in nocturnal BP (>35 mm Hg, 28% of the 24-hour mean) between extreme-dipper and riser hypertensive patients. Accordingly, the lack of nocturnal decline in BP cannot be justified by changes in physical activity alone.

**SUPPORT:** DGES, PM098-0106; PGICT00-PXI-32205PN; University of Vigo.

**Key Words:** Ambulatory Blood Pressure Monitoring, Physical Activity, Non-Dippers

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**P-126**

**VERY LOW FREQUENCY ULTRADIAN RHYTHMS IN BLOOD PRESSURE OF PRIMARY HYPERTENSIVE PATIENTS**

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Some of the molecules that regulate BP show very low frequency ultradian rhythms with periods of 6 to 12 hrs (i.e. endothelins, catecholamines). Evidence suggests that these rhythms may be altered during the development of hypertension. The aim of the present study was to investigate the presence of the same rhythms in systolic, diastolic and mean blood pressure as well as in heart rate, and its relationship with the intensity of the hypertension. 24-hrs AMBP was performed in 186 patients with diagnosis of primary hypertension undergoing or not pharmacological treatment. Extended time series were constructed from the original data by means of a method previously validated by us. The time series were then processed with the Fast Fourier Transformation Method. The intensity of hypertension was defined from AMBP as % of diurnal systolic recordings > 135 mmHg (S>135) and nocturnal recordings > 115 mmHg, % of diurnal diastolic recordings > 85 mmHg and nocturnal recordings > 75 mmHg (D>75). Data were statistically analyzed by MANOVA and Spearman’s Rho adjusted for age, BMI and pharmacological treatment. Two rhythms with periods of 7.6 hrs (p1) and 11.7 hrs (p2) respectively were identified in all the variables analyzed. The amplitude of these rhythms was not modified by pharmacological treatment. The following correlations between amplitude of rhythms and BP intensity were noted: (a) for systolic BP, S>135 and p1 (r= .148 p=.04), S>135 and p2 (r=.203 p=.01); (b) for mean BP, S>135 and p2 (r=.156 p=.03), D>75 and p2 (r=.145 p=.05). These findings suggest for the first time the existence of very low frequency ultradian rhythms in BP and heart rate as shown by AMBP, while the amplitude of the rhythms of systolic and mean BP are related to the hypertension intensity.

**Key Words:** Biological Rhythms, AMBP, Treatment

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**P-127**

**TIME-QUALIFIED TOLERANCE LIMITS FOR AMBULATORY BLOOD PRESSURE MONITORING IN THE DIAGNOSIS OF HYPERTENSION**

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To recognize the highly significant circadian variability of blood pressure (BP) is to admit that the diagnosis of hypertension should be based not just on whether a casual BP value is too high, but rather on more pertinent questions: How long is BP elevated above a given time-varying threshold? What is the excess BP? When most of the excess occurs? Answers to these questions may be obtained by establishing, first, an adequate reference BP threshold and, second, a proper measurement of BP elevation [Hermida et al. Hypertension. 2000;35:118-125]. Accord-

ingly, we derived time-specific reference standards for BP as a function of gender. We studied 375 normotensive volunteers (200 men), 43.1±1.0 (mean±SE) years of age, without medical history of hypertension and diurnal mean of ambulatory monitored BP below 135/85 mm Hg for systolic/diastolic BP. BM measured at 20-minute intervals during the day (07:00 to 23:00 hours) and at 30-minute intervals at night for 48 consecutive hours with an ambulatory Spacelabs 90207 device. Physical activity was simultaneously monitored by wrist actigraphy. Data from each BP series were synchronized according to the rest-activity cycle of each individual in order to avoid differences among subjects in actual times of daily activity. Data were then used to compute 90% circadian tolerance intervals for each gender separately, in keeping with the gender differences in BP previously documented [Hermida. Blood Press Monit. 1999;4:137-147]. The method, derived on the basis of bootstrap techniques, does not need to assume normality or symmetry in the data and, therefore, is highly appropriate to describe the circadian pattern of BP variability. Results not only reflect expected changes in the tolerance limits as a function of gender and circadian time of sampling, but also upper limits below the thresholds currently used for diagnosing hypertension, specially for women. The use of these circadian time-dependent tolerance limits for the computation of a hyperbaric index as a measure of BP excess has already been shown to provide a reproducible and high-sensitivity test for the diagnosis of hypertension [Hermida et al. Hypertension. 2000;35:118-125], that can also be used for evaluating a given patient’s response to treatment.

**SUPPORT:** DGES, PM098-0106; PGICT00-PXI-32205PN; University of Vigo.

**Key Words:** Ambulatory Blood Pressure Monitoring, Reference Limits, Circadian

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**P-128**

**PROSPECTIVE EVALUATION OF A HIGH SENSITIVITY TEST FOR THE EARLY IDENTIFICATION OF GESTATIONAL HYPERTENSION AND PREECLAMPSIA**

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Recent studies have tried to overcome poor results from isolated blood pressure (BP) measurements in detecting preeclampsia by relying on ambulatory BP monitoring (ABPM). Poor results from the test based on the 24-hour BP mean [Hermida & Ayala. Hypertension. 1997;30:1531-1537] have lead many authors to extrapolate that ABPM is not a valid approach in pregnancy. Against this background, we have evaluated prospectively whether the tolerance-hyperbaric test (THT), combined approach of establishing tolerance intervals for the circadian variability of BP as a function of gestational age, and then computing the hyperbaric index (HBI, area of BP excess above the upper limit of the interval) by comparison of any patient’s BP profile with those intervals, provides high sensitivity for the identification of pregnant women who subsequently will develop gestational hypertension or preeclampsia. We analyzed 2430 BP series obtained from 235 women with uncomplicated pregnancies and 168 who developed gestational hypertension or preeclampsia. BP was measured at 20-minute intervals during the day (07:00 to 23:00 hours) and at 30-minute intervals at night for 48 consecutive hours once every 4 weeks from the first obstetric visit (mostly before 14 weeks of gestation) until delivery. Circadian 90% tolerance limits for BP were computed as a function of trimester of pregnancy from 497 BP series previously sampled from an independent reference group of 189 normoten- sive pregnant women. The HBI was then determined for each BP series in the validation sample. Sensitivity of the THT was 92.7% for women sampled during the first trimester of gestation, and increased up to 99.2% in the third trimester. Specificity was above 99% in all trimes-