DOWNLOAD PDF NEUROBIOLOGY OF AGGRESSION IN CHILDREN R. JAMES R. BLAIR . [ET AL.]

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R. James R. Blair Abstract | Conduct disorder is a childhood behaviour disorder that is char acterized by persistent aggressive or antisocial behaviour that disrupts the child' s environment and.

Abstract Acts of violence account for an estimated 1. While violence can occur in many contexts, individual acts of aggression account for the majority of instances. In some individuals, repetitive acts of aggression are grounded in an underlying neurobiological susceptibility that is just beginning to be understood. An imbalance between prefrontal regulatory influences and hyper-responsivity of the amygdala and other limbic regions involved in affective evaluation are implicated. Human aggression and violence are, unfortunately, ubiquitous phenomena with substantial costs to our society. The detrimental effects of aggression and violence are documented daily in the media. Aggressionâ€”defined as hostile, injurious, or destructive behavior often caused by frustrationâ€”can be collective or individual. The mental health professional is often called upon to evaluate pathological forms of individual aggression in the clinical, forensic, and school setting, yet the causes and treatment of pathological aggression and violence are poorly understood and understudied 1. While the underpinnings of human aggression are clearly multifactorial, including political, socioeconomic, cultural, medical, and psychological factors, it is also clear that some forms of pathological aggression, such as impulsive aggression which occurs in the context of emotional arousal and provocation , have an underlying neurobiology that we are only beginning to understand. In this overview, after defining aggression, its prevalence, and its phenomenology, we will address the neurobiology of aggression, particularly pathological forms of impulsive aggression, by discussing the circuitry, both cortical and subcortical, as well as the role of neuromodulators in the initiation and suppression of aggression. Definitions of Aggression Aggression may be classified in a number of ways, for example, by the target of aggression e. The most widely utilized and perhaps most heuristically valuable classification of aggression is that of premeditated versus impulsive aggression. Premeditated violence represents a planned behavior that is not typically associated with frustration or response to immediate threat. This form of aggression has also been termed predatory, instrumental, or proactive 2 â€” 4. Premeditated violence is not invariably accompanied by autonomic arousal and is planned with clear goals in mind. Sometimes this form of aggression is socially sanctioned, as in wartime. In contrast, impulsive aggression is characterized by high levels of autonomic arousal and precipitation by provocation associated with negative emotions such as anger or fear 2 , 3. It usually represents a response to a perceived stress. Impulsive aggression, also referred to as reactive aggression, affective aggression, or hostile aggression, becomes pathological when aggressive responses are exaggerated in relation to the emotional provocation that occurs. When a threat is dangerous and imminent, this unpremeditated aggression might be considered defensive aggression and thus part of the normal repertoire of human behavior. Therefore, the line between pathological and impulsive aggression and more normal forms of aggression is not hard and fast, and individuals with pathological aggression may experience or rationalize their violence or aggression as being within the boundaries of normal protective or defensive aggression. Epidemiology and Genetics A recent World Health Organization report provided a 1-year worldwide estimate of 1. Acts of episodic or intermittent impulsive aggression are characteristics of intermittent explosive disorder, as determined by integrated research criteria, which has a lifetime population prevalence of 7. It has been reported that one-quarter of all men and approximately one-half as many women report acts of physical aggression after age 18 7. Gene-environment interactions play a major role in aggression and antisocial behaviors 8 , Environmental factors comprise familial factors, including observing or experiencing aggression as a child or adolescent, as well as cultural and socioeconomic factors that are conducive to aggression 13 â€” Individuals with a biological risk for aggression may be particularly vulnerable to the effect of psychosocial adversity For example, genes for the serotonin transporter and monoamine oxidase type A MAO-A interact with childhood maltreatment and adversity to predispose to violence 17 â€” Episodic and impulsive verbal

and physical aggression can be associated with a variety of psychiatric disorders and are frequently seen in personality disorders, such as borderline and antisocial personality disorders. The consequences of these behaviors can be serious and include spousal abuse and injury, job loss, criminal assault, rape, or murder. Phenomenology As illustrated in Figure 1 , the susceptibility to aggression may manifest differently depending on the broader psychopathological context in which it occurs. When the susceptibility is associated with coexisting cognitive impairment or disorganization with impairment of reality testing, aggression may be manifest in psychotic or highly deviant behaviors, as in murder, rape, and serial killings. When such a susceptibility to aggression occurs in an individual predisposed to anxiety who is later exposed to trauma, aggressive acts may be observed when triggered by cues that evoke the original trauma, as in the context of posttraumatic stress disorder PTSD. When coupled with extreme emotional sensitivity and dysregulation, impulsive or reactive aggression often occurs in an interpersonal context, as in borderline personality disorder. A susceptibility to aggression may be enabled by an altered mood or anxiety state, as in bipolar disorder, generalized anxiety disorder, or panic disorder Episodic aggression and violence often accompany dementia. Perhaps the most common comorbidity is a substance abuse disorder, which contributes to both the cognitive distortions and disinhibition associated with substances of abuse, such as alcohol or stimulants.

Chapter 2 : Biology of Aggression - Oxford Scholarship

This chapter reviews neurobiological risk factors for aggression in children. It begins by considering two general positions that have received considerable attention with respect to aggression in children: the frontal lobe and fear dysfunction positions.

