
Symposium TP-2
Thursday, July 27, 2006

**Serotonin Neural Signaling and Development
Modulate the Generation of the Aggressive
Phenotype in a Preclinical Model of Adolescent
Anabolic Steroid Abuse.**

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In the clinical literature, exposure to anabolic/androgenic steroids (AAS) is linked to increases in irritability, aggression, and violence. Yet, few preclinical studies have examined the impact of developmental exposure to these substances on biobehavioral processes regulating aggression. In recent studies we have shown that exposure to AAS during pubertal development facilitates the generation of animals possessing a highly aggressive phenotype. From a behavioral standpoint, this preclinical model is particularly useful for the study of AAS-induced aggression as drug treated animals display intense and appropriately targeted agonistic responses in the absence of established social interactions and cues, implicating the direct activation of neural mechanisms controlling aggression, e.g., the serotonin (5HT) neural system. Indeed, AAS-treated hamsters displayed highly escalated aggression that could be reversed by increasing extracellular 5HT and/or enhancing the activity of select 5HT receptors within brain, implicating a role for 5HT in adolescent AAS-induced aggression. Neurobiologic studies indicated that adolescent AAS-treated animals showed significant decreases in 5HT neural development and the expression of the aggression-suppressing 5HT₁ and 1B receptor subtypes in many areas of brain implicated in aggression regulation. Most significantly, 5HT development and 5HT_{1A} and 1B receptor expression were most affected in the anterior hypothalamus, a brain region critical for the consummation of aggression in hamsters. Together, these data suggest that adolescent AAS exposure increases aggression by reducing 5HT development/activity and 5HT receptor expression within the AH, providing direct evidence for a pivotal role of AH-5HT in adolescent AAS-induced aggression. A model for how alterations in AH-5HT neural functioning may facilitate the development of the aggressive phenotype in adolescent-AAS exposed animals will be presented.