Automated blood pressure measurements: optimal diastolic blood pressure range in treated hypertensives at high cardiovascular risk

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Topic(s):
Blood Pressure Measurement

Citation:
European Heart Journal (2019) 40 (Supplement), 399

Background/Introduction: Automated office blood pressure measurements (AOBPM) is recommended for the diagnosis of arterial hypertension. Nevertheless, use of automated office blood pressure in monitoring of treated patients with hypertension is limited by the discrepancies between AOBPM, auscultatory and research grade measurements of blood pressure. The treatment targets using AOBPM are not well-determined.

Purpose: This post-hoc analysis is aimed to establish the optimal range for on-treatment diastolic blood pressure (DBP) measured with AOBPM in hypertensive patients without cardiovascular disease but at high risk, who achieved systolic blood pressure treatment goal (SBP).

Methods: Data of 3715 subjects without prior cardiovascular disease treated to achieve SBP goal <120 mm Hg were selected from SPRINT trial database obtained from National Heart, Lung and Blood Institute. Clinical endpoint was defined as myocardial infarction, acute coronary syndrome not resulting in myocardial infarction, stroke, acute decompensated heart failure or death from cardiovascular causes.

On-treatment blood pressure was computed as mean of AOBPM readings in a period from 6th month until to end of the study, which was considered as with a stable blood pressure.

Optimal on-treatment DBP range was established on the basis of hazard ratio plot for clinical endpoint after adjustment for age, sex, SBP, smoking habits and history of chronic kidney disease. The target DBP range was set to be 10 mm Hg wide, what is line with current ESC/ESH guidelines. To evaluate nonlinear relationship between continuous variables and outcome cubic spline methods were used.

Results: Data of 3715 (38.3% female and 61.7% male) subjects aged 67.3±9.2 mm Hg were analysed. Mean on-treatment SBP and DBP were 120.8±8.5 mm Hg and 68.2±8.1 mm Hg, respectively. Lowest hazard risk of primary endpoint was found in on-treatment DBP range 62.8–72.8 mm Hg with a minimum at 67.8 mm Hg (Figure 1). Hazard risk increased linearly toward lower and higher values than selected optimal DBP range.

Conclusion(s): In treated hypertensives at high cardiovascular risk, but without prior cardiovascular disease who achieved SBP treatment goal, on treatment DBP 62.8–72.8 mm Hg range should be considered when treatment is monitored using AOBPM.
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Figure 1

Hazard ratio for the clinical endpoint

10 mm Hg range

lower limit of optimal DBP range

minimum of hazard ratio

upper limit of optimal DBP range

On-treatment DBP [mm Hg]

Hazard Ratio

Figure 1