PRIMARY HYPERTENSION - DISEASE ANALYSIS AND TREATMENT EVALUATION

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Introduction

To get some perspective of what high blood pressure is and what it means, it is important to look at the causes of death in this nation. Over 67% of the deaths are due to diseases of the cardiovascular system. By far the majority of the cardiovascular diseases that cause these deaths are heart attacks and strokes (WHO, 1990). Therefore this is a disease possessing all of the dimensions of an epidemic. The primary task in preventing this epidemic is to identify those individuals who carry risk factors for developing cardiovascular disease. One major risk factor is high blood pressure. If treated adequately and continuously, it is the one risk factor against which one can demonstrate significant protection from heart failure and stroke. However, the Framingham study has shown that 50% of hypertensives are unknown, only 50% of the known group are treated and of these, only 50% are treated adequately (Kannel, 1975). Screening for hypertension is also of major importance since the condition is generally asymptomatic, but when adequately diagnosed and treated, some of the risks can be reduced. The significance of such a programme is revealed by a nationwide population survey in relation to the WHO-MONICA project (Cacciottolo, 1985). Hypertension was found to have a prevalence of 26% in the Maltese population. However only 7.5% were receiving treatment and just 2.5% had their blood pressure adequately controlled. Clearly there is ample motive to study the process of care for patients with primary hypertension.

This disease affects as much as 95% of all patients with high blood pressure. The aim of this thesis is to assess the investigation, treatment and monitoring of primary hypertension within hospital care. The study took the form of an audit and was based at the Outpatient Department, St Luke's Hospital.

Methodology

Epidemiology of Primary Hypertension

The first survey investigated the prevalence of high blood pressure. This involved a random sample (n=119) of the Maltese population who attended the Out-patient Department. The minimum age was set at 35 years. For each individual, blood pressure was measured on the right arm, with the subject in the sitting position and after at least five minutes of rest. A mercury column sphygmomanometer was used and two consecutive observations of systolic blood pressure (SBP) and diastolic

blood pressure (DBP) were recorded to the nearest 2mm Hg. The beginning of Korotkoff phase V was used to determine the DBP. The criteria used for defining hypertension were a SBP of or above 160mm Hg and/or a DBP of or above 95mm Hg. Systolic blood pressures between 140 and 160mm Hg and/or diastolic blood pressures between 90 and 95 mm Hg were considered as indicative of borderline hypertension. In addition, the individuals taking part in this study were screened both for awareness and treatment of hypertension.

Patient Care Assessment

The aim of this second study was to examine the technique, degree and quality of control of high blood pressure in known hypertensive individuals receiving antihypertensive drug therapy. A random sample (n=100) of medical files of patients diagnosed with primary hypertension were utilized. Relevant information was selected using a data collection flow sheet for every file. Criteria assessed were the clinicians' inquiry into medical and drug history, patient examination during initial clinical appointments and also throughout the follow-up phase, frequency of essential laboratory tests and radiology, blood pressure control and its management according to risk factors, prognosis, follow-up intervals and referral for specialised care. Assessment of drug therapy included the monitoring of current therapeutic regimen for inappropriate doses or frequency, drug interactions, contraindications, side effects and allergies. In addition, repeat prescribing with medical evaluation, as well as choice of antihypertensive treatment were also assessed.

Results

Survey 1

The mean systolic blood pressures for the representative sample of the segment of Maltese community under observation were 131mm Hg (SD 23.2) for males and 133mm Hg (SD 18.3) for females. With regard to diastolic pressure, the means were 80mm Hg (SD 11.7) for males and 77 mm Hg (SD 12.1) for females. Table 1 shows that the highest mean SBP levels for males and females occurred in two different age groups. The highest mean SBP for males was found in the older age group (75-84) years, while for females, this mean occurred in the age group (55-64) years. In the age group (75-84) years the mean SBP was consistently lower in females, which relationship was reversed in the preceding age group (65-74) years. This was in marked contrast with the relationship

