Practical Office Therapy of Hypertension

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Because of the sheer number of patients and because of their location, the community practitioner is in a position to deal with the vast majority of problems that occur in hypertension. The trend in hypertension therapy is toward individualizing the work-up of the hypertensive patient, which with many patients can be very simple.

When emphasizing aspects of practical office care of the hypertensive, one of the first questions that comes to mind is: what exactly is the blood pressure?

There is not any one universally accepted definition of hypertension. Until such a one is adopted, we have put together a Medical College of Virginia definition, using the opinions of several of us in the Department of Medicine (Fig I). We use the following criteria:

1. A diastolic of 95 mm Hg. Anything greater than this is hypertension.
2. The seated posture.
3. The diastolic pressure only; not the systolic (for reasons which will be discussed later).
4. Disappearance of all sound (or phase V of Korotkoff's sounds).

Thus, hypertension is defined as any measurement that is above 95 mm Hg diastolic, in the seated posture. Sustained hypertension in our definition is three such consecutive readings, or three out of four, on an outpatient basis. This works out well in a practical way, because the first reading can be the "screening" blood pressure, the second one can be obtained during the first evaluation of the patient, and the third one is taken when the lab work has come back, and the physician is ready to make a decision about the course of treatment. Transient hypertension is hypertension that comes and goes, with normal blood pressures in between.

There are certain simple things that should be done, short of long-term therapy, and these will sometimes suffice. For instance, if a patient who is grossly obese can be induced to lose 20% or 25% body weight, often there will be a drop in the blood pressure. We have had very little success with this, unless the patient can be induced to join a group where there is high morale and a real motivation toward lowering body weight. Such a group is far superior to drug therapy. Another problem to be considered when dealing with a new hypertensive is the "cultural salt eater." There are some groups in the population that eat very salty, rich foods as a family and cultural tradition. Certain types of dishes extremely rich in salt can increase the intake to 15 to 20 gm/day. This can usually be discovered just by talking to the patient. It is not necessary to collect a 24-hour specimen for sodium excretion, though this would be a way to document it. Some of these people will have a mild drop in blood pressure when they are put on an average salt diet. This has been one of the few instances where altering the salt content of the diet has seemed useful to us in the management of uncomplicated hypertension. Rarely, a patient with severe hypertension can benefit from salt restriction. Sometimes, of course, it is necessary because of renal, hepatic, or cardiac disease.

A few comments about contraceptive pills are in order. There is an average increase in the blood pres-
HYPERTENSION: Seated diastolic blood pressure greater than 95 mm Hg in either arm. Use phase V (disappearance of Korotkoff's sounds), if IV and V differ by 4 mm, record both.

SUSTAINED HYPERTENSION: Seated blood pressure greater than 95 mm Hg diastolic on three outpatient occasions out of four at least one week apart. The pressures used may include the "screening" (or initial) pressure.

TRANSIENT HYPERTENSION: Any seated blood pressure greater than 95 mm Hg diastolic. People with transient hypertension should be treated only if appropriate, or scheduled for return appointment for B.P. check in six months.

TREATABLE HYPERTENSION: That hypertension which in the judgment of the physician carries, untreated, a greater risk than that of treatment. Near universal agreement now exists that seated diastolic B.P. greater than 104 mm Hg (sustained) requires treatment in males, perhaps females too; and that greater than 95 mm Hg diastolic (sustained) requires treatment if evidence of cardiovascular damage is present (Grade II, III, or IV fundi, left ventricular hypertrophy, evidence of cardiac decompensation, evidence of coronary artery disease). Impaired renal function, proteinuria, or hematuria are not ordinarily the result of modest elevation of blood pressure. Intermittent hypertension should probably also be treated if there is any detectable cardiovascular damage reasonably attributable to the blood pressure or if documented acute rises seem dangerous.

