

High Blood Pressure Diagnosis and Treatment: Consensus Recommendations vs Actual Practice

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Abstract: Diagnostic and treatment practices of institutional facilities treating high blood pressure in New York City were surveyed by mail in 1978. Respondents were adhering to the treatment recommendations of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure. Ninety-two per cent of respondents reported 90-104 mm Hg as the diastolic blood pressure level at which drug therapy was initiated, indicating a more aggressive approach than was warranted by the information available at the time of the survey. (*Am J Public Health* 1981; 71:413-416.)

In 1976, the New York Heart Association surveyed all facilities in New York City that provided detection and treatment services for hypertension.¹ Included in the results was the finding that most facilities initiated treatment for high blood pressure at blood pressure levels below 105 mm Hg.

Early in 1977, the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure published consensus guidelines for patient management, representing a unique example of the dissemination of governmental recommendations for the diagnosis and treatment of a medical disorder.

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The New York Heart Association therefore conducted a repeat survey in September 1978. The results provide an opportunity to assess the impact of authoritative national recommendations on the patterns of behavior of providers in health care facilities.

Methods

A list of facilities believed to include all those which provided diagnostic and/or treatment services was compiled. Surveys were mailed to 85 facilities and responses were received from 64 (75 per cent) institutions which included clinics, industrial settings, Health Insurance Plan (HIP) offices, treatment and diagnostic centers licensed by the State of New York, and private diagnostic clinics.*

Results

Ninety-two per cent of the respondents reported that anti-hypertensive medications were prescribed for adults with sustained levels of diastolic blood pressures between 90-104 mm Hg (Table 1).

More than 80 per cent of the respondents included elevated systolic pressure and target organ damage as factors influencing the decision to initiate medication. A family history of the complications of hypertension was an influencing factor for 64 per cent of the respondents. Ninety per cent of general medical clinics replied that they considered the fam-

*Of the 64 respondents, 38 (59 per cent) were hospitals, eight were industrial settings, five were Health Insurance Plan groups, 12 were free standing treatment and diagnostic centers, and one was a private ambulatory care facility. Twenty-three responses came from hypertension specialty clinics and 21 came from general medical clinics. The remainder were from group practice settings, free standing ambulatory services, or industrial services.

TABLE 1—Responses to Hypertension Treatment Survey

	% Responding in Each Category		
	% of Total Respondents: N = 64	% of Hypertension Clinics N = 23	% of General Medical Clinics N = 21
Level of sustained diastolic blood pressure elevation at which anti-hypertensive medications are ordinarily started for adults:			
90- 94 mm Hg	31	39	29
95- 99 mm Hg	42	43	40
100- 104 mm Hg	19	4	24
105+ mm Hg	6	9	5
Other	2	4	0
Decision to initiate therapy is affected by:			
Elevated systolic pressure	81	83	90
Target organ damage	86	78	90
Family history of complications of hypertension	64	52**	90
Male sex	42	35	57
Smoking habit	47	35	52
Elevated blood cholesterol	45	35	43
Diabetes mellitus	52	39	57
Obesity	50	43	52
Race of patient	48	39	71
Medication is prescribed for sustained, isolated systolic blood pressure elevation (normal diastolic pressure)	61	61	62
The following non-drug therapeutic approaches to blood pressure reduction are used:			
Dietary sodium restriction	94	91	100
Weight reduction	97	91	100
Programmed relaxation	16	17	10
Meditation	5	4	5
Choice of specific medication is affected by:			
Age	66	52	76
Sex	38	30	43
Race	33	26	33
Renin level	45	43	33
The type of medical criteria for anti-hypertensive treatment:			
Established protocol	20	35*	5
Generally adhered to policy	20	22	29
Treating physician's decision	44	30	48
Other (combinations of above)	16	13	18

**P < .025

*P < .05

ily history of complications of hypertension to be an important factor as compared to 52 per cent of hypertension clinics.

