

How well is hypertension managed in the community? A population-based survey in a Brazilian city

O manejo da hipertensão arterial sistêmica na comunidade: Estudo de base populacional em uma cidade brasileira

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Abstract *There is usually little information available on how well hypertensive individuals are managed at the community level. This survey measured the frequency of hypertension in a medium-sized Brazilian city by studying a cluster sample of 1657 adults aged 20-69 years. The 328 hypertensives (19.8%) answered a questionnaire on the knowledge and management of their condition. Two-thirds were aware of their status and more than half were on antihypertensive medication, but only one-third had their blood pressure under control. Physicians failed to advise a large proportion of their patients about the need to lose weight, take exercise, and quit smoking. Although laboratory tests were carried out in most patients, fundoscopy and chest X-rays were performed in fewer than 50%. Continued care by the same physician was the only factor significantly associated with compensated high blood pressure (relative risk for not having continued care = 1.35; 95% CI = 1.02-1.71). High levels of absenteeism, reduction of the work load, and early retirement were found among the individuals with high blood pressure.*

Key words *Hypertension; Blood Pressure; Epidemiology; Risk Factors*

Resumo *Há poucas informações disponíveis a respeito do manejo de pacientes hipertensos na comunidade. Esse estudo mede a frequência de hipertensão em uma cidade de médio porte do Brasil ao estudar uma amostra aleatória de 1.657 adultos com idade entre 20 e 69 anos. Os 328 hipertensos (19,8%) encontrados foram submetidos a um questionário que investigava o conhecimento a respeito de sua condição e dados do manejo deste problema. Dois terços deles sabiam ser hipertensos, mais da metade usava medicação para hipertensão, mas apenas um terço apresentava cifras tensionais controladas. Os médicos não recomendaram, para muitos dos seus pacientes, realizarem exercícios físicos, abandonar o tabagismo e reduzirem o peso corporal. Embora exames laboratoriais tenham sido realizados em muitos pacientes, exame de fundo de olho e Rx de tórax foram feitos em menos de 50%. Cuidado médico continuado pelo mesmo médico foi o único fator significativamente associado com cifras tensionais controladas (risco relativo para não ter cuidado médico continuado = 1,35, com intervalo de confiança de 95% de 1,02 a 1,71). Níveis elevados de absenteísmo, redução da carga de trabalho e aposentadoria precoce foram revelados entre os hipertensos.*

Palavras-chave *Hipertensão; Pressão Arterial; Epidemiologia; Fatores de Risco*

Introduction

In the State of Rio Grande do Sul, in southern Brazil, cardiovascular diseases are the main causes of death in adults (MS, 1992). Hypertension is a universally important risk factor for these diseases (Costa, 1983; Duncan, 1991; Peach & Heller, 1984).

In order to prevent such deaths, it is essential that hypertensives receive adequate management from health care services (Cruikshank et al., 1987; *The Lancet*, 1985; Amery, 1985; HDFPCG, 1982). However, studies from other countries have shown that hypertensives are often unaware of their disease. Even among those who know their condition, many do not comply with the recommended treatment, and of those under therapy, a fair proportion remain uncontrolled (Pedoe, 1982).

Population-based studies are highly useful for both evaluating the control of hypertension and planning services. Studies restricted to health services may provide information on quality of care for users but will fail to identify hypertensives who either are unaware of their condition or refuse to be treated (HDFPCG, 1982). No studies are available in Brazil or in Latin America as a whole which evaluate hypertension management from a population-based approach.

In 1992, a representative cross-sectional study was carried out in the urban area of Pelotas, Rio Grande do Sul State, with the objectives of measuring the prevalence of hypertension among adults aged 20 to 69 years and evaluating the role of a number of risk factors (Piccini & Victora, 1994).

For hypertensive subjects identified in the study, information was collected on awareness of their condition (Saver et al., 1982), use of health care services, compliance with treatment, controlled blood pressure, and social repercussions of the disease.

A secondary objective was to explore whether controlled blood pressure among hypertensives was associated with sex, age, race, social class, schooling, obesity, smoking, distance to health care provider, and continuity of care (Saunders, 1980; Weimberger, 1988).