Fig 1—Definition of hypertension, as used at MCV/VCU.

sure of young women when they take these pills, even in what we would call the normal population (1). The order of this increase is about 14 mm Hg systolic and 8 to 9 mm Hg diastolic. It is sufficient to elevate the blood pressure into what we would call hypertension in a certain percentage of young women who take these drugs. Such patients should be advised to use other means of contraception. This is an unusual type of hypertension: it builds up slowly in weeks to months, and it lasts from four to six months after the pill is discontinued. The physician cannot simply check the patient in two to three weeks post-pill to see if the high blood pressure has gone away. There is a subtle biochemical change in the bloodstream, in which the substrate for renin is actually increased. Renin itself may rise at first, then later fall. Of course, some patients are going to have to be treated, and then have this treatment withdrawn after four to six months to see if the problem has disappeared.

Another aspect in the care of the hypertensive is the "treatment decision." This is the point at which the physician has to decide whether or not to put the patient on (usually) lifetime therapy. It is an important decision because of its implications for the patient, having to do with self-image, the expense of repeated office visits, and trouble for the doctor. Therefore, a decision is best made with all available data: several blood pressures, a history, physical examination, and whatever lab work is appropriate for that particular patient.

Figure 2 shows factors of importance in this decision. We feel that a patient should be treated on the basis of the blood pressure per se if the seated diastolic blood pressure is over 104 mm Hg. This value is from the Veterans Administration Cooperative Study (2). We should recognize that their study involved middle-aged men only. There were no females. The evidence for treatment is not quite as strong for females, but most authorities in this field feel that women ought to be included in this group, and that treatment is indicated (on blood pressure alone) above 104 mm Hg diastolic pressure. This may change as larger and larger populations are studied in the future.

Below 104 mm Hg but above 95 mm Hg, we feel that an individualized decision is best. Various ways of arriving at this have been advanced. Some physi-
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cians even have a “point system” that adds up “points” for the various factors. Such things considered are age (young), sex (male), race (black), family history (early occurrence of vascular diseases or hypertension), increased cholesterol, and cigarette smoking. If cardiovascular damage can be detected during evaluation of the patient, the likelihood of further damage from hypertension is increased. Such damage might show up as retinal findings, on the electrocardiogram (left ventricular hypertrophy), and so forth. In short, any evidence of cardiovascular damage due to hypertension is thought to increase the patient’s risk for uncontrolled hypertension and would be sufficient to put him in a “treatment” category, if the diastolic is above 95 mm Hg.

As to plasma renin, the postulate has been advanced that “low renin hypertension” carries a low risk. A few have even gone so far as to speculate that perhaps these patients should not be treated at all. We are not using renin for this purpose. The finding of “low risk” associated with “low renin hypertension” has been contradicted in a number of studies, and the matter is, frankly, controversial (3).

The therapeutic aim of office management of chronic hypertension is reduction of the blood pressure to normal. This tests the staying power of the doctor and patient alike as usually it involves a lifetime of therapy.

The problem of the “missing” patient (non-compliance) is a very difficult one and there is no ideal answer. We send out a lot of letters (saying, “where are you?”) and an appointment card requesting the patient to come back in. A one-to-one relationship with the physician helps, and the interest the doctor shows in treating the blood pressure, and his interest in the patient, is most important. It has also been shown that the one-to-one relationship need not be with a physician (4). In large complex clinics, where there is a shifting physician population, it has been shown that a well-trained nurse (or paramedical personnel) can take over this role, with the physician then supervising the medical decisions to make sure that these are appropriate. In most circumstances, however, it is the physician who has to build this one-to-one relationship with the patient.

The patient ought to know the names of the drugs being used for treatment, their chief side effects, and the bottles ought to be labeled. This procedure is useful for most patients, although there will be some obvious exceptions. In terms of patient education, there are recent efforts to produce audiovisual or tape cassette aids for the patient. I have not yet heard of one that I thought was good enough for general use. Some are under development in the American Heart Association and will be available through local chapters in late 1975. A physician who sees a large number of hypertensive patients may want to tape a brief discussion of the condition for the benefit of new hypertensives to avoid constant repetition.

