Blood Pressure Monitoring

2.3 New-Onset Diabetes Mellitus and Impaired Fasting Glucose in White Coat, Masked And Sustained Hypertension: the PAMELA Study

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Introduction. In the general population, the increase of blood pressure (BP) is accompanied by an increase of metabolic variables, including blood glucose.

Aim. To investigate the long-term risk of white coat (WCH), masked (MH) and sustained hypertension (SH) of developing impaired fasting glucose (IFG) and diabetes mellitus (DM).

Methods. In a sample of 1400 subjects of the PAMELA Study, randomly selected from the general population of Monza (Milan, Italy), stratified for gender and decades of age (25 to 74 years), we measured: (1) office BP (mercury sphygmomanometric technique); (2) 24 hour BP mean by ambulatory blood pressure (Spacelabs 90207, automatic oscillometric measurements every 20 min during the 24-hours); (iii) plasma glucose (radioenzymatic method). The condition of WCH was identified when BP was > 140 mmHg systolic or 90 mmHg diastolic and 24 hour BP mean was < 125 mmHg systolic or 79 mmHg diastolic. MH was identified when BP was < 140 mmHg systolic or 90 mmHg diastolic and 24 hour BP mean was > 125 mmHg systolic or 79 mmHg diastolic. SH was identified when both 24 hour BP means were over the threshold values. The subjects were re-analyzed 10 years later, to identify the new cases of IFG and DM, defined when fasting blood glucose was > 110 mg/dL and > 126 mg/dL (or use of antidiabetic drugs) respectively, being < 110 mg/dL and < 126 mg/dL respectively at the first examination.

Results. WCH, MH and SH were identified respectively in 225 (16.1%), 124 (8.9%) and 293 (20.9%) subjects of the original sample. At the second examination we found 101 and 53 new cases of respectively IFG and DM. As compared to subjects with both 24-hour mean BP normal (normotensive subjects), WCH, MH and SH have higher age and gender-adjusted risk of developing a new IFG (HR 3.715, 2.852 and 2.96 respectively, $p < 0.005$). Statistical significance remains also after a further adjustment for antihypertensive treatment and baseline glycaemia. The age and gender adjusted risk of developing a new DM was also significantly higher in WCH, MH and SH as compared to normotensive subjects (HR 2.876, 2.71, 2.228 respectively, $p < 0.05$). Statistical significance disappeared after further adjustment for antihypertensive treatment and baseline glycaemia. Independent contributors in the development of DM were: antihypertensive treatment, baseline blood glucose, cholesterol, triglycerides and body mass index.

Conclusions. The abnormality of either 24-hour mean BP is associated with an enhanced risk of developing IFG and DM. This may contribute to the increased cardiovascular hazard characterizing not only SH but also WCH and MH.