

HYPOTHALAMIC-PITUITARY-ADRENAL AXIS AND CATECHOLAMINES FUNCTION CORRELATION WITH AGGRESSIVE TRAIT AND AGGRESSIVE BEHAVIOR IN HUMANS

Gerra Gilberto*, Zaimovic Amir, Giusti Francesca, Brambilla Francesca

Centro Studi Farmacotossicodipendenze, AUSL Parma, Parma 43100, Italy

Our recent studies were designed to investigate neuroendocrine changes related to coping with stress and defense mechanisms during affective status. Many human laboratory procedures have been used to elicit psychological stress, aggressive responses and emotional stimuli in healthy subjects.

Aggressive trait, defensive pattern in front of unpleasant stimuli and aggressive behavior have been tested in relationship to hypothalamic-pituitary-adrenal axis and sympathetic function.

Aggressive trait seems to be related to hypothalamic-pituitary-adrenal axis and catecholamines hyperactivity both in adult and adolescent subjects.

Similarly the proneness to aggressive responses during an experimental paradigm is associated to higher ACTH, cortisol, and norepinephrine rises, in comparison with less aggressive behavior.

Dysliking emotions, evoking fear and a possible worry about a fighting condition, were able to induce hypothalamic-pituitary-adrenal axis and catecholamines higher responses in comparison with liking emotions, in spite of similar arousal levels.

Aggressiveness levels in subjects with a history of substance abuse, or positive familial history for alcoholism, were found related with cortisol, ACTH and norepinephrine responses.

In conclusion, sympatho-adrenergic system appears closely involved in human defensive strategies, with an anticipatory mechanism that includes hormonal rise before open fighting and in relationship with aggressive temperamental trait.

HORMONAL CONTROL OF COPULATION AND PREOPTIC DOPAMINE IN MALE RATS

Hull Elaine M.*, Putnam Susan K., Sato Satoru, Du Jianfang

Department of Psychology, State University of New York at Buffalo, Buffalo, NY 14260-4110, USA

Dopamine (DA) is released in the medial preoptic area (MPOA) of male rats in the presence of a receptive female and during copulation. MPOA DA increases sexual motivation, copulatory rate, and

coordinates genital reflexes. Testosterone (T) is necessary for DA release in the MPOA during basal conditions and in response to a female. T can be metabolized to either estrogen (E) or dihydrotestosterone (DHT), which bind to estrogen and androgen receptors, respectively, with greater affinity than T.

We administered T, E, DHT, E+DHT, or oil vehicle to castrated male rats. Extracellular DA levels were measured in dialysate from the MPOA, before and during copulation, using capillary high performance liquid chromatography (HPLC) with electrochemical detection. E, T, and E+DHT maintained normal-to-high basal DA levels; DHT and oil treatments did not maintain copulation or basal or female-stimulated DA release. Although E maintained intromissions and the highest basal DA levels, there was no increase in extracellular dopamine during copulation, and no E-treated male ejaculated. Both T and the combination of E+DHT supported full copulatory behavior and the DA increase in response to the female. There were numerous significant correlations between copulatory measures and extracellular DA.

In conclusion: 1) DHT-alone is ineffective in maintaining copulation or MPOA DA release. 2) E is necessary and sufficient for maintaining intromissions and basal DA, but not for ejaculations and female-stimulated DA release. 3) T and E+DHT fully maintained all measures. 4) Extracellular DA is closely related to copulatory ability in male rats.

Supported by NIH grant MH40826 to EMH

EXPERIMENTAL ANOSMIA AND ANXIETY: CRH-RELATED MECHANISMS?

Kalueff A. V.*, Makarchuk N. E., Maisky V. A., Pilyavsky A. I.

Centre for Physiology and Biochemical Research, Kiev 01042, Ukraine

Earlier we established that short-term peripheral anosmia demonstrates anxiety-like behavioural profile in the open field paradigm in rats (Makarchuk, Kalueff, 2000). Our current research deals with the question as for which brain structures, especially within hypothalamic-pituitary axis, might underlie such response. Study of an early-response gene *c-fos* activation regional distribution in the brain has been proved to be a useful tool in the mapping of functional neuronal pathways activated following stress response.

Experiments were carried on 8 white male albino rats. Anosmic rats (n = 4) received intranasal