of DBP variation over the years between the sexes, where the mean DBP was consistently higher in males up to the age group (65-74) years and subsequently levelled off. This observation in the Maltese population is consistent with observations in Maltese (Cacciottolo, 1989) and other populations (Tuomilehto, 1987), though at a subsequent age group 16 years later. There was no gradual rise in the slopes of both SBP and DBP over the years of age. This is inconsistent with previous observations in the Maltese population (Cacciottolo, 1989). Of great significance is the male age group (75-84 years) which exhibited a mean SBP of 168mm Hg, thus being hypertensive by WHO standards. Also of particular importance is the (35-44) year age group of both sexes which presented with the higher mean SBP, the female group sharing this reading with the oldest age group of the same sex.

Table 1: Epidemiology of Primary Hypertension

n = 119

| Age Range | SYSTOLE in mm Hg | | | | DIASTOLE in mm Hg | | | |
| | Males | | Females | | Males | | Females | |
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
35-44	121.8	9.0	123.7	12.3	83.1	7.5	82.5	7.5
45-54	115.7	10.9	126.4	21.1	80	9.6	78.2	10.6
55-64	136.9	20.6	148.1	16.2	82.1	12.6	77.5	12.2
65-74	134.7	23.3	137.5	18.3	74	12.8	73.8	11.4
75-84	168	27.2	132.5	17.7	81	10.2	82.5	10.6
35-84	131	23.2	133	18.3	80	11.7	77	12.1

In the population sampled, 29% were found to be hypertensive while 19% were previously aware of this fact. Of these patients, 14% were receiving antihypertensive treatment but only 5% were adequately controlled.

Survey 2

At the 'induction Phase', 39% presented with a history of cardiovascular disease, of which 33% reported a previous history of primary hypertension. Of these, 31% were known hypertensives and all were receiving antihypertensive drug therapy. For the other 69%, the blood pressure had to be verified, but 33% did not undergo repeat blood pressure measurement on at least 2 different occasions, in line with WHO standards. On examination, 24% were obese. Record of smoking habits were found in 38% of the medical histories, while 59% contained information on alcohol intake. Physical examination revealed that 40% were experiencing chest pain with/without exercise. Whereas 62% of the records had no evidence of inquiry on respiratory abnormalities and 22% were receiving Beta-blockers, which are contra-indicated in such cases. Just 4% noted the patient's position during blood pressure measurement. Of significance is the early examination of the fundi, which reveal the extent of accelerated vascular damage. However only 24% of the histories showed record of fundal examination. For half of the patients left ventricular hypertrophy was not investigated since no chest X-ray was done. In addition 71% of the records did not contain any information on previous medication other than antihypertensives. Total serum cholesterol level remained unknown in 76% of the patients, whereas renal function was assessed in 26% only. A disturbing 9% did not undergo any essential tests at all.

During the follow-up period, the number of patients without basic biochemical tests increased to an alarming 21%. Evaluation of risk factors were omitted from more than two-thirds of the case histories. Screening for drug sensitivity reactions were found in 59% of the records. Prevalence of hypertensive systole was 45% while uncontrolled diastole accounted for 51% of the patients. Borderline hypertension was recorded for 41% at systole and 28% at diastole (Table 2).

A total of 46% were referred for organ damage, of which 30% had uncontrolled hypertension. The major reason for referral was by far, uncontrolled hypertension, at 50%. Cardiac involvement account for 55% of the patients diagnosed, the most common being myocardial infarction (29%) and ischaemic heart disease (10%). Diagnosis of cerebral complications was made in 17%. In addition, by WHO standards, 63% had organ involvement, ranging from left ventricular hypertrophy and proteinuria, to myocardial infarction and stroke.