Methodology

The present study had a cross-sectional design with a population basis. Twenty-five census tracts in the urban area of Pelotas (300,000 inhabitants) were selected through random sampling. In each tract a block was chosen at ran-

dom and a corner was selected to start the study. From there, one out of every four households was visited systematically until having completed 36 houses in each tract.

The sample size was calculated to estimate a hypertension prevalence of 15%, with an acceptable error of less than 2%.

A standardized, precoded, pretested questionnaire was given to all adults aged 20 to 69 years residing in these households. It included information on age, sex, race, social class, schooling, smoking, and distance to health care provider. Awareness of being hypertensive was also investigated, and whenever applicable information was collected on the characteristics and continuity of care.

Weight and length were measured with portable equipment. Obesity was defined as a weight/length squared of over 27.3 for women and 27.8 for men according to the US National Health and Examination Survey II (Millar & Stephens, 1987). Blood pressure was taken with a aneroid sphygmomanometer at the end of the interview with subjects in the sitting position, right arm supported at the level of the mammary line. The systolic pressure was recorded at the beginning of auscultative sounds and the diastolic level when they disappeared (stage V). Sphygmomanometers were calibrated twice weekly. The interviewers were senior medical students who were trained and subjected to standardization sessions.

Five percent of the households were revisited to check whether the interview had actually been carried out and to verify the repeatability of the data. The field work was carried out from March through June 1992.

Diagnostic criteria for hypertension were a systolic level of 160 mmHg or higher and/or a diastolic pressure of 95 mmHg or higher (Costa, 1983; HDFPCG, 1982; MC, 1980; Party, 1985). Patients on anti-hypertensive medication were also included, regardless of their blood pressure levels.

Hypertension was considered to be under control whenever blood pressure was less than or equal to 160/90 mmHg.

A widely used classification for social class in market research in Brazil was adopted, ranking families according to household possessions (Lombardi et al., 1988; Bronfman & Tuirán, 1984).

Data were entered with the EPIINFO software (Dean et al., 1994). Analysis was performed with SPSS/PC+ (Norusis, 1986) and EGRET – Epidemiological Graphics, Estimation and Testing Package (1988).

Results

A total of 1834 individuals aged 20 to 69 years were identified in the 900 households visited. Of these, 1657 (90.3%) were successfully examined. Distribution by sex, skin color, and age is shown in Table 1. The remaining 9.7% were either refusals or individuals who could not be found at home after three separate attempts.

Prevalence of hypertension was 19.8%, or 328 subjects, of whom 68% ignored their condition and 32% were aware of their diagnosis. Diagnostic criteria and distribution thereof in the sample are shown in Table 2. Characteristics of the hypertensives in terms of sex, age, and race are shown in Table 3.

Table 4 shows that a small proportion of the subjects belonged to higher socioeconomic strata, while most belonged to underprivileged strata. Regarding schooling, 20% were illiterate and only 10% had completed secondary school.

Figure 1 shows that two-thirds of the hypertensives were aware of their status and that more than half were taking antihypertensive medication, but that only one-third had their blood pressure under control.

Antihypertensive medication was being prescribed for 62% of the hypertensives. Some 81% were on diet restrictions, and 57% had been advised to lose weight.

The following risk factors for cardiovascular diseases were studied: paternal and maternal history of hypertension, smoking, alcohol consumption, additional use of salt on cooked food, obesity, and sedentary life style. Obesity, alcohol consumption, and sedentary life style had high frequencies among the hypertensives (Table 5). However, these risk factors were not commonly addressed by the attending physicians. Of the hypertensive patients under medical care, about 92% had been advised to reduce salt intake and 81% to eat less fat. Still, weight control had only been recommended for 57% of the patients and physical exercise for 42%. Among the smokers, 34% had been advised to quit and 37% to reduce; thus, about 30% of the smokers had received no advice at all (Table 6).

Evaluation of target organs was checked by asking patients whether they had done the following tests: electrocardiogram, heart X-ray, funduscopy, serum creatinine, and urea. Figure 2 shows that funduscopy, a simple and useful exam, had been performed on only 46% of the patients.

