

Marked BP distribution shift from casual to ambulatory measurement in Kenya: screening implications for sub-Saharan Africa

Background

Few studies have used ambulatory blood pressure monitoring (ABPM) to describe blood pressure (BP) patterns in sub-Saharan Africa (sSA). We conducted a population-based study in Kilifi, Kenya to determine the usefulness of ABPM in this setting.

Methods

An age-stratified sample of 1248 individuals were randomly selected from our Demographic Surveillance Area. Of these, 986 underwent casual BP measurement at their homes using an automated Omron™ M10-IT monitor. All individuals with casual BP $\geq 140/90$ mmHg (mean of 2 out of 3 readings) and a random subset with BP $< 140/90$ mmHg were invited to undergo 24-hour ABPM within one week of screening. ESH defined cutoffs were used to define hypertensive status.

Results

Of 415 individuals who underwent both casual and ABPM measurement, 162 (39%) had sustained hypertension, 161 (39%) were normotensive, 58 (14%) had whitecoat hypertension and 34 (8%) had masked hypertension.

Population BP was markedly higher when using casual BP compared to ABPM (11 mmHg 95% CI [9-13] systolic and 9 mmHg [7-11] diastolic). If casual BP measurement only had been used, age standardized population prevalence of hypertension would have been 26.5% (19.3-35.6). 'True' prevalence by ABPM was 17.1% (11.0-24.4), masked hypertension 7.6 (2.8-13.7)% and white coat hypertension 3.8% (1.7-6.1) of the population. The sensitivity and specificity of casual BP measurement for 'diagnosing' hypertension were 80% (73-86) and 84% (79-88) respectively. The positive and negative predictive values were 80% (74-85) and 84% (79-89). BP indices and validity measures showed strong age related trends; for example sensitivity of casual BP was 9.7% (2.5-24.9) in 30-39 year olds but 91% (83-97) in 60-69 year olds. Non-dipping was present in 9% (3-15) of the population and was strongly associated with masked hypertension (OR 10, [4-27]).

Conclusions

Casual BP measurement methods substantially overestimated hypertension prevalence, while failing to identify a significant proportion who were hypertensive on ABPM. Whether ABPM identifies those at risk of future vascular events better than casual methods and is justified on cost effectiveness in sSA are key research questions.