Methods

From postnatal (P) day 27, Syrian hamsters (n=79) were weighed and received daily subcutaneous injections (0.1–0.2 mg/kg) of AAS (testosterone propionate, Sigma, St. Louis, MO). On the day following the last injection (P57), AAS-treated hamsters were randomly assigned to one of three treatment groups. Treatment groups consisted of: (1) AAS only, (2) Eticlopride, an antagonist of dopamine D2 receptors, (0.5 mM) (Sigma, St. Louis, MO) microinfused into the lateral anterior hypothalamus (LAH) shortly before an aggressive encounter (Schwartzer & Melloni, 2010a, 2010b). Treatment groups administered Eticlopride and Quinpirole (p<0.05 for both). Significant differences were also found for wall climbs between AAS and SO animals administered Eticlopride and Quinpirole (p<0.05 for both). These differences are not surprising considering the fact that drugs that interact with the D2 receptor often interfere with motor activity.

Results

For a summary of effects of the drug treatments in animals chronically treated throughout adolescence with SO or AAS, see Figure 1. Ancillary behavior analysis (i.e., wall climbs, total contact time, and grooming behavior) showed no significant differences between groups with the exception of a significant difference between AAS and SO animals pre-treated with Quinpirole and Eticlopride (p<0.001), where AAS animals spent significantly more time in contact with the intruder. AAS animals administered Eticlopride and Quinpirole also displayed more grooming behavior than AAS-animals administered saline (p<0.05 for both). Significant differences were also found for wall climbs between AAS and SO animals administered Eticlopride and Quinpirole and between SO animals administered saline and those microinfused with Eticlopride and Quinpirole (p<0.05 for both). These differences are not surprising considering the fact that drugs that interact with the D2 receptor often interfere with motor activity.

Discussion

The aggressive circuit is complex and has various neurochemical and anatomical components. Hypothalamic AVP has long been associated with the aggressive response, and is known to enhance aggressive responding in various animal models. Recently, it is also known that when the DA system works to inhibit aggression, and almost nothing is known about how the AVP and DA systems work together to influence the display of aggressive behavior within the LAH. The present data fall in line with previous reported data from our lab that show that a blockade of D2 receptor function in the LAH inhibits the aggressive response of adolescent AAS exposed hamsters. The data also support our hypothesis that the DA and AVP systems interact at the level of the LAH to influence aggressive behavior.

For details of this study, the guide to the laboratory of the elevated aggressive responses in AAS exposed animals is at least partially regulated by activation of DA receptors, and suggests that this mechanism lies upstream of AAS effects on aggressive behavior in the LAH region. This notion is further described with more detail with the Models section in the middle bottom portion of this paper.

References


