher in females than males (159.2 ± 21.1 vs. 153.5 ± 20.6 mmHg and 86.5 ± 11.0 vs. 84.5 ± 11.1 mmHg, respectively). SBP tended to rise with age in both sexes (from 152.6 ± 20.2 mmHg in subjects aged 65–69 years to 160.8 ± 20.2 mmHg in subjects over 80 years old), whereas DBP did not.

The prevalence of hypertension was 67.8%, significantly higher in females than males (73.1 vs. 61.0%, $p < 0.001$) and rose with age ($p < 0.05$) (Fig. 3). BP categories in the hypertensive patients according to medication status are reported in Figure 4. Females presented a higher proportion of hypertension in all the categories considered. Only isolated SBP elevation showed a definite association with age (from 16.3% in the 65–69 year age group to 36.3% in the group over 80 in treated hypertensives; from 24.1% to 60.0% in untreated ones).

Awareness, Treatment, and Control of High Blood Pressure

In 557 patients (21.3% of the 2616 hypertensives), the hypertension was unknown to the patient and GP. In 194 (7.4%) it was known but not treated. The remaining 1865 (71.3%) were receiving treatment (Fig. 5).

Unrecognized hypertension. There were more cases of unrecognized hypertension among males than females (25.6% vs. 18.5%). No relationship was found between awareness of the hypertension and age. Of the subjects who were unaware of their hypertension, 95.9% had mild diastolic or isolated systolic hypertension.

Known hypertension. The mean duration of known hypertension was about 10 years. In 48.6% of cases the condition had been diagnosed when the patient was already 65 years old or more.

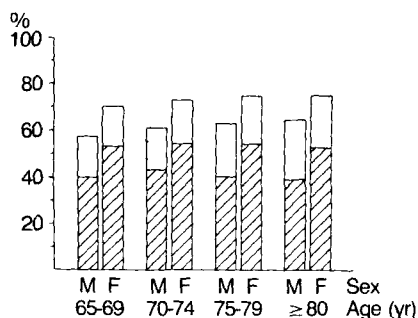


FIG. 3 Prevalence of hypertension in the whole study population (n=3858) by sex and age according to antihypertensive treatment status. □ untreated; ▨ treated.

Known, untreated hypertension. Of the 194 known, untreated hypertensives, more than half (52.6%) had mild diastolic hypertension, 9.3% had moderate diastolic hypertension, 3.1% severe diastolic hypertension, and 35.0% isolated systolic hypertension.

Treated hypertension. Hypotensive treatment had been prescribed for a mean of 8.9 years, and in 52.7% of patients therapy had started when they were 65 or more years old. No relationship could be established between hypotensive treatment and sex in this subgroup. The proportion of known hypertensives on treatment dropped very slightly with rising age (from 92.7% in the 65–69 year age group to 88.2% in those over 80).

Less than one third of the treated subjects (28.9%) had their BP well under control. Most of these treated hypertensives had mildly raised DBP (90–104 mmHg) or isolated high SBP (Fig. 4). Only 2.1% of the latter had values over 200 mmHg. Among the treated subjects, 50.2% were taking one, 44.3% were taking two, and 5.5% more than two active principles. The largest proportion (85.5%) was prescribed diuretics.

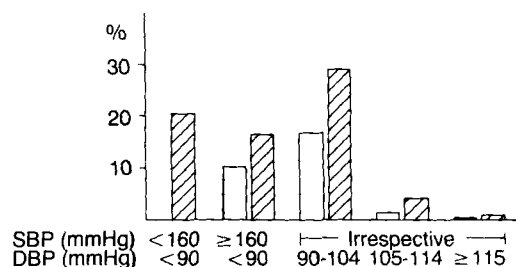


FIG. 4 Hypertensive population (n=2616) categorized by blood pressure levels according to treatment status. (SBP=systolic blood pressure; DBP=diastolic blood pressure). □ untreated; ▨ treated.

