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Effects of *Polygala tenuifolia* - *Acori Graminei Rhizoma* on long-term behavior of attention deficit hyperactivity disorder model rats and its mechanism

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Objective: To investigate the effects of *Polygala tenuifolia* - *Acori Graminei Rhizoma* on behavior including spontaneous activity, impulsivity, learning-memorial ability of Spontaneously Hypertensive Rats (SHR) as a model of Attention-Deficit/Hyperactivity Disorder (ADHD) and explore its possible mechanism.

Methods: 4-week-old SHR rats were randomly divided into the model group, methylphenidate (MPH) group, *Polygala tenuifolia* - *Acori Graminei Rhizoma* group, the same age WKY young rats were selected as the normal control group, 10 rats in each group. Rats were gavage for 4 weeks in the dark-phase. Open Field Test (OFT) were conducted to evaluate the spontaneous activity of rats before the gavage, at the end of 4-week treatment, two weeks after the medicine withdrawal; Elevated Plus Maze (EPM), Novel Object Recognition Test (NORT) were conducted to evaluate the impulsivity and learning-memorial ability individually at the end of treatment. Prefrontal Cortex (PFC) were separated two weeks after the medicine withdrawal and contents of Dopamine (DA) and Dopamine Transportor (DAT) in PFC were detected by ELISA.

Results: Compared with the control group, *Polygala tenuifolia* - *Acori Graminei Rhizoma* group had shorter movement distance and less rearing activities in the OFT, reduced percentage of the times entering the open arms and staying duration in the total period in the EPM and the elevated preference index in the NORT after receiving four weeks treatment ($P < 0.05$). The *Polygala tenuifolia* - *Acori Graminei Rhizoma* group still had shorter movement distance and less rearing activities than model group two weeks after the medicine withdrawal ($P < 0.05$) and the contents of DA in PFC of the *Polygala tenuifolia* - *Acori Graminei Rhizoma*-treated rats were higher than that of control group ($P < 0.05$), but there was no significant difference in DAT levels between the two groups ($P > 0.05$).

Conclusion: *Polygala tenuifolia* - *Acori Graminei Rhizoma* could relieve the spontaneous activity and impulsivity, improve learning-memorial ability of ADHD model rats and still exert the therapeutic effects after the withdrawal, which may be related to elevated dopamine levels in the PFC.

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