Associations were sought between controlled blood pressure and the patients' sex,

Table 1

Proportion of subjects studied according to sex, skin color, and age. Pelotas, Brazil, 1992.

Variable	Proportion of the sample (%)
Sex	
Females	56.5
Males	43.5
Skin color	
White	81.4
Black or mixed	18.6
Age in Years	
20 - 29	24.3
30 - 39	28.3
40 - 49	19.4
50 - 59	17.2
60 - 69	10.8

Table 2

Number and proportion of hypertensive subjects according to diagnostic inclusion criterion. Pelotas, Brazil, 1992.

Inclusion criteria	n	%
Diastolic hypertension only (95 mmHg)	116	36
Systolic hypertension only (160 mmHg)	18	5
Systolic and diastolic hypertension	91	27
Normal blood pressure under regular antihypertensive treatment	103	32
Total	328	100

Table 3

Distribution of hypertensive subjects according to sex, age, and skin color. Pelotas, Brazil, 1992.

Characteristic	n	%
Sex		
Males	131	40
Females	197	60
Skin color		
White	246	75
Black or mixed	82	25
Age in Years		
20 - 29	9	3
30 - 39	42	13
40 - 49	89	27
50 - 59	105	32
60 - 69	83	25
Total	328	100

Table 4

Distribution of hypertension according to social class and schooling.
Pelotas, Brazil, 1992

Hypertension	%
Social class according ABIPEME	
A (highest) and B	7
C	18
D	39
E (lowest)	36
Schooling in Years	
Zero	20
1 – 4	29
5 – 7	27
8 – 10	10
11 – 17	14
Total	100

Figure 1

Distribution of 328 hypertensives according to awareness of the problem, to use of medicines and to blood pressure control. Pelotas, Brazil, 1992.

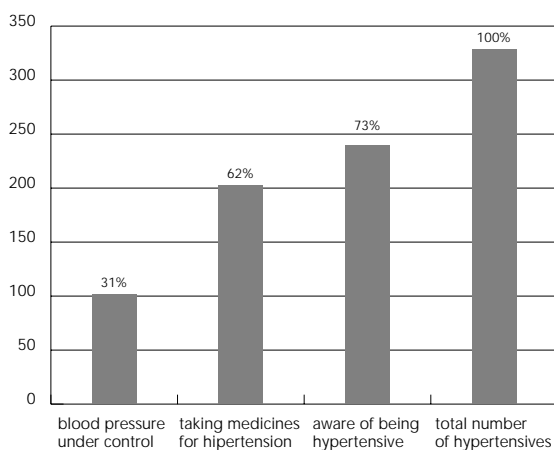


Table 5

Distribution of risk factors among hypertensive subjects. Pelotas, Brazil, 1992.

Risk factor	n	%
Sedentary life style	220	67
Obesity	181	55
Alcohol use	140	43
Maternal history of hypertension	142	43
Smoking	93	28
Paternal history of hypertension	85	26
Use of additional salt on cooked food	16	5

age, smoking, distance from clinic, and continued care by the same physician. Only the latter showed a significant association ($p = 0.05$): not having continued care entailed a relative risk of 1.35 (CI 95% = 1.02-1.71) for uncontrolled hypertension.

Information was gathered on the social repercussions of hypertension in this sample. The results were striking, especially regarding absenteeism (12%), reduction of work load (21%), and early retirement due to hypertension (6%) (Table 7).

Discussion

This study's cross-sectional design gave it a number of advantages, i.e., it was population-based, low-cost, and quick to perform. The proportion of losses and refusals was less than 10% and the measurements were performed with a standardized procedure. Inter-observer variability was checked regularly.

Further results of this study (Piccini & Victora, 1994) showed that the following variables were significantly associated with hypertension after adjustment for confounding variables: black skin color, advanced age, low educational level, paternal and maternal history of hypertension, use of additional salt on cooked foods, and obesity. The strong association between social class and hypertension as displayed by the bivariate analysis was reduced in the multivariate analysis after adjustment for age, sex, and skin color. The present article focuses on hypertensive individuals and their management.

