

# Hypertension

## A study in general practice

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**D**URING my work in general practice I have become interested in the condition which is known as hypertension. It was soon apparent to me that my experience of the disease in general practice was different from my understanding of the disease as taught in my student days, and from my experience as a hospital doctor. I therefore decided to make a study of the condition, as seen through the eyes of a general practitioner.

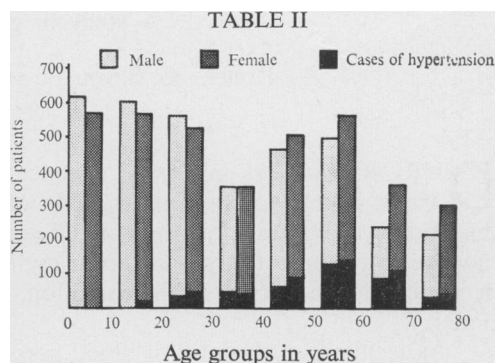
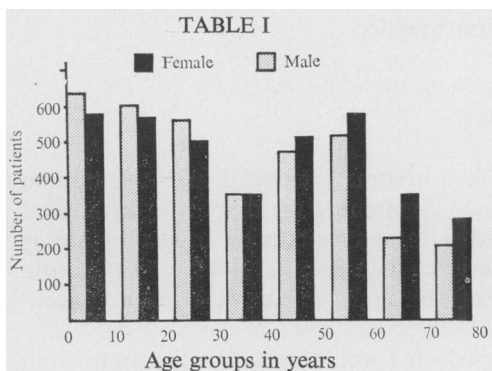
In deciding on the level of blood pressure which I would regard as the upper limit of normal, I took as my guide the comments of the World Health Organization's Expert Committee on Cardiovascular Disease and Hypertension. Their suggestion that blood pressure below 140/90 mms. Hg. is normal and above 160/96 mms. Hg. is hypertension seemed reasonable. I therefore regarded blood pressure persistently recorded at levels of 160/96 mms. Hg. and above as denoting hypertension. I have found the point at which the sounds abruptly fade the easiest to recognize and have taken this as the diastolic pressure.

In my opinion the cuff method of measuring blood pressure gives only a rough estimate, but it remains the only practical method of recording the blood pressure in clinical medicine, where an easy, painless, and repeatable method is of greater importance than absolute accuracy in a single measurement. In the practical management of hypertension provided due regard is paid to factors likely to affect the pressure, such as the doctor-patient relationship, the time of day, the position of the patient and other environmental circumstances, I find that the casual reading remains the most practical and useful. I have used the same sphygmomanometer and cuff and stethoscope at all times. I place the band firmly and evenly round the arm about three inches above the elbow, which should be quite free to move, so that I can place the bell of the stethoscope over the brachial artery in the antecubital fossa. I believe that the height of the blood pressure is not necessarily directly related to the severity and to the prognosis of the disease and I do not place a great deal of reliance on a single reading. The significance of the readings should be assessed in broad perspective. The patient is examined while he or she is reclining on an examination couch in a warm room. The room leads from the consulting room and has no direct connection with the corridor of the building, and is therefore relatively free of extraneous noise and distraction.

Over a period of eight years, from November 1958 to October 1966, all adults above the age of 20 years whom I saw in the practice, irrespective of the condition they were having treated or the reasons which brought them to seek advice had their blood pressure taken. If hypertension was suspected, the reading was checked on several occasions. Young adults aged 20 years or younger and children, had their blood pressure taken only if indicated on medical grounds or during routine examinations, as for example young women undergoing antenatal care.

An age and sex register of the practice was compiled as a general background to the study (*see* table I). This shows that in the practice there are more women than men in the older age-groups, and this illustrates the point that women live on the average longer than men. Family doctors are aware that there are more widows in their practices

than there are widowers. The fall in the number of people in the ages between 30 and 50 years reflects the effect of emigration or departure to other parts of the country by people in this age group.



On 1 October 1966 the number of people in the practice was 7,338. At that date, 2,398 had had their blood pressure recorded, during the previous eight years, comprising 33 per cent of the men over 20 years of age, a total of 829, and 59 per cent of the women over 20 years, a total of 1,569.

Using the criteria described above to denote hypertension the cases were defined and analysed. Two hundred and eighty of the 829 men and 371 of the 1,569 women examined were found to have hypertension (33.7 per cent of the men and 23 per cent of the women). The totals of the patients with diagnosed hypertension have been superimposed on the gross total of patients in the practice to give a visual indication of the relative incidence of diagnosed hypertension in each age group (*see table II*).

