

UNCOVERING THE GENETIC PLEIOTROPY BETWEEN OBESITY AND HYPERTENSION IN ROMA POPULATION

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Background: Obesity and hypertension disproportionately affect Roma people. Although shared genetic determinants are assumed to influence both blood pressure (BP) and adiposity related phenotypes, their contribution to these two sets of phenotypes in Roma population remains poorly understood.

Objective: This study aims to estimate the shared genetic influence between adiposity and BP traits in a high-risk population like the Roma and to assess the effect of previously obesity associated genetic variants on BP phenotypes.

Subjects and methods: A total of 354 individuals from 50 extended Roma pedigrees residing in the Basque Country (Spain) were evaluated for seven anthropometric traits (weight, BMI, waist circumference, WHR and three components of the anthropometric somatotype) and four BP-related phenotypes (systolic and diastolic BPs, mean arterial pressure and pulse pressure). Genetic correlations between adiposity and BP traits were estimated using a variance components framework in the SOLAR program. Additionally, 24 variants previously associated with obesity were tested for association with BP phenotypes to identify potential drivers of pleiotropy in this population using R software.

Results: Among Roma adults, 52% were obese and 12% hypertensive; notably, 87% of hypertensive individuals were also obese. Waist circumference was genetically correlated with systolic BP (41%) and mean arterial pressure (42%), whereas no significant genetic correlations were observed for diastolic BP. Variants in the FTO gene were associated with increased diastolic BP, while rs1137101 (LEPR gene) showed a negative association with systolic BP.

Conclusion: The studied Roma population exhibits a high prevalence of obesity, frequently co-occurring with hypertension. However, evidence for pleiotropic effects between these conditions is limited and primarily centred in the genetic correlation between BP phenotypes and central adiposity. Shared environmental factors appear to play a greater role than pleiotropy in the covariation of these two conditions.

Keywords: Roma population; Obesity; Hypertension; Pleiotropy; Genetic variant.

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