

DISRUPTION OF BLOOD PRESSURE CIRCADIAN RHYTHM MAY BE A PRECOCIOUS FINDING IN ABNORMAL BLOOD PRESSURE HOMEOSTASIS RELATED WITH ABNORMAL GLUCOSE METABOLISM

Bárbara Limberger Nedel, Vanessa Piccoli, Amanda Rodrigues Fabbrin, Manoella Freitas Santos, Alessandra Locatelli Smith, Rafaela Brugalli Zandavalli, Luis Henrique Santos Canani, Fernando Gerchman, Rosa Maria Levandovski, Maria Paz Loayza Hidalgo

Background and aims: Blood pressure (BP) behavior along the day may be implicated in the development of vascular complications of prediabetes (PDM) and diabetes (DM). Determination of abnormal patterns of BP circadian rhythm using 24-h ambulatory BP monitoring (ABPM) might help to clarify this relationship. Materials and methods: In a cross sectional study, we analyzed circadian variations of BP of 72 subjects (age 53.2 ± 12.5 years, females 76.0%) with normal glucose tolerance (NGT; $n=18$), prediabetes (PDM; $n=33$) and diabetes (DM; $n=21$). Data was fitted to a sinusoidal curve of 24 hours BP measured by ABPM, obtaining its acrophase which was compared among groups using the Rayleigh test which also quantifies the existence of a tendency in the group. The grouping of the acrophases for each group and each variable was calculated by means of the Rayleigh Z test for circular statistics. Results: Systolic BP (SBP) in subjects with NGT and PDM presented a phase advance in the rhythm of acrophase compared to those with DM. NGT and PDM SBP acrophase was at midnight whereas DM acrophase was during midday. In addition to that, the acrophase statistically differed between NGT and PDM ($n=24hr$; $r > 0.98$) and between NGT and DM ($n=24hr$ days; $r > 0.98$) subjects. No differences were seen in the acrophase between PDM and DM ($n=24hr$; $r > 0.98$) subjects. In contrast, a phase advanced in the rhythm of diastolic blood pressure (DBP) acrophase was found in subjects with DM compared to those with NGT and PDM. Conclusion: Disruption of circadian rhythm of blood pressure might be involved in the development of abnormalities of BP homeostasis and may be related to the development of vascular complications of early abnormalities of glucose metabolism, namely PDM.