The reason why there are more women than men in the survey is because women have a higher rate of consultation. There is an increased incidence of diagnosed hypertension in the age groups 40–70 years and this increase occurs in both sexes. After the age of 70 there is a sudden drop in the number in both sexes, representing the general increased mortality at this age. The fall in the number of the male cases is relatively much greater than in the females, indicating the relatively greater mortality of men with hypertension and as I will show later this is not necessarily due to the effects of high blood pressure by itself.

#### Factors affecting the course of hypertension

There are several factors which I have found to influence the start, the course and the prognosis of the condition. The sex of the patient is very important. The incidence of serious illness and deaths which could be related to the high blood pressure is relatively higher in men than in women. I began this study with the conception that atheroma and hypertension were two processes of differing aetiology, and my clinical observations have tended to confirm this. Experimental evidence as well as clinical and pathological information suggests that in an adult Western society with its atherogenic diet, the onset of this type of obliterative vascular damage is hastened and its subsequent progress accelerated by persistent hypertension (Katz and Stamler 1953; Bronte-Stewart and Heptinstall 1954; Deming *et al.* 1960; Lobner 1963). In my own practice, the natural history of the hypertensive patient is often determined by the extent and the rate of development of this occlusive vascular lesion. Atheroma is much less common amongst women than amongst men which explains why coronary artery disease is more common amongst my male patients with hypertension than amongst my female patients with hypertension, and why more men than women have cardiac failure. This failure is often not related simply to the level of the blood pressure but to the onset of obliterative

coronary artery disease. Cerebral vascular accidents on the other hand, are often related to the height of the blood pressure, and therefore there is not a similar discrepancy in the incidence of this side effect between sexes (*see table III*). From my experience as a medical student and as a hospital doctor I had formed the impression of hypertension as a serious disease, carrying a bad prognosis, but my experience in general practice had led me to believe that hypertension, particularly in women and not complicated by atheroma, is a benign disease. Complications are caused by the high blood pressure resulting in cerebral haemorrhage or acute left ventricular failure.

This observation probably explains why many of my patients have had raised blood pressure for 20 or 30 years and have not come to any harm because of it. This applies to thin men and to most women. If the patient begins to show illness suggestive of atheroma such as angina of effort or intermittent claudication there is a strong possibility of a fatal myocardial infarction or crippling heart failure. Patients who have not shown symptoms of atheromatous disease of the coronary, cerebral or leg arteries occasionally present suddenly with cerebral haemorrhage and are found to have an unsuspected high blood pressure. The commonest complications, found in my practice were cerebrovascular accidents, cardiac failure and myocardial infarctions (*see table III*).

The incidence of cerebrovascular accidents in my male patients is 7.9 per cent and this is not much higher than the incidence of 6.2 per cent amongst my female patients. This is in contrast with the incidence of cardiac failure and myocardial infarctions. The incidence of cardiac failure is 10.3 per cent in my male patients compared with 2.4 per cent in my female patients. The comparison in the incidence of myocardial infarction is equally striking, being 12.5 per cent in my male patients and 3.5 per cent in my female patients.

A further indication of the influence of sex on prognosis can be seen in an examination of the deaths which could be attributed to hypertension. This is probably related to the onset of atheroma, and certainly myocardial infarction accounts for a large percentage of the male deaths (*see table IV*).

The men die more often from cardiac failure and myocardial infarction than from cerebrovascular accidents.

It is difficult to be accurate about details as patients can be unreliable in their evidence and not all relatives can be traced, nevertheless the evidence for a hereditary factor is striking. There are several families of whom I have good knowledge who illustrate the genetic factor in hypertension with the associated tendency, particularly in men, to cardiovascular complications.

TABLE III  
NATURE OF COMPLICATIONS RELATED TO HYPERTENSION

| <i>Complications</i>                    | <i>Cerebrovascular accidents</i> | <i>Cardiac failure</i> | <i>Myocardial infarction</i> |
|---|----------------------------------|------------------------|------------------------------|
| Total cases .. ..                       | 45                               | 38                     | 48                           |
| Male cases .. ..                        | 22                               | 29                     | 35                           |
| Female cases ..                         | 23                               | 9                      | 13                           |
| Percentage incidence in male cases ..   | 7.9                              | 10.3                   | 12.5                         |
| Percentage incidence in female cases .. | 6.2                              | 2.4                    | 3.5                          |

TABLE IV  
DEATHS RELATED TO HYPERTENSION

|                   | <i>Cerebrovascular accidents</i> | <i>Cardiac failure</i> | <i>Myocardial infarctions</i> |
|-------------------|----------------------------------|------------------------|-------------------------------|
| Male deaths .. .. | 9                                | 11                     | 13                            |
| Female deaths ..  | 10                               | 5                      | 8                             |