Seventy per cent of the hypertensives were between 30 and 59 years of age, a highly productive period of life. One-fourth had been absent from work at least once in the previous year because of their condition. Even more striking was the fact that a third had reduced their work load and 10% had gone into early retirement. This confirms the major socioeconomic impact of hypertension.

With the exception of the use of additional salt on cooked food, the other risk factors studied were present in a third to a half of the hypertensives in our sample. Except for family history of hypertension, all other risk factors studied can be modified by medical advice. It is surprising that preventive measures such as exercise, losing weight, and stopping smoking were approached with only about 50% or fewer of the patients.

Fundoscopy had been carried out in less than half of patients in clinical care for hyper-

tension; this is a remarkably low figure considering that this test is part of the adequate physical evaluation of the disease. Other tests were performed more often, including X-rays and ECG.

Two-thirds of the hypertensives were aware of their condition and 60% were taking antihypertensive medication, but only one-third were controlled. These results are above the "law of halves" commonly mentioned in the literature (Pedoe, 1982), namely, that one half of hypertensives know their condition, one half take medication, and one half of the latter are controlled.

A finding which deserves special attention is the association between continued clinical care by the same physician and controlled hypertension. This is particularly relevant for developing countries, where government services often fail to provide personalized, continuous care and shifting around from one physician to another is often the rule.

In summary, the present study documented the relevance of hypertension as a public health problem with marked social repercussions in an urban area from a less developed country. Important shortcomings were detected regarding the clinical examination of hypertensives, management of risk factors, and control of blood pressure levels.

The present data should stimulate health care providers and policy-makers to improve screening and continued care to these patients.

Surveys such as the present one, carried out over a short time span and involving low costs, may prove to be extremely useful for assessing the prevalence of hypertension and the quality of its management on a community basis.

Figure 2

Distribution of hypertensives according to selected diagnostic examinations. Pelotas, Brazil, 1992.

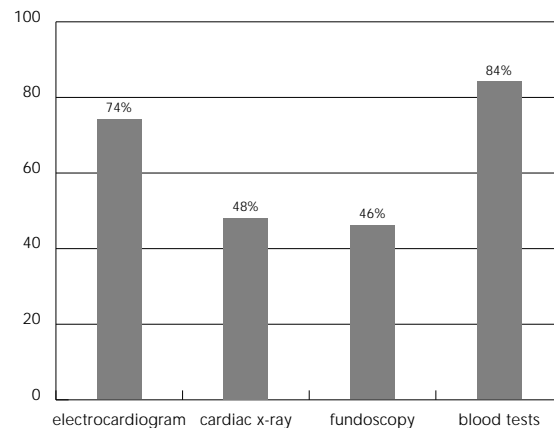


Table 6

Clinical advice to hypertensive subjects about management of risk factors. Pelotas, Brazil, 1992.

Advice given	%*
Reduce salt intake	92
Reduce fat intake	81
Lose weight	57
Do physical exercise	42
Stop smoking	37**
Reduce smoking	34**

* Hypertensive subjects who did not seek clinical care were included.

** Analyses restricted to smokers.

Table 7

Social repercussions of hypertension. Pelotas, Brazil, 1992

Repercussions	n	%*
Work load reduction	68	21
Any absence from work last year	38	12
Change of work style	16	5
Early retirement	18	6
Hospitalization last year	13	4