Less than one-half of the facilities indicated that smoking habits, male sex, elevated blood cholesterol, race, and diabetes mellitus were factors which influenced their decisions to initiate therapy. Sixty-one per cent of respondents indicated that medication is prescribed for sustained isolated

systolic blood pressure elevation. Virtually all respondents replied that dietary sodium restriction and weight reduction were included as blood pressure control measures, while 16 per cent reported the use of programmed relaxation.

Almost all (83-100 per cent) of the responding institutions used the following tests as part of an initial workup (Table 2): electrocardiography, complete blood count, urine analysis, blood urea nitrogen, serum potassium, uric acid,

TABLE 2—Diagnostic Tests Routinely Performed

The following tests are performed as part of the initial minimal diagnostic investigations for an adult with sustained hypertension and with an otherwise unremarkable history and physical examination:

Test Performed	Total (N = 64)	% Responding "Yes" (Hospital Facilities)	
		Hypertension Clinics (N = 23)	General Medical Clinics (N = 21)
Electrocardiogram	97	96	100
Complete Blood Count	95	100	100
Urinalysis	100	100	100
Blood Urea Nitrogen	98	100	95
Serum Potassium	98	100	100
Uric Acid	91	96	90
Chest Radiograph	88	87	100
Serum Creatinine	83	91	90
Serum Cholesterol	95	96	95
Triglycerides	67	61	67
Urine Vanillylmandelic acid or equivalent	23	22	19
Plasma Renin	9	9	0
Intravenous Pyelography	16	13	19
Urine Culture	20	26	24
Aldosterone	6	4	5
Cortisol	5	0	5
T ₄ and/or T ₃ Ratio	16	4	10

*There were 20 non-hospital treatment facilities for which data are not presented in this table.

chest radiograph, serum creatinine, and serum cholesterol. Approximately two-thirds routinely determined serum triglyceride levels and 23 per cent did urine vanillylmandelic acid (VMA) determinations. Sixteen to 20 per cent of facilities reported the routine performance of intravenous pyelography and urine cultures. Few centers determined plasma renin, aldosterone, cortisol, or T₄-T₃ levels. There were no important differences between the responses of the hypertension specialty clinics and the general medical clinics.

Discussion

The 1977 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC) was a result of a consensus of organizational representatives serving on a committee of the National Institutes of Health.²

The practice policies of the respondents to this survey generally coincided with the JNC recommendations concerning the stepwise approach to drug therapy and diagnostic investigations, except for a tendency toward the more frequent use of intravenous pyelography, VMA determinations, and urine cultures.

The JNC report recommended that virtually all patients with diastolic blood pressures of 105 mm Hg or greater should be treated with anti-hypertensive drug therapy. It was recommended that persons with diastolic pressures of

90-104 mm Hg, ("mild" hypertension) receive individualized approaches with consideration to be given to weight control and reduced salt intake.**

Ninety-two per cent of respondents in the current survey indicated that they routinely initiated anti-hypertensive drug therapy at diastolic blood pressure levels between 90-104 mm Hg. At the time of this survey, common medical practice therefore represented an approach more aggressive than could be justified by the then available evidence concerning the relative benefits and hazards of treating mild hypertension.

The finding in our earlier survey, in 1976, that most New York facilities were vigorously treating hypertension, may indicate that the educational publicity around this issue appropriately influenced modes of treatment. Our present survey demonstrates that the 1977 report of the Joint National Committee, which recommended a more conservative and individualized approach to the treatment of mild hypertension based on the information available at that time, did not result in adherence to the more stringent blood pressure criteria for initiating therapy.

Since this survey was completed, the Hypertension Detection and Follow-Up Program (HDFP) published results showing a significant reduction in the mortality of "mild" hypertension. The results of the HDFP lend support to the contention that mild hypertension should be treated. This position was apparently accepted by the surveyed respondents prior to the publication of the new evidence.

The consensus of authorities is increasingly being offered as guidance for medical practice. The evidence here suggests that such recommendations may be incompletely or unevenly heeded by practitioners. It would therefore be desirable to know what factors influence the responses of physicians to particular medical advice.