In my practice the relationship between obesity and raised blood pressure, (table V), has been particularly evident amongst the women. Obesity was considered to be present when the weight was 20 per cent or more over the expected weight for age and height according to the accepted insurance tables. Of the 280 men with hypertension, 88 were obese (31 per cent). Of the 371 women with hypertension, 149 were obese (40 per cent) and were matched with 371 who did not have hypertension for age and, as well as could be managed, for height. Of these, 49 were overweight, (13 per cent). Thus the incidence of obesity of women in my practice is three times that of those with normal blood pressure (see table V).

TABLE V  
RELATIONSHIP OF OBESITY TO HYPERTENSION

|  | <i>Total number</i> | <i>Number obese</i> | <i>Percentage obese</i> |
|--|---------------------|---------------------|-------------------------|
| Patients with hypertension .. ..       | 371                 | 149                 | 40                      |
| Patients with normal blood pressure .. | 371                 | 49                  | 13                      |

I have not found the patient's blood pressure to be affected by his or her emotional make up, nor do I think that high blood pressure is necessarily found in the excitable or nervous person. On the contrary, I have often found it to be present in the placid and unemotional type of person.

Thirty-three of my patients presented with hypertension in pregnancy. Of these 33, 18 have since had a persistently raised blood pressure. Two have died, one from malignant hypertension, coronary artery disease and renal failure at the age of 42 and the other of congestive cardiac failure at the age of 44. My observations have led me to believe that if a pregnant woman's diastolic blood pressure remains 90 mms. Hg. or below, or at most only occasionally rises a little above this, she is not likely to be in potential danger. However, if the diastolic pressure shows a steady upward trend and the last readings before delivery are constantly above 90 mms. Hg. then the incidence of proteinuria and other symptoms and signs of pre-eclamptic toxæmia increase.

### Diagnosis

Since hypertension is a common cause of premature death, its diagnosis is important. I have noted that repeated examinations of the blood pressure show that slight hypertension found under the excitement and apprehension of the initial medical examination disappears. It is important to differentiate the two main divisions of essential and secondary hypertension. The younger the patient, the more thorough should be the search for underlying causes, especially if there is no family history of hypertension. Persistence of the diastolic blood pressure at levels of 100 mms. Hg. or more in young patients merits further thorough investigation.

Secondary hypertension is most commonly due to renal disease and 16 per cent of women over the age of 40 years with hypertension gave a history of previous recurrent urinary infection, often in pregnancy. In contrast, only six per cent of women over the age of 40, whose blood pressure was normal, had a history of recurrent urinary infection. Of the 651 patients suffering from hypertension, only three had rare renal conditions. One man had bilateral polycystic kidneys and died of a myocardial infarction. A woman had hypertension secondary to injury of a kidney in her youth and another woman had had glomerular nephritis in her youth and is now in her fifties. Hypertension may be due to other rare causes, but none of these were found in my practice. In specialist clinics the proportion of rare cases is much higher.

I divide my approach to the problem of diagnosis into three sections:

#### 1. *The patient's history and symptoms*

These are often misleading and bizarre. Sometimes it is difficult to decide whether

they are due to other causes such as cerebral atheroma or an anxiety state. They cannot be directly related to the height of the blood pressure and I have often found a patient with severe hypertension who has no symptoms. Usually, however, the hypertension is found because the patient seeks advice for symptoms which are related to hypertensive cardiovascular disease. It may well be true that for every case of hypertension diligently attending a general practitioner or hospital clinic, there are two or three others of the general population unaware that their blood pressure is raised.

Doctors are not blameless in the production of anxiety neurosis with regard to raised blood pressure. I occasionally see a patient with a severe anxiety state with prominent hypochondriacal features brought on by his being told without proper explanation that he has a high blood pressure. In many cases the headaches, difficulty in concentration, irritability, impatience, sense of fatigue, dyspnoea, precordial pain, insomnia and tension which have been regarded as early manifestations of essential hypertension I now consider to be part of an anxiety neurosis. The whole range of these symptoms differs in no way from anxiety states not associated with hypertension. Because of the difficulty in analysing the significance of symptoms I find that they are not satisfactory criteria on which to base an appreciation of the degree of severity of the pathological changes caused by the hypertension. The disease process can only be assessed by a careful examination of the various systems of the body. The results of this assessment indicate whether the symptoms are due to hypertension or to an anxiety state associated with a hypertension.