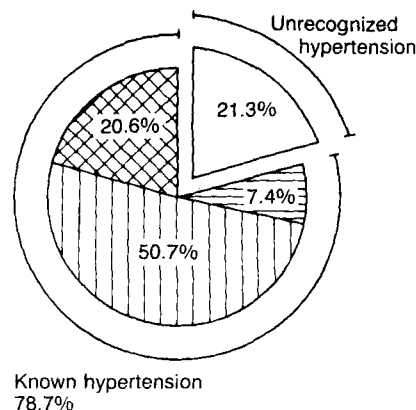


FIG. 5 Awareness, treatment, and control of hypertension in hypertensive subjects (n=2616). □, unrecognized; ▨, known, untreated; ▩, treated but uncontrolled; ▤, controlled by treatment.

Discussion

A very high prevalence of hypertension was found among elderly outpatients: 3 elderly out of 4 attending their own physicians' offices are hypertensives. This indicates that high BP in the elderly is one of the largest problems GPs have to deal with in their daily practices. The prevalence of hypertension was higher in females and rose with age, in agreement with the findings of other surveys.¹⁻⁹⁻¹⁵ The increase with age was largely linked to the higher proportion of subjects with elevated systolic BP.

The results of major studies providing hypertension prevalence data in the elderly are summarized in Table I. The higher prevalence observed in our study cannot be explained by differences in age and sex of the populations since this higher prevalence persists even on comparing subgroups homogeneous for age and sex. Moreover, the prevalence figures of our study remain definitely higher than in the others even if the findings are reanalyzed based on the criteria used in those studies to define hypertension. Quite possibly, the main factor explaining the excess of hypertensive patients in our study is that the cases were elderly outpatients, not the elderly as a whole. This

probably resulted in the selection of subjects many of whom would have contacted their GPs because of their high BP.

Isolated elevation of systolic BP was found (regardless of whether the patients were under treatment or not) in 18.1% of the case list, more frequently in females. The proportion of subjects with isolated SBP elevation in our study population lies midway between the high levels (15-30%) found in surveys dating from the 1960s and the lower levels (5-8%) found in the 1970s^{10,19,20} (see Table II). These differences are probably attributable to the different proportions of hypertensive patients receiving treatment: low in the earlier surveys, much higher in more recent ones. Therefore, the findings from recent studies do not provide a firm basis for estimating the true prevalence of isolated systolic hypertension. Some patients with only high SBP values receiving treatment may well have originally been systodiastolic hypertensives whose DBP was well controlled by treatment. By definition controlled systolic hypertensives do not meet the inclusion criteria for systolic hypertension. In our study population about one third of all hypertensive patients not receiving treatment were cases of isolated systolic hypertension.

TABLE I Synopsis of prevalence data from the main studies on hypertension (H) in the elderly^a

Study	Garland <i>et al.</i> (1972-74) (9)	HDFP (1972-73) (7)	CHEC Program (1973-75) (24)	Dunedin Program (1975) (12)	NHANES II (1976-80) (8)	SPAA (1983)
Population base (no.)	2636	34012	206201	4247	2607	3858
Age interval (yrs)	≥60	60-69	≥65	≥65	65-74	≥65
Origin of the population	C	CRS	CS	RRS	PRS	ARS
Criteria for defining hypertension	≥160/90 or AT	≥90 or AT	≥90	≥160/95 or ≥160/90 or AT	>140/90 or AT >160/95 or AT	>160/90 or AT
Overall hypertension prevalence	45.2	42.1	31.9	37.0	64.3	67.8
Hypertension already known (% of all hypertensives)	—	—	—	—	62.9 79.7	78.6
Treated hypertensives (% of all hypertensives)	38.9	—	—	63.4	47.8 68.1	71.2
Criteria for defining controlled hypertensives	—	<90	—	≤160/95	<140/90 <160/95	<160/90
Controlled hypertensives (% of all hypertensives)	—	35.3	—	39.9	13.3 41.2	20.6

^aWith the obvious exception of SPAA, data refer U.S. populations.

Abbreviations: C=whole local community; CRS=community: random sample; CS=community: nonrandom sample; RRS=retirement area: random ambulatory sample; PRS=general population: random sample; ARS=population GP office: random sample; AT=antihypertensive treatment.

