

Abusive mothering aggravates the impact of stress hormones

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In a new *Biological Psychiatry* article, Dr. Regina Sullivan and colleagues have dissected the behavior of mother rats and their infant pups, modeling nurturing by stroking and abuse with electric shock. In this animal model of infant abuse, they took into consideration the unique infant neurobehavioral learning attachment system that ensures infant rats' attachment to their caregiver regardless of the quality of care received.

Upon this background, the pups responded to a natural maternal odor or an artificial odor that was conditioned as a new maternal odor through pairings with either a positive stimulus (the stroking) or a negative stimulus (the shock). Exposure to both their mother's natural scent and the conditioned maternal scent evoked normal social responses, including those related to attachment.

The authors also evaluated the impact of raising the pups' levels of the stress hormone corticosterone, or being reared with an abusive mother. In these cases, pups with an abusive attachment showed disrupted social behavior with the mother and increased engagement of the amygdala, a region of the brain involved in regulating stress and emotion.

"Our work shows that, while the infant brain is wired to form attachments at all costs, abusive attachments have negative consequences in [social behavior](#) development," explained Dr. Rainecki. "Most importantly, some effects of early life abuse may be hidden until the abused animal is challenged and the negative effects are uncovered."

Dr. John Krystal, Editor of [Biological Psychiatry](#), also commented, "It is interesting that the [amygdala](#) is primarily activated when abusive behavior of the mother is combined with a reaction within the infant, i.e., an increase in levels of the stress hormone corticosterone. Thus, the authors of this study elegantly highlight the dyadic nature of the mother-infant relationship."

Using this model of attachment may provide clues to understanding attachment in children with various conditions of care. The authors hope that this model will help us understand the neurobiological origins of psychopathology stemming from abuse, and possibly facilitate the development of treatments and/or interventions for victims of early-life trauma.

More information: The article is "Developing a Neurobehavioral Animal Model of Infant Attachment to an Abusive Caregiver" by Charlis Raineke, et al. The article appears in *Biological Psychiatry*, Volume 67, Issue 12 (June 15, 2010).

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