* n = 328

References

- AMERY, A.; BIRKENHAGER, W.; BRIKKO, P.; BULPITT, C.; CLEMENT, D.; DERUYTTERE, M.; DE SCHAEPDRYVER, A.; DOLLERY, C.; FAGARD, R.; & FORETTE, F. 1985. Mortality and Morbidity Results from the European Working Party on High Blood Pressure in the Elderly Trial. *The Lancet*, 1(8442):1349-1354.
- BRONFMAN, M.; & TUIRAN, R. A. 1984. La desigualdad ante la muerte: clases sociales y mortalidad en la niñez. *Cuadernos Médico Sociales*, 29-30: 194-198.
- COSTA, E. A. 1983. Hipertensão arterial como problema de massa no Brasil: caracteres epidemiológicos e fatores de risco. *Ciência e Cultura*, 35:1642-1649.
- CRUICKSHANK, J. M.; THORP, J. M.; & ZACHARIAS, F. J., 1987. Benefits and potential harm of lowering high blood pressure. *The Lancet*, 1(8533):581-584.
- DEAN, A. G.; DEAN, J. A.; COULOMBIER, D.; BRENDEL K. A.; SMITH, D. C.; BURTON, A. H.; DIKICER, R. C.; SULLIVAN K.; FAGAN R. F. & ARNER, T. G., 1994. *Epi Info, Version 6: a Word Processing Database, and Statistics Program for Epidemiology on Microcomputers*. Atlanta: Centers for Disease Control and Prevention.
- DUNCAN, B. B., 1991. *Desigualdades Sociais na Distribuição de Fatores de Risco para Doenças não Transmissíveis*. Tese de Doutorado, Porto Alegre: Faculdade de Medicina, Universidade Federal do Rio Grande do Sul.
- EGRET (Epidemiological Graphics, Estimation, and Testing Package), 1988. Washington: Statistics and Epidemiology Research Corporation.
- GILL, J.S.; ZEZULKA, A.V.; BEEVERS, D.G.; & DAVIES, P., 1985. Relation between initial blood pressure and its fall with treatment. *The Lancet*, 1(8428): 567-569.
- HDFPCG (Hypertension Detection and Follow-Up Program Cooperative Group), 1982. The effect of treatment on mortality in mild hypertension. *New England Journal of Medicine*, 307:976-980.
- LOMBARDI, C.; BRONFMAN, M.; FACCHINI, L. A.; VICTORA, C. G.; BARROS, F. C.; BERIA, J. U.; & TEIXEIRA, A. M. B., 1988. Operacionalização do conceito de classe social em estudos epidemiológicos. *Revista de Saúde Pública*, 22:253-265.
- MC (Management Committee), 1980. The Australian therapeutic trial in mild hypertension. *The Lancet*, 1(8158):1261-1267.
- MILLAR, W. J. & STEPHENS, T., 1987. The prevalence of overweight and obesity in Britain, Canada, and the United States. *American Journal of Public Health*, 77:38-41.
- MS (Ministério da Saúde), 1992. Dez principais óbitos por região, Brasil: 1977 a 1988. *Informe Epidemiológico do SUS*, 1:91-142.
- NORUSIS, M. 1986. *SPSS/PC+*. Chicago: SPSS Inc.
- PARTY, M.R.C.W., 1985. MRC trial of treatment of mild hypertension: principal results. *British Medical Journal*, 291:97-104.
- PEACH, H. & HELLER, R. F., 1984. *Epidemiology of Common Diseases*. London: Heinemann Medical Books Limited.
- PEDOE, H. T. 1982. Hypertension. In: *Epidemiology of Diseases* (D.L. Miller & R.D.T. Farmer, ed.), pp. 122-135. London: Blackwell Scientific Publications.
- PICCINI, R.; VICTORA C. G., 1994. Hipertensão arterial sistêmica em área urbana no sul do Brasil: prevalência e fatores de risco. *Revista de Saúde Pública*, 28: 261-267.
- SAUDERS, J.B., 1980. Alcohol: an important cause of hypertension. *British Medical Journal*, 294:1045-1046.
- SAVER, B. G.; REENTS, S.; SHEA, S.; ELRICH, M. H. & FRANCIS C. K., 1982. Predisposing Factors for Severe, Uncontrolled Hypertension in an Inner City Minority Population. *New England Journal of Medicine*, 306:776-781.
- THE LANCET, 1985. Treatment of hypertension: the 1985 results (Editorial). *The Lancet*, 2(8456):645-647.
- WEINBERGER, M. H.; COHEN, S. J.; MILLER, J. Z.; LUFT, F. C.; GRIM, C. E. & FINEBERG, N. S., 1988. Dietary sodium restriction as adjunctive treatment of hypertension. *Journal of the American Medical Association*, 259:2561-2565.