ORAL SESSION

ORAL SESSION 1A

BLOOD PRESSURE MEASUREMENT

1A.01 A NOCTURNAL RISE IN AMBULATORY BLOOD PRESSURE IS ASSOCIATED WITH INCREASED AORTIC STIFFNESS IN PATIENTS WITH CHRONIC KIDNEY DISEASE STAGE 3 AND 4

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Objective: Chronic kidney disease (CKD) and loss of nocturnal “dip” in blood pressure (BP) are independently associated with increased cardiovascular risk. Previous studies of hypertensive subjects have shown significant associations between increased aortic pulse wave velocity (APWV) and a reduced nocturnal dip. There has been limited investigation into this relationship in patients with chronic kidney disease. We therefore sought to investigate the relationship between diurnal variation in ambulatory blood pressure monitoring (ABPM) and arterial stiffness in patients with CKD.

Design and Method: 153 participants with CKD stage 3 and 4 were recruited prospectively into a cohort study of cardiovascular risk in CKD. Baseline measurements of APWV and 24-h ABPM were obtained. Subjects were divided into categories of “dipper” (>10% nocturnal reduction in mean systolic BP), “non-dipper” (0–10% nocturnal reduction in mean systolic BP), and “reverse-dipper” (>0% nocturnal increase in mean systolic BP).

Results: APWV was significantly higher in the reverse-dipper group than in either the nondipper or dipper groups (14.64 ms⁻¹ vs. 12.77 ms⁻¹ and 12.50 ms⁻¹ p = 0.005). Following stepwise multivariate regression including age, gender, clinic BP, heart rate, eGFR, height, weight, diabetes, cholesterol, and pack year smoking history, APWV remained independently associated with percentage nocturnal dip (R = 0.768, p = 0.023).

Conclusion: Aortic stiffness is significantly increased in patients with both CKD and a nocturnal rise in 24 h ABPM, independent of other known cardiovascular risk factors. Loss of the normal diurnal pattern of blood pressure may contribute to the excess vascular risk seen in these patients.

1A.02 GEOGRAPHICAL FEATURES AND DETERMINANTS OF MASKED HYPERTENSION IN 9,753 HYPERTENSIVE SUBJECTS FROM FIVE CONTINENTS: THE ARTEMIS INTERNATIONAL REGISTRY


Background: The ARTEMIS Project is an international ambulatory blood pressure monitoring (ABPM) registry of subjects from Hypertension (HT) Clinics in different countries, aiming to assess the prevalence of daily life HT phenotypes. In the present analysis, we investigated the features and determinants of masked hypertension (MH).

Methods: Sitting clinic blood pressure (CBP) was measured in all subjects before being submitted to 24 h ABPM. The prevalence of MH was defined as a CBP < 140/90 mmHg and a 24-h ABP ≥ 130/80 mmHg. A logistic regression analysis was used to assess the determinants of MH. Categorical variables previously verified in univariate tests were entered in the multivariate model as covariates (gender, diabetes, dyslipidemia, antihypertensive treatment, alcohol, smoking, obesity, age, dipper status).

Results: 9,753 subjects were analyzed (mean age was 56 ± 14 years, 51% males, 47% treated for HT). Results were confirmed by safety analysis on comparable numbers of patients from each continent. The proportion of subjects with MH was higher in Africa and Asia than in other continents (p < 0.0001). MH was also slightly more common in untreated (12%) than in treated subjects (10%, p < 0.0001). In the multivariate analysis, the OR for MH was 2.2 (95%CI: 1.7, 3.0) for Africa (p = 0.001 vs. other countries) and 4.3(3.5, 4.8) for Asia (p = 0.001 vs. other countries). Males [OR 1.3 (1.2, 1.5) p = 0.001], diabetics [1.4 (1.2, 1.6) p = 0.001], and smokers [1.3 (1.1, 1.5) p = 0.004] had a significantly higher prevalence of MH. Old individuals (≥65 years) and dippers were less likely to display MH [OR: 0.7 (0.6, 0.8) p = 0.0001, for both]. In single continents, MH was always more common in males, diabetics (except South-America), smokers, younger subjects, and nondippers (except South-America).

Conclusion: MH is quite common among HT subjects worldwide and is more likely to occur in people living in Africa and Asia than in other continents, with a higher prevalence in young male smokers with diabetes. A lack of blood pressure dip at night seems to be an important determinant of MH (see Table on page e2).

1A.03 IMPACT OF DIFFERENT INDICES OF SHORT-TERM BLOOD PRESSURE VARIABILITY ON LARGE-ARTERY STIFFNESS

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Background: Aortic stiffness, a prognostically adverse marker of arteriosclerosis, is critically dependent on blood pressure (BP). Increasing evidence suggests a link between short-term BP variability and cardiovascular complications in hypertension, but the effects of BP variability on large-artery stiffness are understudied, and confounded by a lack of agreement on how to properly define short-term BP variability.

