TITLE: The role of arginine-vasopressin receptor gene polymorphisms in the development of anger-related traits

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ABSTRACT:
Introduction: Anger is an emotional reaction to threat, frustration or social provocation, which modulates an individual’s risk for aggression. Molecular-genetic studies demonstrated the involvement of arginine-vasopressin system in affective psychopathology. However, many of them lack the analysis of GxE-interactions thus providing controversial findings. The present study aimed to estimate the main effect of AVPRA (rs1042615, rs3803107) and AVPR1B (rs28632197, rs33911258) gene polymorphisms, as well as GxE effects on anger-related traits in healthy individuals.

Materials and Methods: The study involved 623 mentally healthy individuals from the Russian Federation (81.11% women; mean age 19.53±1.75 years). All participants were of Caucasian origin of several ethnic groups: Russians (N=225), Udmurts (N=218) and Tatars (N=180). Anger-related traits were assessed using Anger Scale of the Buss Perry Aggression Questionnaire (BPAQ-29). SNPs genotyping was performed used Real-Time PCR. Statistical analysis was conducted with PLINK v.1.9 followed by FDR correction for multiple testing.

Results: Statistical analysis revealed an association of AVPRA*rs3803107 T-allele (P_{FDR}=0.03; r²=0.01) and AVPR1B*rs33911258 G-allele (P_{FDR}=0.03; r²=0.01) and de-
creased anger. Multiple regression analysis demonstrated that smoking ($P_{FDR}=0.01$; $r^2=0.16$), birth season ($P_{FDR}=0.04$; $r^2=0.04$) and place of residence ($P_{FDR}=0.04$; $r^2=0.02$) significantly modulated association of $AVPR1B^{rs33911258}$ and anger, while birth season ($P_{FDR}=0.03$; $r^2=0.05$) significantly modulated association on the $AVPR1A^{rs3803107}$ and anger in total sample.

Conclusion: Our findings provide evidence for specific effect of several environmental factors (smoking, birth season and place of residence) on the associations $AVPR1A$ and $AVPR1B$ gene polymorphisms and anger-related traits.

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