Amongst my own patients I have found that the three most common presenting symptoms are headache, giddiness, and angina or breathlessness on effort (*see table VI*).

Men present with angina and breathlessness on effort slightly more often than women.

I have found that the three other ways in which hypertension is most commonly diagnosed are:

- (1) During antenatal care.
- (2) Owing to the sudden onset of serious illness in someone who was not previously complaining. Such illness is usually a cerebrovascular upset or a myocardial infarction.
- (3) As an accidental finding during a routine medical examination, for example for life insurance purposes.

Twenty-eight of my cases presented suddenly. There were 16 men (ten with a myocardial infarction, two with cardiac asthma and four with a cerebro vascular upset), and 12 women (six with, myocardial infarction, one with cardiac asthma and five with a cerebro vascular upset) (*see table VII*).

The inference to be drawn from these figures is that amongst men with symptomless hypertension, there is a greater risk of sudden cardiac upset than amongst symptomless women. Sudden onset of serious heart illness amongst women is about the same as cerebrovascular illness.

Of the 651 hypertensive patients 213 (88 men and 125 women) had no symptoms

TABLE VI  
PRESENTING SYMPTOMS

| <i>Symptoms</i>                        | <i>Male</i> | <i>Female</i> |
|--|-------------|---------------|
| Headache .. .. .                       | 33          | 58            |
| Giddiness .. .. .                      | 44          | 52            |
| Angina and breathlessness on effort .. | 110         | 104           |

TABLE VII  
MODE OF SUDDEN PRESENTATION IN CASES NOT PREVIOUSLY KNOWN TO HAVE HYPERTENSION

|                                   | <i>Males</i> | <i>Females</i> |
|-----------------------------------|--------------|----------------|
| Total cases .. .. .               | 280          | 371            |
| Sudden cardiac presentation .. .. | 12           | 7              |
| Sudden cerebral presentation ..   | 4            | 5              |

at all, and their hypertension was found accidentally. The incidence of complications which could be attributed to their hypertension is shown in table VIII. These figures suggest that there are many people with symptomless hypertension who do not seem to run any great risk from their illness. Out of the 213 patients with no previous symptoms only 35 subsequently presented with serious illness. There must be a large number of people in the community with undiagnosed hypertension (Last's clinical iceberg) and the risk of complications and death from hypertension is probably small.

## 2. Clinical signs

These are the effects which the raised blood pressure is having on the various organs of the body. The signs which the general practitioner can look for can be put into three groups. These are the effect the raised blood pressure has on the heart and blood vessels, the fundi of the eyes and the kidneys. I feel the pulse in both wrists as variations are sometimes found in the two sides both in health and in disease. The patient is resting and except for special purposes should not have been making any effort previous to the examination. In established hypertension the heart is usually found to be enlarged. The enlargement is due to either hypertrophy alone, or to hypertrophy plus the dilatation of failure. The effect of the hypertension on the fundi is then assessed. The renal findings, the presence of albumin, casts, cells or bacteria are useful. The culture of a mid-stream specimen of urine is useful, both in men and women. I do not think catheterization is really necessary if the mid-stream specimen of urine is properly collected and I do not resort to it. A specific gravity test and an estimation of the blood urea are done if thought necessary. These tests are quite sufficient, since they will show whether there is renal failure or pyelonephritis. Whether abnormalities suggestive of renal disease are contributing to the cause of the hypertension, or the result of it, is part of the problem of the diagnosis. A blood urea level of about 100 mg per 100 ml suggests a high degree of renal failure. The retinal grading and the efficiency of the heart and kidneys are the important factors in determining whether treatment is necessary, and if it is, what kind would be best.

More detailed examinations may be necessary. The two most important are intravenous pyelography and electrocardiographic examination. In young patients an intravenous pyelogram is essential. If this reveals an abnormality, further investigations are often needed, though discovery of bilateral small kidneys or polycystic kidneys may terminate the investigation. Only two of 52 patients in whom intravenous pyelogram was done were found to have a renal abnormality. Chronic pyelonephritis is the commonest cause of renal hypertension and a large number of middle-aged or elderly women who have hypertension may well have this as a cause. Certainly, many of them have a history of recurrent pyelitis, often in pregnancy and usually prior to the time when use of chemotherapy and antibiotics was started. In many people with chronic pyelonephritis it is possible to demonstrate vesico-ureteric reflux, and a micturating cystogram is now an essential part of the investigation of a patient with chronic pyelonephritis. The family doctor can take the investigation and assessment of the severity of hypertension up to the point of these detailed investigations. Access to a good laboratory makes a great difference to his ability to diagnose and assess the severity of, and treat the condition.