Methods: 580 consecutive untreated patients with uncomplicated essential hypertension (61% men, BP 148/93 mmHg) underwent determination of carotid-to-femoral pulse wave velocity (cPWV), a direct measure of aortic stiffness, by high-fidelity applanation tonometry (SphygmoCor), and 24-h ambulatory BP monitoring with a validated device (SpaceLabs 90207, one
Abstract 1A.02 – Table.

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List of all the Investigators of the ARTEMIS Registry (in alphabetical order):

Achimatos A. (Greece) Imai Y. (Japan) Nasothimiou E.G. (Greece) Siegelová J. (Czech Republic)
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reading every 15 min for 24 h. Short-term systolic BP (SBP) variability was calculated as (1) standard deviation (SD) of daytime and night-time SBP; (2) weighted SD of 24-h SBP, which removes the mathematical interference from nocturnal BP fall; and (3) average real variability (ARV), or the average of the absolute differences between consecutive SBP measurements over the 24 h.

Results: All measures of SBP variability showed a direct correlation with cfPWV (SD of daytime and night-time SBP, r = 0.200; 17; weighted SD of 24-h SBP, r = 0.25; ARV, r = 0.26; all p < 0.001). The above relations remained significant when the effects of age, sex, and office SBP were removed in a partial correlation analysis. cfPWV had significantly stronger relations with either weighted SD of 24-h SBP or ARV than with SD of daytime SBP (r-statistics, p = 0.046 and 0.049, respectively). In a multivariable linear regression model, ARV was an independent predictor of cfPWV together with age, sex, office, and average 24-h SBP, and cigarette smoking.

Conclusion: After taking into account the confounding effect of average BP, age, and several other risk factors, short-term systolic BP variability assessed with noninvasive monitoring is independently related to aortic stiffness in hypertension. The relation between BP variability and aortic stiffness may be sensitive to the method chosen for defining BP variability.

1A.04 ETHNIC DIFFERENCES IN THE DEGREE OF MORNING BLOOD PRESSURE SURGE AND IN ITS DETERMINANTS BETWEEN JAPANESE AND EUROPEAN HYPERTENSIVE SUBJECTS

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Background: Morning blood pressure surge (MBPS) has been reported to be a prognostic factor of cardiovascular events. However, it is not clear whether there might be differences in the degree of MBPS between Japanese and Western hypertensive patients.

Methods: We selected 2,904 hypertensive patients (mean age: 62.3 ± 8.8 years) from a European ABPM database and 811 hypertensive patients from a Japanese database (JMS-ABPM WAVE1: n = 811, mean age: 72.3 ± 9.8 years), following the same inclusion criteria. Their 24-h ambulatory BP recordings were analyzed focusing on MBPS.

Results: The sleep-trough MBPS defined as mean systolic blood pressure during the 2-h after awakening minus the mean systolic blood pressure during the 1-h that included the lowest sleep blood pressure was significantly higher in Japanese hypertensive patients than in European hypertensive patients after matching for age and 24-h mean BP levels (40.0 ± 18.2 mmHg vs. 22.6 ± 13.4 mmHg, p < 0.001). Age was independently associated with MBPS in the Japanese database (standardized β = 0.13, p = 0.014), but this association was not found in European subjects (β = −0.04, p = 0.333) adjusting covariates.

Conclusion: Our results for the first time show the occurrence of substantial racial differences in the degree of MBPS. These findings may help understanding the role of racial differences in cardiovascular risk assessment and in implementing effective measures for prevention of BP-related cardiovascular events.

1A.05 24 HOUR AMBULATORY CENTRAL BLOOD PRESSURE MEASUREMENT REVEALS SIGNIFICANT VARIATION IN PULSE PRESSURE AMPLIFICATION BETWEEN DAY AND NIGHT

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Objective: Brachial ambulatory blood pressure monitoring (ABPM) provides greater predictive value for cardiovascular events than clinic blood pressure (BP) readings. However, systolic BP varies throughout the arterial tree, such that brachial BP readings do not reliably indicate central (aortic) pressure. As yet, 24-h ambulatory central BP and central to peripheral pressure amplification have not been described.

Design and Methods: 24-h Ambulatory brachial and central BP monitoring was undertaken in 122 healthy, treatment-naive individuals (71 females), using the mobilograph device (IEM, Germany). The mean age was 48 ± 20 years (range 18–80 years). Ambulatory measurements were made every 30 min during the day and every 60 min overnight. Clinic (seated) BP was also assessed, prior to undertaking ambulatory measurements.

Results: Mean clinic (seated) BP was 130 ± 21/79 ± 11 mmHg. During the daytime, mean ambulatory BP was 125 ± 14/80 ± 12 mmHg (brachial) and