See other articles in PMC that cite the published article. A proportion of children with conduct disorder have psychopathic traits. Psychopathic traits consist of a callousâ€”unemotional component and an impulsiveâ€”antisocial component, which are associated with two core impairments. The first is a reduced empathic response to the distress of other individuals, which primarily reflects reduced amygdala responsiveness to distress cues; the second is deficits in decision making and in reinforcement learning, which reflects dysfunction in the ventromedial prefrontal cortex and striatum. Genetic and prenatal factors contribute to the abnormal development of these neural systems, and socialâ€”environmental variables that affect motivation influence the probability that antisocial behaviour will be subsequently displayed. Aggressive and antisocial behaviours are the leading cause of child and adolescent referrals to mental health clinicians and can lead to a diagnosis of conduct disorder 1. However, not all patients receiving this diagnosis show the same pathophysiology. One form of conduct disorder is marked by the presence of psychopathic traits and will be the main focus of this Review. Psychopathic traits have a core callousâ€” unemotional component for example, lack of guilt and empathy and an impulsiveâ€”antisocial component 2. They are detectable early in childhood and persist into adulthood 3 , 4. Clinically, understanding psychopathic traits is important, as their presence can interfere with socialization 5 and currently available conduct-disorder treatments 6 , 7. There has been rapid progress in our understanding of the neurobiology of psychopathic traits, particularly the callousâ€”unemotional component, over the past 5 years. To qualify for this specifier, an individual must have displayed two of four characteristics in the previous 12 months in multiple settings. These characteristics are lack of remorse or guilt; callousness that is, lack of empathy ; lack of concern about performance for example, at school ; and shallow or deficient affect a lack of expression of feelings to others. A different form of conduct disorder is associated with increased risk of mood and anxiety disorders and emotional lability BOX 1. Box 1 Different forms of conduct disorder Patients receiving a diagnosis of conduct disorder do not all have the same pathophysiology. One set of neurodevelopmental impairments â€” decreased amygdala responsiveness to distress cues and decreased striatal and ventromedial prefrontal cortex vmPFC sensitivity to reinforcement signals that are critical for successful decision making FIG. Another set of dysfunctions can also lead to a diagnosis of conduct disorder, as explained below. Mammals demonstrate a graded and instinctual response to threat: Reactive aggression involves unplanned, enraged attacks on the object perceived to be the source of the threat or frustration. Animal studies have shown that reactive aggression is mediated by a circuit that runs from the medial amygdala, largely via the stria terminalis to the medial hypothalamus, and from there to the dorsal half of the periaqueductal grey PAG â€” This circuitry is assumed to mediate reactive aggression in humans as well see the figure. Certainly, several recent functional MRI studies have identified these regions to be involved in defensive reactions to threat in humans â€” This circuitry is assumed to be regulated by frontal cortical regions, particularly the vmPFC and, potentially, regions of the anterior cingulate cortex ACC. If the basic threat circuit amygdalaâ€”hypothalamusâ€”PAG is overly responsive, either because of prior priming or inadequate regulation, the individual is more likely to respond to a threat with reactive aggression than with freezing or flight In youths with conduct problems and low callousâ€”unemotional traits, this circuit is overly responsive, as evidenced by, for example, increased amygdala responses to fearful expressions Moreover, they are more likely to display higher levels of threat-based and frustration-based reactive aggression Notably, a high rating for psychopathic traits which characterizes the other form of conduct disorder is typically associated with a decreased risk for anxiety and mood disorder symptoms, particularly when the relationship between anxiety on the one hand, and antisocial and impulsive behaviour on

the other hand is accounted for â€” This inverse relationship between psychopathic traits and mood and anxiety disorders is unsurprising, as increased amygdala responsiveness is also commonly associated with mood and anxiety disorders By contrast, psychopathic traits are associated with decreased amygdala responsiveness 8 , 10 , 30 , 48 â€” 50 , Open in a separate window This Review discusses why psychopathic traits in youths are associated with an increased risk of antisocial behaviour and aggression. I use a cognitive neuroscience approach; that is, I consider how specific functional impairments in specific neural systems give rise to the development of psychopathic traits. I then use cognitive neuroscience findings to interpret both data on genetic and environmental risk factors for aggression and data on potential treatment possibilities. Finally, I present an integrative model of psychopathic traits, conduct disorder and aggression more generally. A cognitive neuroscience approach Youths with psychopathic traits show two main cognitive impairments. The first is a specific form of empathic dysfunction. Indeed, the clinical literature has long associated psychopathy with empathy impairment 12 , However, the term empathy subsumes two critical processes that are distinct at both the cognitive and the neural level Psychopathic traits are not associated with reductions in cognitive empathy but they â€” and particularly the callousâ€”unemotional component â€” are associated with reductions in specific forms of emotional empathy in particular, responding to the fear, sadness, pain and happiness of others. This functional impairment is associated with reduced amygdala and ventromedial prefrontal cortex vmPFC responsiveness to distress cues FIG.

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Chapter 3 : Neurobiology of Aggression in Children - Oxford Scholarship

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R. James R. Blair Abstract | Conduct disorder is a childhood behaviour disorder that is characterized by persistent aggressive or antisocial behaviour that disrupts the child's environment and.

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Conduct disorder is a childhood behaviour disorder that is characterized by persistent aggressive or antisocial behaviour that disrupts the child's environment and impairs his or her functioning. A proportion of children with conduct disorder have psychopathic traits. Psychopathic traits consist.

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