TABLE VIII  
COMPLICATIONS IN CASES WHO WERE FOUND ACCIDENTALLY.  
NUMBERS IN PARENTHESIS WERE THOSE WHO DIED OF THE  
COMPLICATION

|   | <i>Males</i> | <i>Females</i> |
|---|--------------|----------------|
| Developed myocardial infarction or angina .. .. . | 11 (4)       | 6 (4)          |
| Developed cardiac failure .. .. .                 | 4 (2)        | 2 (2)          |
| Developed cerebrovascular accident                | 2 (2)        | 8 (4)          |
| Developed renal failure .. .. .                   | 2 (2)        | —              |

The two main reasons for seeking the opinion of a colleague in hospital are:

- (1) The investigation of the young person with hypertension, and
- (2) when the patient's hypertension is of such a serious degree that potent drugs are thought to be necessary.

### **Treatment**

Twenty years ago there was no reliable treatment for hypertension but now the choice is wide. It can be difficult to decide which of the various drugs to use, or for that matter, whether to use any drugs at all. In my opinion the discovery of a raised blood pressure is not in itself an indication for treatment, although there is now good evidence that when the diastolic pressure is satisfactorily controlled the incidence of complications and mortality due to hypertension is reduced. The efficacy of modern drugs used to treat hypertension has increased the necessity for the family doctor to understand the physiological and pharmacological principles on which their effects depend.

The rapid improvement in the drug treatment of hypertension has been associated with a greater understanding of the aetiology of the condition. There is now a considerable amount of knowledge and a variety of treatments which offer real hope to many patients for whom nothing could have been done in the past. The management of the hypertensive patient in general practice requires not only the use of drugs, but also the management of other factors which can influence the course of the disease. The family doctor is in a favourable position to see the genetic, familial, environmental, nutritional and occupational factors which may influence the disease. The management of the hypertensive patient is not easy and the patient has to learn to live with and adapt himself to his disease. In each practice there are many patients with mild or moderate hypertension, who have little or no symptoms and who require little or no treatment. The care of the majority of these can be undertaken from the beginning and maintained throughout by the general practitioner, provided he has access to the laboratory and x-ray department. In every practice, however, there are a few patients who are ill, sometimes desperately ill, with a very high blood pressure and these patients need all the resources of modern medicine and sometimes modern surgery. Considerable care is required in deciding which remedy should be used for each patient. These remedies are powerful, their effect difficult to control and their side effects troublesome. They require the fullest co-operation between patient and doctor.

The patient must be taught to learn to live with and adapt himself to his disease. Each patient must be carefully assessed, not just with regard to his drug treatment, but also with regard to the effects that his illness and his treatment are going to have on his whole life. To the family doctor, the effect on a patient's domestic life and his working and recreational life can be of the greatest importance. An account must be taken of the age of the patient as more vigorous treatment is required and is justified in younger patients than in the elderly, whose arteries show well-marked involuntional sclerosis. This applies particularly to the state of the kidneys, for if renal function is impaired there is little or no hope of reversing the process, and hypotensive drugs can aggravate uraemia. A rise in the systolic pressure with a normal diastolic pressure is common in elderly people and I find the prognosis to be good, presumably due to the blood vessels being well-involuted and the effect on other organs appears to be very small. These patients rarely require treatment and then only with mild sedation. A sudden or excessive fall in the blood pressure of elderly people may prove upsetting and occasionally dangerous, particularly in those with atheroma. Patients are best selected for treatment on the basis of their vascular state as it affects the fundi, the heart and the kidneys. This is preferable to basing treatment on casual blood pressure readings as the blood pressure can vary from day to day, if not from hour to hour, but the changes in the vessel walls and the effects they produce are constant. In the hypertensive patient, the state of his artery walls and arterioles is more important than the height of his blood pressure.

Some patients have a significantly high diastolic pressure but no evidence of functional impairment of the heart, kidneys and fundi. Some authorities advise treatment for these patients to prevent damage to organs but others believe that the condition may remain unchanged for years and hesitate to start treatment. I am inclined to the opinion that if they have persistent symptoms such as headaches or dizziness and are showing symptoms of anxiety they are better treated with a mild sedative. Certainly, if these patients are not treated, they must be carefully watched for the appearance of impairment of function of organs. In those cases where the symptoms are attributable to the hypertension, I have found that the response, in the sense of relief of the symptoms, is very satisfactory when the blood pressure is lowered by treatment. In patients with malignant hypertension in particular, headache may be very severe and develop before the patient is aware that he has hypertension, and the response to treatment as regards relief of symptoms, can often be very gratifying.