A number of drugs are available to treat high blood pressure. Figure 3 is an attempt to subdivide hypertensives into levels of blood pressure severity, and to indicate the initial appropriate therapeutic regimen. We have labeled “mildest hypertension” as being in the range of 100 mm Hg diastolic. For this, a thiazide diuretic is probably the best (5). The thiazide diuretic dehydrates the patient very slightly, but the blood volume and total body water come back to normal after about two weeks. The patient does not stay dehydrated, but his blood pressure stays down. Fifty mg/day or twice a day or even 25 mg/day in a few patients can suffice (hydrochlorothiazide). There are some side effects that can be troublesome; hypokalemia, particularly in a patient who is taking digitalis. A rise in the serum uric acid may occur. We ignore this unless it gets very high or unless a patient has a history of gout, in which case it is lowered with allopurinol. Impairment of glucose tolerance occurs in a certain number of patients. This may be ameliorated by correction of hypokalemia. Thiazides do not seem to cause diabetes de novo. Other diuretics have

| MILDEST HYPERTENSION: Diastolic 100 mm Hg |
| Diuretic—thiazide is best—HCT 50 mg/day or b.i.d. |

| MODERATELY HYPERTENSIVE: Diastolic 110 mm Hg |
| Reserpine 0.1 to 0.2 mg/day |
| Thiazide daily or b.i.d. |
| Add hydralazine 25 to 50 mg t.i.d., if needed |

| MODERATELY SEVERE: Diastolic 120 mm Hg |
| Methyl dopa 250 mg b.i.d. and up |
| Thiazide daily or b.i.d. |
| Hydralazine 25 to 50 mg t.i.d., if needed |

| SEVERELY HYPERTENSIVE: Diastolic 130 mm Hg |
| Thiazide daily |
| Guanethidine 25 mg (or much more) q.a.m. |
| (titrate individual dose by B.P. response) |
| (Later perhaps add hydralazine) |

Fig 3—Drugs useful in treatment of several “grades” of hypertension.
hypotensive effects, but they are not as strong as the thiazide molecule. It does not matter which thiazide is used. There are about 15 of them on the market; it is a matter of dosage size, convenience, duration, and other factors. We use hydrochlorothiazide at MCV.

For moderately hypertensive patients (diastolic in the range of 110), something else is usually used in addition to the thiazide. The “something else” until recently was reserpine. We have taken all of our women hypertensives off reserpine. The reason is that several large surveys done in New York, and repeated in London, have shown association between breast cancer and reserpine therapy. This is a bombshell; nobody expected it. Several people at MCV have been over the data and say that the studies are well done. We are taking it seriously, but the final resolution of this problem awaits more data. The public health hospitals and VA hospitals have not seen fit to interfere with use of reserpine for their hypertensive patients, but have contented themselves with sending out a letter to all their physicians warning them about this data. We use small doses of methyldopa instead of the reserpine.

If something further is needed in addition to the small dose of reserpine or a small dose of methyldopa, hydralazine is added. Hydralazine is a very useful drug marketed under the name of Apresoline®. It is an old drug and has been around for a long time. It fell into disuse because of worry about a lupus erythematosus-like syndrome, which was quite serious in some patients. Studies have shown, however, that this will not occur if less than 200 mg/day is given to an average-size patient. Our schedule works out to a maximum dose of 150 mg/day. We use a lot of hydralazine and we have seen very little difficulty with it.

Moderately severe hypertensives, with diastolic hypertension around 120, require methyldopa instead of the reserpine. The dosage has to be titrated until the desired response is achieved. About 3.5 gm/day for the average-size patient is the largest effective dosage in our experience. There have been some recommendations in the literature for a four-times-a-day dosage, which is difficult for the patient to comply with. We have come to the conclusion that a twice-a-day dosage is acceptable, which is important in terms of compliance.

