Abstract: P181

Association between adrenomedullin polymorphism and high blood pressure in a population of Lithuanian children and adolescents

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Hypertension, Pulmonary Hypertension

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Introduction: High blood pressure (HBP) affects almost a half of the adult population worldwide and is one of the major risk factors of cardiovascular disease. The prevalence of overweight and obesity is increasing in economically developed countries and this tendency is related not only in adults but also in children and adolescents. In addition to environmental factors, a series of genome-wide association studies have identified nearly 30 new loci linked with resting BP and hypertension risk. However still unclear how these genetic variation influences blood pressure. In this study, we selected adrenomedullin (ADM) that is a vasodilator peptide which plays a critical role in blood pressure homeostasis and has a wide range of biological functions. Its role in blood pressure regulation has been examined in numerous different studies by showing that ADM could be a promising biomarker for cardiovascular disease in the future.

Purpose: The aim of this study was to evaluate the association of ADM gene polymorphism and HBP among Lithuanian children and adolescents aged 12-15 years.

Methods: This was a cross-sectional study of a randomly selected sample of 675 12-15-year-old adolescents who participated in the survey "The Prevalence and Risk Factors of HBP in 12-15-Year-Old Lithuanian Children and Adolescents (from November 2010 to April 2012)". All participants underwent anthropometric measurements. According to "The Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents", normal BP was defined as SBP and DBP less than the 90th percentile, and HBP was defined as SBP and DBP $\geq$90th percentile for sex, age, and height. The participants with HBP were screened on two separate occasions. Single-nucleotide polymorphism (SNP) of ADM gene (rs7129220) was evaluated using real-time PCR. Adjusted odds ratios (aORs) with 95% confidence intervals (CI) for the associations were estimated using multivariate logistic regression models.

Results: The prevalence of high blood pressure (BP $\geq$90th percentile) was 36.9%. Boys were more likely to have HBP than girls (OR =2.03; 95% CI 1.48–2.79, P < 0.001). Overweight/obesity and high WC ($\geq$75th percentile) were associated with HBP (OR = 3.88; 95% CI 2.53–5.96, P < 0.001 and OR = 5.80; 95% CI 3.51–9.56, P < 0.001). In the multivariate analysis – after adjustment for sex, BMI and WC, carriers of ADM AG genotype (vs. carriers of ADM GG genotype), ADM AG+AA genotype (vs. carriers of ADM GG genotype) had higher odds of having HBP in codominant (aOR = 1.55; 95% CI 1.02–2.37, P = 0.041, and in dominant (aOR = 1.65; 95% CI 1.09–2.49, P = 0.017) inheritance models. Significant association was also observed in additive model (aOR = 1.67; 95% CI 1.14–2.43, P = 0.008). The lowest Akaike information criterion was for additive model.

Conclusion: Our data indicate that ADM gene polymorphism was significantly associated with higher odds of HBP in Lithuanian adolescents aged 12–15 years.
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