Symptomless, uncomplicated hypertension is a difficult problem. The statistics provided by life assurance offices (Dublin *et al.* 1949) and Bechgaard's (1946) follow-up study of over 1,000 patients with hypertension have shown clearly that life expectancy diminishes with even small rises in the blood pressure and that the excess mortality is due mainly to cardiovascular and renal disease. From such data it has been argued (Stewart 1957) that hypotensive therapy should be given to symptomless patients. However, other authorities suggest that treatment of such hypertension will not necessarily improve prognosis.

That there is a definite co-relation between blood pressure and the relation of body weight to height has been found so often as to leave no room for doubt. The figures of Master, Dublin and Marks (1950) are representative. There has been a suggestion that this may be accounted for by the error introduced by varying arm circumference to which Ragan and Bordley (1941) drew attention. However, there are two reasons for supposing that the relationship between high blood pressure and obesity is more than an error in the measurement. First, reduction in weight may produce considerable falls in high arterial blood pressure. Terry (1923), Prebel (1923) and Fletcher (1954) came to a similar conclusion and showed that it was not related to diminution of arm girth. Secondly, the figures of Dublin, Fisk and Kopf (1925) show that the percentage of persons having blood pressure 20 mms Hg or more above the average for that age, increases more rapidly with age in the group which is 20 per cent or more overweight, than in those whose weight is within five per cent of the average. These two considerations reinforce the concept of obesity as a contributory factor to the development of higher pressures.

It is particularly difficult to assess the importance of obesity in hypertensive women, though a reduction in weight is usually accompanied by a fall in blood pressure. The fact that they have a greater tolerance to hypertension also makes it difficult to assess the influence of obesity in prognosis. As I have shown earlier 40 per cent of my female patients with hypertension were obese as compared with 13 per cent of a similar number who had normal blood pressure. Loss of weight was sufficient amongst many of these hypertensive patients to cause a fall in their blood pressure. Leishman (1959), in comparing treated and untreated hypertension, noted that absence of obesity was probably a bad prognostic sign, but later realized that the preponderance of patients of normal weight among the fatal cases was biased by patients with malignant hypertension, who are rarely overweight.

In the United Kingdom the most commonly used height and weight tables are those known to the insurance companies as Levine's 1922 tables. In spite of the fact that a 1959 revision is available they still tend to be used, but with a working margin of 20 to 30 per cent. In 1959 the Society of Actuaries in the United States of America published what is known as the *Build and blood pressure study* and this covers heights, weights, and mortality experience of the larger American and Canadian companies.



The data are derived from between four and five million policies followed over considerable periods. Although the results, which are of considerable interest and value, have been published in digest form in the monthly Statistical Bulletin of the Metropolitan Life Insurance Company, they do not seem generally known in Britain.

To summarize the above observations, I think that the following four groups of patients should be treated:

1. All patients showing hypertensive retinopathy; that is grade 3 and grade 4 changes.
2. Those patients who have had attacks of left ventricular failure or angina, or who have had transient cerebrovascular episodes. These patients may not necessarily have hypertensive retinopathy.
3. Those patients who are seriously disabled by symptoms such as breathlessness or headache, associated with a persistently high diastolic pressure.
4. Young patients whose blood pressure is high, even although their symptoms may be minimal or absent.

One of my main hopes in treatment is to allay the patient's apprehension and fear. By their manner, attitude and personality, some doctors are able to accomplish more than others for their patients and it is important for the doctor to establish a bond of trust with the patient, and to reassure and encourage him. I explain to him that serious complications are not common, that the condition can be comparatively benign and that suitable treatment is available when it is required. A great deal can be attained by this initial approach to the patient's illness and it can also make the subsequent use of appropriate drugs easier.

It is important not to be misled by the blood pressure readings. I never comment much on isolated readings, as the level of the mercury is often not related to the patient's state of health. However, it is important to take the patient's blood pressure at most visits as he expects it to be done and I am sure that the simple taking of the blood pressure has some therapeutic effect. It symbolizes to the patient continuing interest in his condition on the part of the doctor. The patient cares little about the state of his retinal vessels or the efficiency of his kidneys, but he is intensely interested in the height of his blood pressure. This is the crux of the problem to him and I do not think that taking the patient's blood pressure at regular intervals makes him more anxious; on the contrary, I find him more reassured and satisfied when it is recorded. Occasionally, I find it necessary to try and reorganize a patient's life, and by doing this, I hope to attain better health for him. A routine of life which includes long hours of sleep, a short mid-day rest, quiet weekends and good holidays, is much to be desired. Even in the severest cases of hypertension, the blood pressure temporarily falls during sleep, therefore it is important to make sure that the patient gets adequate rest during the night, if necessary with the help of sedatives. For the burden which is being thrown on the cardiovascular system to be relieved even for a few hours is of great benefit.