Severely hypertensive patients require our heavy artillery, guanethidine, marketed as Ismelin® (6). This is an annoying and troublesome drug to deal with. It interferes with sympathetic transmission in the periphery and, therefore, interferes with postural reflexes. We have a lot of patients walking the tightrope between symptomatic postural hypotension and control of their blood pressure with guanethidine. The drug takes several days to achieve its full effect, once given, and it takes several days to ease off once the dosage is decreased. It interferes with sexual function in males; this can be a limiting factor. Some men simply will not take the drug once they have had this experience. A physician can sometimes get by with less guanethidine and addition of a somewhat similar drug that does not have the same side effects, such as methyldopa. The MCV schedule says 25 mg “or much more.” The dose of guanethidine is the level achieved in the individual patient after titration. The dosage can be as much as 250 to 300 mg/day in a few patients. Hydralazine can be added to this program also and will sometimes help in the control without adding additional symptoms. Gastrointestinal distress is a problem with guanethidine. It does not seem to produce any irreversible reaction in the G.I. tract, but it can certainly produce a symptomatic diarrhea that is very annoying. Lomotil® (diphenoxylate) is useful for this. Guanethidine can also cause exercise hypotension, a problem with laborers. We try to get by, if we can, without using large doses of guanethidine. There are, however, some patients who require it.

Another drug just recently on the market is clonidine or Catapres®. This drug has a mechanism of action similar to methyldopa, probably a central (brain) action that “turns down” the sympathetic system so that it is less active. Clonidine is used similarly to methyldopa. We have not used much of it at MCV because of a pronounced “overshoot” of blood pressure when it is stopped.

A word about drug combinations. It is obvious that more than one drug is often used. Drug combinations are useful and important because they are cheaper and because they simplify compliance to therapy. They may present some difficulties, however. A well-known triple combination contains reserpine 0.1 mg, hydralazine 25 mg, and hydrochlorothiazide 15 mg. If this is given twice a day, an appropriate dose of reserpine is being given but not enough hydralazine or enough hydrochlorothiazide. If the frequency is increased to three times a day, the dosage contains a reasonable amount of hydralazine, but still not quite enough thiazide and already too much reserpine. If the frequency is increased yet to six times a day, entirely too much reserpine is being given. Most
patients will feel badly if they are taking that much reserpine. The hydralazine and hydrochlorothiazide are acceptable. The best way to handle combinations is to start the patient on individual components, see what he needs, and then look up the combinations to see if you can switch him to something that is cheaper and involves one less pill, in which case it is worth doing.

There are a few patients who are not going to respond to standard therapy. A vasodilator of sufficient power would decrease the blood pressure by increasing the size of peripheral arteries, and allowing the blood to circulate faster (7). When this is done, an increase in cardiac output occurs with an annoying heavy palpitation and heavy heart beat. In some instances, angina pectoris occurs where it did not exist before. (This can be a side effect to hydralazine, for instance, in a patient with coronary disease). Such a vasodilator may also cause systemic edema, in some instances even heart failure, and weight gain. These undesirable effects can be blocked. Propranolol (Inderal*) will block the tachycardia. A diuretic (thiazide or furosemide) will prevent the weight gain and edema. This is called “triple therapy.” Vasodilators that are more powerful than hydralazine will come on the market within a year or so, allowing better use of this triple therapy. The name of one is minoxidil. Propranolol must be used cautiously as it does interfere with stroke volume, and it presents a significant danger to people with heart disease, particularly heart disease that has been of sufficient magnitude to have ever caused heart failure. This is regarded as a contraindication under most circumstances. Asthma is also a contraindication. We give propranolol in such a manner as to not drive the heart rate down too low. We like to have the heart rate remain at 60 or above, seated.

In summary, in office management of hypertension, patient education is very important; patient motivation and a strong doctor-patient relationship are needed. The interest and enthusiasm of the physician in treating blood pressure will often be the determining factor in whether or not the patient complies. Very simple therapy suffices for most patients. Control is possible even in most severe cases, but with these, considerable individualization will be needed and frequent office visits.

Figures 1 and 2 are reproduced with permission from the Virginia Medical Monthly (101:942-947, 1974).

REFERENCES