Home and office blood pressures. Clinical observations and hemodynamic mechanisms

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Wide fluctuations in arterial pressure have long been recognized as a feature in many hypertensive patients and have consistently been a major difficulty in decisions for treatment and understanding of pathophysiology. It is only in the past decade that more precise estimates of the degree of diurnal variations could be obtained by ambulatory 24-hour recordings of blood pressure from intra-arterial catheterization (1) or non-invasive methods (2–3). In the absence of these methods, it is still possible to avoid the pitfalls associated with sole dependence on office blood pressure levels by asking the patients to measure their own pressures at home or at work. This was the method used for over forty years in our center; it had many advantages that could outweigh its limited number of daily observations. Blood pressure could be followed over long periods of time and not be limited to one day; the patients developed a greater sense of participating in their follow-up and came to recognize their pressure fluctuations as a physiological variable analogous to changes in daily weight.

Patients are taught to measure their own blood pressure by an experienced nurse. They measure their own blood pressure twice daily at home both in the sitting and standing positions. A regular log of these measurements is mailed to our center every 2–4 weeks. The accuracy of these readings is checked using a double stethoscope whenever the patients come for an outpatient visit or occasionally by a student visiting them at home. The weekly average of these blood pressure values is then calculated and plotted (Fig. 1). In the evaluation of the patient's course, his/her office arterial pressure readings are compared with the average of home blood pressure records during the week corresponding to the office visit.

Our study of the discrepancies between home and office blood pressure records included three aspects: a) the clinical evaluation of some factors that account for these differences, b) an investigation of possible hemodynamic mechanisms, and c) a correlation of cardiac complications (left ventricular hypertrophy) with both sets of records to define which one was more closely linked with target organ damage.
Fig. 1. The weekly average of twice daily home blood pressure values (taken by the patient) are calculated and plotted. Ordinate represents home systolic (upper line) and diastolic (lower line) blood pressure (mmHg).

Clinical evaluation

The first part of this report was based on our experience with fifty-five hypertensive patients whose records met the following conditions:

a) antihypertensive medications had been kept constant for a long enough period of time (at least one month);

b) presence of complete and uninterrupted records of twice daily home blood pressure measurements over that same period of time, and

c) the patient had at least three office visits during that period.

The group consisted of 23 women and 32 men with a mean age of 48 ± 1.4 (SEM) years. Sixteen patients were untreated; all others were taking either diuretics or beta-blockers, or a combination of beta-blockers and diuretics. A part of these data has been previously reported (4).

Figure 2 illustrates the discrepancy between home and office blood pressures. Sixty-five percent. of patients had higher office blood pressure > 10 mmHg. Indeed, using 140/90 mmHg as an arbitrary measure of borderline hypertension, 33% of patients had "normal" home blood pressures (weekly average) while the corresponding office blood pressures were elevated.

It has been previously suggested that the higher office blood pressure could be attributed to such factors as anxiety, stress, fear and unfamiliarity with the medical surroundings (5). This hypothesis, however, was not supported by our experience. We found no "tell-tale" clinical sign that could point to apprehension or stress; the patient appeared calm, showed no visible perspiration and was asked to relax his muscles consciously when his blood pressure was being measured. Moreover, using heart rate as an indicator of "tension", we found no correlation between office-home blood pressure discrepancy and office heart rate. Finally, a marked difference between office and home blood pressures persisted in 34 patients over a follow-up period of 12 months, irrespective of the treatment used and of the number of follow-up visits (4).