Since various dietary factors can probably influence both the level of the systemic blood pressure and its effects on the cardiovascular system, the diet deserves serious consideration when planning the management of hypertensive patients. To be successful, however, a dietary regimen must be effective, palatable, economical and flexible in order to satisfy varied tastes and budgets. Maximal adherence to prolonged dieting means that patients should firmly understand and accept that 'their diet' is nothing more than a sensible way of eating which is complementary to their other treatment.

No clear indication has been provided as to which patient is most likely to benefit from salt restriction although advancing years and a very high diastolic pressure are two factors which appear to lessen the chance of satisfactory response. Furthermore, difficulty with patient acceptance of these rigid and at times unpleasant and expensive diets was all too common. Gilchrist (1956) suggested that even in malignant hypertension nearly half the patients will show a regression of papilloedema and an improvement in eyesight when the sodium content of the diet is reduced to 200 mg a day. In

pre-eclamptic toxæmia it has been known for several years that reduction of the sodium intake has a beneficial effect on the illness.

Not surprisingly, with the development and introduction of potent hypotensive agents, interest was lost temporarily in sodium restriction as a method of treating hypertension. Renewed attention has been given to this aspect of the therapeutic problem by the extensive use of the oral diuretics which have variable hypotensive potential in association with at times, profound effects on water and sodium metabolism (Taggart 1958, Dunstan *et al.* 1959). Undoubtedly, rigid salt restriction is no longer essential and can prove dangerous if used without caution in combination with diuretics. On the other hand, with moderate restriction of salt rather than free salt feeding, the dose of diuretics and other more potent hypotensive drugs can be significantly reduced and their toxic effects appreciably lessened. This becomes particularly apparent in the presence of hypertensive heart failure. Many hypertensive patients over-eat and if this is associated with obesity then I consider it to be an indication for dieting. The prescription of an exact diet of 1,000 to 1,500 calories is the best way of doing this, with advice about the type of foods to avoid. Clinical experience also demonstrates that once hypertension is established, subsequent progress is often determined not only by hypertensive vascular disease but also by co-existing arteriosclerosis, often accompanied by atheroma. Hence any consideration of the diet in hypertension must include its possible pathogenic role as well as its therapeutic value in the management of patients whose life expectancy, according to insurance statistics is often shortened by associated obesity. Long term endeavours at lowering the plasma cholesterol and serum lipids by substitution of vegetable oils for animal fats, together with the use of cholesterol reducing drugs, such as 'atromid-s', would also seem desirable in all patients with a strong family history of atheroma, with or without biochemical evidence of hypercholesterolaemia. For many years I have noticed the correlation between an arcus senilis in middle-aged people and tendency to atheroma of the arteries. In my opinion, the presence of clinical and biochemical signs of atheroma, in association with hypertension, make a bad combination. I would now have little hesitation in putting such patients on to treatment with 'atromid-s' apart from any other measures which I may take.

Occasionally, a surgical operation may be indicated, which may be either palliative or with a view to cure although I find this to be extremely rare. Although suggested by various earlier authorities, sympathectomy as a treatment for hypertension was initiated by Rowntree and Adson in 1925. Subsequently, more extensive operations were devised by Adson, Peat, Smithwick and others. Since the powerful hypotensive drugs have become available, the operation of lumbodorsal sympathectomy has been used less and less in the treatment of hypertension. Very occasionally the operation may be indicated in young patients suffering from severe hypertension who have either not responded to hypotensive drugs or, for one reason or another, are unable to tolerate treatment with any of them. In certain hands it has been a most successful treatment. Leishman (1959) had a satisfactory fall in blood pressure in 80 per cent of the patients who underwent this operation. This good result was attributed to extensive dorsal denervation. The rarity of such operations is shown by the fact that in my practice, only one patient with hypertension had a cause which could be remedied or palliated by surgery.

The medical management of hypertension has always presented difficult problems. These have been complicated rather than simplified by the introduction of the new, potent drugs. These substances can have serious side effects which can interfere with their successful use. Fortunately, the vast majority of patients suffering from hypertension require only mild sedation. In my own practice out of 489 patients requiring medical treatment for hypertension 121 have required mild sedation only, and 40 were asked to reduce weight without drug treatment and 162 were given no treatment at all.

