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Título	24-hour Blood Pressure Homeostasis in Subjects with Different Degrees of Glucose Tolerance
Autor	TÁSSIA CIVIDANES PAZINATO
Orientador	FERNANDO GERCHMAN
Instituição	Hospital de Clínicas de Porto Alegre

Background: Hypertension is a major risk factor for cardiovascular disease and microvascular complications. Disturbances in glucose metabolism are probably related to abnormalities of blood pressure (BP) homeostasis. Although it is well known that BP increases with deterioration of glucose tolerance (GT), it is poorly understood which factors are involved with it and how BP behaves along the day in subjects with different degrees of GT. Twenty-four hour ambulatory blood pressure monitoring (24-h ABPM) might be used to better understand the development of hypertension associated with abnormalities of glucose metabolism. **Objective:** To analyze the circadian rhythm of BP and its possible determinants in subjects with different degrees of GT. **Material and methods:** In a cross-sectional design, 118 subjects (53.4 ± 12.5 years, females 70.3%, hypertension 70.0%, education years 8 [5 – 12; P25 - P75]) were submitted to 75-g oral glucose tolerance test after overnight fast and classified as normal GT (NGT; n=33), prediabetes (PDM; n=51) and diabetes (DM; n=34). BP was measured 3 times during evaluation and 24-h ABPM was performed. Blood and urinary samples were collected and plasma glucose (Glu), islets hormones (insulin [Ins], plasma glucagon, C-peptide, pancreatic polypeptide [PP]), cortisol, ACTH, adiponectin, creatinine, fibrinogen, US-CRP, 24-h urinary sodium, metanephrines and albumin excretion (UAE) were measured. Body size (BMI), central obesity (waist to hip ratio; WHR), insulin sensitivity (Stumvoll index; ISI), β-cell function (insulinogenic index; $\Delta Ins_{30'-0'}/\Delta Gli_{30'-0'}$) and glomerular filtration rate (eGFR; CKD-EPI) were estimated. **Results:** By ABPM, 24-h systolic BP (SBP) progressively increased from NGT to DM (NGT 121.0 ± 15.5 vs PDM 128.5 ± 14.3 vs DM 136.8 ± 18.2 mmHg; P<0.001). The same pattern was found with daytime (P=0.001) and nighttime ABPM (P=0.001). Diastolic BP did not increase with decreased GT (data not shown). 24-hour SBP was positively related to age (P<0.001), BMI (P=0.050), WHR (P=0.041), 2-h glucose (P<0.001), C-peptide (P=0.005), plasma cortisol (P=0.004) and UAE (P<0.001), whereas it was inversely related to education (P<0.001), ISI (P=0.005), $\Delta Ins_{30'-0'}/\Delta Gli_{30'-0'}$ (P=0.05), PP (P=0.009) and eGFR (P=0.016). It was not related to fasting glucose, glucagon, adiponectin, ACTH, US-CRP, fibrinogen, creatinine, sodium and metanephrines 24-h urinary excretion. After adjustment for confounding variables (sex, age, education, WHR, UAE), 24-h BP levels differ between NGT and PDM (P=0.031), NGT and DM (P<0.001), but not between PDM and DM (P=0.091). **Conclusion:** According to 24-h ABPM, BP levels increase with decreasing GT. PDM BP levels behave similarly with those found in DM and are probably different from NGT individuals. Insulin sensitivity, education, age, central obesity, postprandial hyperglycemia, β-cell dysfunction, renal function and counterregulatory hormones are possible determinants of 24-h BP levels and its behavior in subjects with different degrees of GT. These findings open new perspectives on the study in prevention and treatment of hypertension and its complications in early stages of abnormal glucose metabolism and new onset DM.

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