Table 2: Control of Hypertension in patients receiving antihypertensive drug therapy
(n=100) Figures shown as percentage

Age Range /years	35 to 54			55 to 74			75 and over					
Sex and Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Overall Male Total %	Overall Female Total %	Overall Total %
Systole /mm Hg 140	1	1	2	3	8	11	1	-	1	5	9	14
140 to 159	6	4	10	16	10	26	1	4	5	23	18	41
160 and over	2	6	8	15	14	29	3	5	8	20	25	45
Diastole /mm Hg <90	-	2	2	8	9	17	1	1	2	9	12	21
90 to 94	6	2	8	10	6	16	1	3	4	17	11	28
95 and over	3	7	10	16	17	33	3	5	8	22	29	51

In all, 31% were receiving monotherapy, but the majority (47%) received two drugs for hypertension. There were 21% with three antihypertensive agents in their regimen and 1% received four types of drugs.

First step choice of antihypertensive therapy was mostly diuresis, common in 17% and largely dominated by thiazides (hydrochloro thiazide 50-100mg dly). When these were contra-indicated, beta-blockade with atenolol (100-200mg dly) was most frequently chosen (5%). If a second agent was needed, the usually preferred combination was a diuretic with atenolol (15%) or nifedipine (10-40mg tds) in 10%. Thus, these two combinations alone accounted for 25% of the patients. Propranolol (20-40mg tds) was included as a second step choice in 16%. Third step agents used were either hydralazine (25mg tds) in 8%, or methyldopa (50-250mg tds), found in 5%. Nifedipine or verapamil (40mg tds) together with atenolol and a diuretic were also used as third step therapy, representing 6% of the records examined. In addition, 3% of the patients reported adverse drug reactions while 20% were having repeat prescriptions without medical evaluation.

Conclusion

The epidemiological survey confirmed the hypothesis and the popular impression among health professionals that hypertension is highly prevalent among the Maltese community. This signifies the importance of a screening programme which will involve health centres, pharmacists and family physicians who will collaborate with the hospital. The finding that awareness of hypertension was prevalent in 65% of all individuals suffering from high blood pressure is interesting in its implications not only to the individuals concerned, but also from the public health and health planning points of view. One reason why only 48% of hypertensives were detected, is an inadequate detecting process. Community pharmacists have a major role of great potential in this regard which is not being utilised. This also indicates the importance of setting up a national high blood pressure education programme aimed at alerting the general public to the dangers of high blood pressure and the beneficial effects of therapy. Specially trained pharmacists can play a significant role through their close contact with the community.

Results from the second study suggest the need for improvement in care of patients with primary hypertension on the medical, social and administrative fronts. The main medical problem is the need to achieve better control of blood pressure. Uncontrolled blood pressure is likely to

lead to disaster and this needs to be more widely appreciated. Serious deficiencies in care were also found, which suggest that a number of physicians had trouble taking basic histories and performing adequate physical examination. The problem of patient compliance and treatment is a difficult one and it is doubtful whether application of a complex multi-drug treatment schedule is practical. From the administrative point of view, better co-ordination of social and medical action might improve clinical attendance and compliance. But administrative failings are better appreciated from the poor quality of medical records. Evidently, the present case-record system points the way to improvement.

References

Cacciottolo J.M. Epidemiology of blood pressure and Hypertension in the Adult Maltese Community 1989. Maltese Med. J. No 12. Winter Issue '88/89.

Dollery C, Bulpitt C.J., Dargie H.G. The Care of patients with Malignant Hypertension 1974-75. A Question of Quality? Roads to Assurance in Medical Care. Oxford University Press.

Gordon T. Blood Pressure of Adults by Age and Sex, United States 1960,1962; National Centre for Health Statistics. P.H.S. Publications 1000, 1964 series 11 No 4.

Kannel W.B., Sorlie P. Hypertension in Framingham. In: Paul O. (eds.) Epidemiology of Arterial Blood Pressure. Stratton International, New York 1975; p. 553.

Tuomilehto J. et al. Comparison of Cardiovascular Risk factors between Eastern and Southwestern Finland in 1982. Acta.Med.Scand. 1987; 222; 389-400.

World Health Statistics Annual 1990, p. 270.