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Slany J

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Do We Have to Rewrite the Normal Limits of Home Blood Pressure?

J. Slany

Due to poor reproducibility of office blood pressure readings, decisions on treatment should rather rely on repeated self-measurements by the patient or ambulatory blood pressure monitoring (ABPM). The different methods produce different values which are correlated to each other. Thus, values obtained by one method in cohorts may be converted into that of another method but no meaningful conversion is possible in individual subjects. Based on numerous comparative studies, international guidelines have proposed an average blood pressure of 135/85 mmHg as the limit of normal home blood pressure corresponding to an office value of 140/90 mmHg. However, a recent study concluded that the threshold of normal home blood pressure should rather be set at 130/85 mmHg [1].

Indeed, based on data obtained in different cohorts variable thresholds were proposed in the past with a recent trend to higher values. On account of the uncertainty of data no further differentiation of blood pressure stages were given [2] or only vaguely suggested [3]. Staging is important for the conduction and interpretation of trials and for recommendation of management options, be it lifestyle measures, drug regimens, or interventions, eg, renal sympathetic denervation. So far, staging rests on international consensus though arbitrarily defined and is based on office measurements in large cohorts.

The cited study of Niiranen et al [1] is the first to rely on prospective outcome-driven data from large cohorts residing in different countries. Mean follow-up of 6450 normotensive or hypertensive subjects (22 % treated) was 8.5 years. Blood pressure was obtained by self- and office measurements. Based on comparative data the authors suggest somewhat lower thresholds as defined in the past (Table 1). Actually, the proposed values are rounded down compared to the observed ones. Of note, like in a publication by the OHASAMA group [4] published nearly simultaneously self-measured values corresponding to 140/90 mmHg obtained conventionally differed between untreated and treated individuals. Niieranen et al observed 133/82 for the whole group and 132/82 in the untreated group; in OHASAMA the values were 134/88 in treated and 128/85 mmHg in untreated individuals. However, confusing the situation further, values in OHASAMA differed depending on daytime. In the morning, systolic values were 2–4 mmHg higher than in the evening. What should be the consequences for treatment targets? An answer may be provided by another recently published study from Japan [5]: 3518 middle-aged hypertensive persons randomized to strict or usual blood pressure control based on self-measurement were observed for a median follow-up of 5.8 years. Lowest rates of cardiovascular events were observed with a systolic home blood pressure of 131.6 mmHg (diastolic values not reported). This corresponds roughly to a value of 135 mmHg with office measurement and thus lies in the range of the treatment goal recommended by the revised ESH guidelines. In Table 1, thresholds for home and daytime ABPM proposed by several authors are listed. In most studies, daytime ABPM and self-measured values differ only marginally. Recently, relying on the recommendations of the ESH and other published material we have suggested thresholds for different stages of normal and elevated blood pressures [6, 7] slightly higher than those proposed now [1].

Given the variability of current data, thresholds of blood pressure self-measurement have not to be rewritten. As long as convincing new data are missing 135/85 mmHg seems an ap-

Table 1. Suggestions for ambulatory blood pressure classification (mmHg).

Blood pressure classification	Normal	High normal	Hypertension I	Hypertension II
Office measurement	120–129/80–84	130–139/85–89	140–159/90–99	≥ 160/≥ 100
Ambulatory blood pressure measurement				
Day, ÖGH 2007	120–129/80–84	130–134/< 85	≥ 135/≥ 85	–
Day, Zweiker 2012	125–129/75–79	130–134/80–84	135–149/85–94	≥ 150/≥ 95
Self-measurement				
ESH 2008	120–129/80–84	130–134/< 85	≥ 135/≥ 85	–
Slany, Zweiker	120–124/80–84	125–134/80–85	135–149/85–94	≥ 150/≥ 95
Niiranen, proposed	120–124/75–79	125–129/80–84	130–144/85–89	≥ 145/≥ 90
Asayama, optimum treatment value	–	~132/not given	–	–

propriate limit for normal self-measured blood pressure; systolic values of 130 ± 5 mmHg are suggested as treatment target in the majority of hypertensive subjects. Of note, it is worth recalling a statement of the ESH guidelines 2007 [8]: The values should be regarded as approximate thresholds and, accordingly, as an orientation guide.

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Korrespondenzadresse / Correspondence to:
Univ.-Prof. Dr. med. Jörg Slany
A-1090 Wien
Mariannengasse 21
E-Mail: joerg@slany.org

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