These results should be extrapolated with caution. They are based on data obtained in a mailed survey unconfirmed by independent verification. Moreover, at best they can reflect practice for only that 20 per cent of patients treated in hospital facilities. However, because these findings are consistent with previous observations in this community, and with other nationally collected data culled from private practice physicians,³ they merit attention by health planners.

REFERENCES

1. Alderman M, Rafter J, Samet R, *et al*: High Blood Pressure Treatment Facilities. *NYS J Med* 1979; 79:754-757
2. Report of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure: A Cooperative Study. *JAMA* 1977; 237:255-261.
3. U.S. Department of Health, Education, and Welfare: Diagnosis and Management of Hypertension. A Nationwide Survey of Phy-

**The report suggested that factors which should influence the decision to begin drug treatment at such diastolic blood pressure levels should include elevated systolic blood pressure, the presence of target organ damage, a family history of the complications of hypertension, male sex, smoking habits, elevated blood cholesterol, and diabetes mellitus.

- sicians' Knowledge, Attitudes and Reported Behavior. DHEW pub. no. (NIH) 79-1056, 1979.
4. Five-Year Findings of the Hypertension Detection and Follow-Up Program. I. Reduction in mortality or persons with high blood pressure, including mild hypertension, Hypertension Detection and Follow-Up Program Cooperative Group. *JAMA* 1979; 242:2562-2571.
 5. Five-Year Findings of the Hypertension Detection and Follow-Up Program. II. Mortality by race, sex and age, Hypertension Detection and Follow-Up Program Cooperative Group. *JAMA* 1979; 242:2572-2577.

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Does Visiting the School Health Room Teach Appropriate or Inappropriate Use of Health Services?

Children's Use of School Health Rooms

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Abstract: This study examines the school health room visiting behavior, over two school years, of a random sample ($N = 671$) of urban children, grades K-5. Excluding eight students who visited regularly for medication (and who alone accounted for 25 per cent of all visits), 94 per cent of the students made at least one visit. Girls visited more frequently than boys (5.1 visits/year vs 4.1 visits/year). Girls were more likely to be in the frequent visitor group ($P = 0.01$); to have presented five or more different complaints ($P = 0.02$); and to have visited for stomachache ($P \leq 0.001$). These sex differences were observed as early as first grade. Almost 58 per cent of the variance in visiting in the second year was predicted by frequency of visiting in the first year. These data raise questions about the influence of the school in either reinforcing or modifying the health services utilization behavior of individuals. (*Am J Public Health* 1981; 71:416-419.)

The potential role of the school health service in teaching children to appropriately utilize health services has been neglected. The study to be reported suggests that patterns of

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use of the school health room by elementary school girls and boys resemble health services utilization patterns of adults and that use of the school health room may provide an opportunity to favorably influence health utilization behavior.

Materials and Method

A probability sample of 25 per cent of the 4,321 kindergarten to fifth grade students enrolled in the Galveston Independent School District during the 1976-77 school year was drawn to participate in a community-wide longitudinal survey of the use of health care resources for elementary school children.^{1,2} Seventy-three per cent of the original sample completed a family demographic questionnaire and gave permission for periodic review of their child's school records and community medical care provider's records for the study period. The 671 children who were enrolled in the school district from 1976 to 1978 formed the study population for analysis of two years of school health room visiting behavior. Sex, ethnic, and socioeconomic characteristics of the total school population, the first year study population, the students who left the district, and the final two-year study population are comparable.* The demographic characteristics of the 357 boys and 314 girls followed for two years are: 43 per cent Black, 30 per cent Mexican-American, 27 per cent Anglo-American, and 1 per cent other. As determined by reported education and occupation,³ 8 per cent of the population are in the top two Hollingshead SES groups, 14 per cent in SES III (middle), 30 per cent in SES IV (low middle), and 48 per cent in SES V (low).

*Tables presenting these data are available on request to the authors.