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Genetic variants in *OXTR* gene and childhood physical abuse collaborate to modify the risk of aggression in Chinese adolescents

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Introduction & Objective: Accumulating evidence suggests that genetic and environmental factors may influence aggression susceptibility. Compared to some extensively studied candidate genes of aggression, very little is known about the *OXTR* gene. The objective of this study was to determine whether genetic variants in the *OXTR* gene were associated with aggression risk and whether the polymorphisms would show interactive effects with childhood maltreatment on aggressive behavior in Chinese adolescents.

Methods: A total of 996 participants including 488 cases and 488 controls were selected in our study. Aggression, childhood maltreatment was measured by self-reported questionnaire. Buccal cells of all subjects were collected. Genotyping was performed using SNPscan. We explored both main effects of *OXTR* polymorphisms, as well as interactive effects between the polymorphisms and childhood maltreatment on aggressive behavior.

Results: Participants who carried the rs237885 TT genotypes in *OXTR* gene had a higher risk of aggression compared to those who carried GG or GT genotypes under the recessive model (OR=1.40, 95% CI, 1.04-1.89) after controlling for potential confounders. In addition, we also found that the polymorphism had a synergic additive interaction with childhood physical abuse on the aggression risk. The synergy index (S), the Attributable Proportion due to interaction (AP) and the Relative Excess Risk due to Interaction (RERI) were 2.81 (95% CI, 1.37-5.77), 0.59 (95% CI, 0.33-0.84) and 6.69 (95% CI, 0.41-12.96), respectively.

Conclusion: The present study provides evidence that genetic variants of *OXTR* may contribute to the susceptibility of aggression. Moreover, this is the first study reporting significant interactive effects of *OXTR* polymorphism and childhood physical abuse on aggressive behavior in Chinese adolescents.

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