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Title: The role of central and medial amygdala in normal and abnormal aggression: a review of classical approaches

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TITLE PAGE

Title: The role of central and medial amygdala in normal and abnormal aggression: a review of classical approaches

Running title: Amygdala and aggression

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Highlights

- The medial and central amygdala control male rivalry and predatory aggressions, respectively
- Both nuclei are recruited by violent aggression performed under conditions of hypoarousal
- Maternal and certain abnormal aggressions fall in the category described by the previous point
- Abnormal aggression performed under conditions of high physiological arousal and behavioral agitation upregulates specifically the medial amygdala
- Mechanisms underlying various forms of aggression show considerable differences

Abstract

The involvement of the amygdala in aggression is supported by overwhelming evidence.

Frequently, however, the amygdala is studied as a whole, despite its complex internal organization. To reveal the role of various subdivisions, here we review the involvement of the central and medial amygdala in male rivalry aggression, maternal aggression, predatory aggression, and models of abnormal aggression where violent behavior is associated with increased or decreased arousal. We conclude that: (1) rivalry aggression is controlled by the medial amygdala; (2) predatory aggression is controlled by the central amygdala; (3) hypoarousal-associated violent aggression recruits both nuclei, (4) a specific upregulation of the medial amygdala was observed in hyperarousal-driven aggression. These patterns of amygdala activation were used to build four alternative models of the aggression circuitry, each being specific to particular forms of aggression. The separate study of the roles of amygdala subdivisions may not only improve our understanding of aggressive behavior, but also the

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