TABLE II Isolated systolic blood pressure (SBP) elevation—main prevalence studies^a

Study	NHES (1960-62) (20)	Colandrea <i>et al.</i> (1965) (3)	Evans Co. Study (1967-69) (25)	HDFP (1972-73) (6)	Garland <i>et al.</i> (1972-74) (9)	NHANES II (1976-80) (8)	SPAA (1983)
Population base (no.)	6400	3245	879	33979	2636	2607	3858
Age interval (yrs)	65-79	M 69.7 F 68.3 (mean age) ^b	60-89	60-69	>60	65-74	>65
Origin of the population	PRS	RS	CS	CRS	C	PRS	ARS
High SBP prevalence (%)	M (65-74) 15.0 ^c (75-79) 26.9 ^c	M 14.9 F 12.3	M (60-69) 5.9 (70-79) 16.4 (>80) 21.0	6.8	(60-64) 3.3 (65-69) 4.8 (70-74) 8.7 (>75) 10.9	8 ^d	M (65-69) 11.2 (70-74) 15.4 (75-79) 17.4 (>80) 30.7 F (65-69) 12.8 (70-74) 18.3 (75-79) 24.9 (>80) 32.3

^aWith the obvious exception of SPAA, data refer to U.S. populations. High SBP is defined as SBP > 160 and diastolic blood pressure < 90 mmHg regardless of the medication status in all the studies, with two exceptions: NHES adopts the > 160/95; Garland *et al.* include only nontreated > 160/90 mmHg subjects.

^bAround 3% of the population is < 55 yrs; around 25% between 55-64 yrs.

^cData referred to caucasians.

^dAs estimated from the published histogram.

Abbreviations: PRS=general population:random sample; RS=retirement area: nonrandom ambulatory sample; CS=community: non-random sample; CRS=community: random sample; C=whole local community; ARS=population attending GP offices; random sample.

A high proportion of hypertensives were already known (78.6%) in accordance with findings in other elderly populations.^{9,15,20} This value is markedly higher than reported in studies of the middle-aged population in Italy^{12,21,22} and elsewhere,^{9,15} and is probably linked to the fact that the elderly come into contact with health strictures more often than middle-aged adults and are therefore more likely to be diagnosed.

However, since 96.8% of subjects were reported to be known to the doctors and 95.5% of them had been visited within the previous 6 months, the proportion of not previously diagnosed hypertensives (21.3%) was noteworthy.

In agreement with recent reports,^{9,20,23} the SPAA turned up an interestingly high percentage of elderly patients on antihypertensive treatment: 71.2% of all the hypertensives and more than 90% of known hypertensives. This is typical of the industrialized countries and is the outcome of a gradual change in therapeutic attitudes toward hypertension in the elderly. For example, in the United States the proportion of elderly hypertensives receiving treatment has grown gradually from a few percent in the 1960s,¹⁷ to 40% in the early 1970s,¹⁰ and 60-70% in the late 1970s.^{9,20,23} A much higher proportion of elderly patients than young adults receives treatment, the NHANES II,²⁰

covering a population in a broad age range, confirmed this. The differences cannot be explained merely by the larger proportion of known hypertension in the older age groups.

This tendency to treat geriatric hypertension is a clear example of how clinical practice does not always apply research findings, as we still lack definite proof of the utility in the elderly of treating the two most frequent forms of hypertension: mild diastolic and isolated systolic hypertension.

Italian GPs have a definite tendency to overtreat, but the opposite occurs too: a certain proportion (about 13%) of known hypertensives not under treatment presented DBP > 105 mmHg in our study.

In our case list, the proportion of treated hypertensives whose BP was optimally controlled was small: 28.9%. This is much lower than in other recent studies,^{9,20,23-25} and cannot be explained by the criterion we adopted to define good control (BP < 160/90 vs. BP < 160/95 mmHg usually applied in other studies). Even applying these latter values, the percentage of well-managed hypertensives in our case list rises little (34.9%). Most uncontrolled hypertensive patients present either very slightly elevated DBP or isolated elevation of SBP, as the possible result of a less aggressive therapeutic approach to hypertension in the elderly patient. Patients' poor com-

pliance to treatment could also account for this result. The discrepancy found between recommendable diagnostic and therapeutic practices and the real-life care of hypertension in the elderly in different settings strongly supports the need for combining formal controlled studies with monitoring schemes to check that antihypertensive treatment actually gives the benefits expected.

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