Arteriosclerotic hypertension is characterized by high systolic blood pressure with

normal or low diastolic readings due to increased rigidity of the aortic walls and central arteries. Treatment of these patients is rarely indicated and in my own practice rarely extends beyond mild sedation. My personal choice is phenobarbitone alone, or phenobarbitone and theobromine. This, combined with adequate rest and relaxation, and the reduction of weight where advisable, is usually sufficient, particularly for the elderly of both sexes.

When further treatment is necessary, but the need to reduce the blood pressure is not great, then treatment with a chlorothiazide or a flumethiazide derivative, or a rauwolfia preparation is indicated. Sometimes a combination of both drugs may be required. Only rarely is treatment with ganglion or adrenergic blocking drugs necessary and their use must be carefully controlled. In the early stages of treatment with these drugs doctors must be prepared to see their patients weekly and to take the blood pressure in the erect as well as the reclining position. If possible, the patient should have been standing quietly for a few minutes before the reading is made. When the pressure is well controlled and the dose of the drug adjusted, the visits can be less frequent. I have had to use the more powerful hypotensive drugs in only 23 patients. One was a man in the malignant phase of his hypertension which was secondary to bilateral disease of the kidneys. Another was a woman also in the malignant phase, the hypertension being secondary to severe eclampsia. Both these patients died. Of the other 21, 14 were women with severe benign hypertension whose symptoms were severely disabling, one was a woman who had post-nephritic hypertension and six were men with severe benign hypertension. Twenty-two of these patients have been treated with methyl dopa and two with guanethidine; one woman had both drugs.

The degree to which renal function is impaired or is decreased by hypotension with consequent reduction in perfusion pressure, constitutes the major barrier to effective results with these drugs. Only rarely can effective therapy be achieved when the blood urea is over 100 mg per cent and these drugs should be used with great caution by people who drive vehicles or operate machinery. From a general practitioner's point of view, the place these drugs have in the treatment of hypertension is small and they are required very rarely. The vast majority of hypertensive patients never require to receive such therapy (table IX).

Whatever drug or combination of drugs is used, the aim of treatment should be to maintain the blood pressure as near as possible for most of the day. This is difficult to achieve and the degree of success is dependent upon the patient's intelligence and his willingness to co-operate.

No treatment was required by 162 patients and in 40 diet alone. In general practice the ganglion blocking and adrenergic blocking drugs are rarely necessary.

TABLE IX  
TREATMENT IN MY OWN PRACTICE. MANY PATIENTS WERE TREATED WITH MORE THAN ONE DRUG

|   | Male | Female |
|---|------|--------|
| No treatment .. .. .                                    | 82   | 80     |
| Weight reduction alone .. ..                            | 15   | 25     |
| Phenobarbitone .. .. .                                  | 83   | 159    |
| Rauwolfia and its derivatives ..                        | 46   | 129    |
| Oral diuretics .. .. .                                  | 90   | 108    |
| Ganglion blocking and adrenergic blocking drugs .. .. . | 7    | 16     |

**Conclusions**

The influence of sex, heredity and obesity on the incidence and prognosis of hypertension is important. It is important to make sure that there is no underlying disease which could be an aetiological factor in the illness and primary renal disease is an

important consideration. Certain factors and groups of patients require special consideration. In the elderly, the hypertension is often mainly systolic and treatment is rarely indicated. Hypertension in the relatively young (under 45 years old) and especially in men should be carefully investigated to exclude any underlying cause, though such a cause is rarely seen in general practice. Men have a worse prognosis than women and this is related to the associated presence of atheroma.

Few patients with hypertension feel really ill, but few patients taking the more powerful hypotensive drugs feel really well, and treatment with these drugs is rarely desirable or warranted. Treatment should not be based on the level of the blood pressure, but on a careful assessment of the effect of the blood pressure on the heart, kidneys, retina and the brain. Multiple readings of the blood pressure are necessary and in my opinion are not harmful to the patient's morale, and the advantages of regular attendances for examination outweigh the disadvantages. Once the decision has been reached as to the necessity of treatment the position should be fully explained to the patient and the aim of treatment should be to achieve good control of the level of the blood pressure with the minimum of side effects. Management of the patient requires attention to many other factors apart from drug treatment.

The family doctor is particularly well placed to study this interesting and prevalent condition. He sees the patient first and is able to observe the early signs and symptoms of the illness. It is usually he who is first aware of the complications of the illness and it is almost always he who supervises the medical and nursing care of the patient in the terminal phase. Though reports from general practitioners have of necessity concerned small numbers of patients, there is scope here for larger investigations if such investigations could be done on a regional or even national basis, with large numbers of general practitioners pooling their findings.

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