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Biological correlates of intimate partner violence perpetration

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ABSTRACT

An extensive literature documents biological correlates of general aggression, but there has been less focus on biological correlates of intimate partner violence (IPV). The purpose of this review is to summarize the research literature to date that has reported on biological factors in IPV perpetration. We review the existing literature on four domains of biological processes that have been examined with respect to IPV perpetration, including: head injury and neuropsychology; psychophysiology; neurochemistry, metabolism and endocrinology; and genetics. We critique the literature, discuss the clinical relevance of research findings, and provide some recommendations for future biologically-oriented IPV research.

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1. Introduction

Efforts to understand the etiology of intimate partner violence (IPV) perpetration are critical given the scope of the IPV problem and its numerous negative impacts. According to a national survey, approximately 1.5 million women and 834,732 men are physically assaulted or raped by their intimate partner every year in the United States, with 41.5% of women injured during their most recent assault, compared to 19.9% of men (Tjaden & Thoennes, 2000). In 2005, data collected by the FBI revealed that 1181 females and 329 males were murdered by an intimate partner (Fox & Zawitz, 2007). Physical injuries, ranging from bruises to gastrointestinal disorders, are often accompanied by psychological problems including depression, post-traumatic stress disorder, low self-esteem, and harmful health behaviors such as substance abuse and risky sexual activity (Campbell et al., 2002; Coker et al., 2002; Plichta, 2004). Moreover, the annual cost of medical care, mental health services, and lost employment

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productivity due to IPV has been estimated at more than $8.3 billion (Max, Rice, Finkelstein, Bardwell, & Leadbetter, 2004; National Center for Injury Prevention and Control, 2003). IPV-related criminal justice service use is also significant, including police and investigative costs, prosecutors, courts, legal fees (public defenders), and incarcerations (Miller, Cohen, & Wiersema, 1996), though nationally representative cost estimates are not available (National Center for Injury Prevention and Control, 2003).

IPV perpetration has been studied from different perspectives. Bell and Naugle (2008) recently reviewed and critiqued the most established theoretical explanations of IPV perpetration. Feminist theories argue that socially-defined gender roles within patriarchal societies in combination with men's systematic efforts to control women through the use of power and domination are the main causes of IPV (Dobash & Dobash, 1979; Walker, 1984). Power theorists posit that violence stems from within the family; violence used to resolve family conflicts is learned in childhood by witnessing or experiencing abuse. Furthermore, psychosocial stressors (e.g. power imbalances between spouses) increase the risk of IPV (Straus, 1976;1977). Social learning theories hold that violence develops when individuals model parental behavior and fail to learn constructive conflict resolution methods (O'Leary, Van Hasselt, Morrison, Bellack, & Hersen, 1988). Personality theories emphasize the roles of insecure attachment styles, early childhood family experiences, impulsivity, and borderline, antisocial, and narcissistic traits in IPV perpetration (Dutton, 1995; Holtzworth-Munroe & Stuart, 1994). Notably absent are the potential contributions of physiological factors, despite the fact that they constitute one leg of the bio-psych-social trinity, so often invoked to explain human behavior.

The contribution of a biological perspective to IPV perpetration has received limited attention despite a well-characterized body of literature on the relationship between biological factors and general aggression (for reviews, see Miczek et al., 2007; Patrick, 2008; Raine, 2002; Siever, 2008). A recent meta-analytic review of IPV risk factors did not include any biological variables (Stith, Smith, Penn, Ward, & Tritt, 2004). The extant research in this area underscores the need to include biological factors in theorizing and model building regarding the causes of IPV.

Furthermore, interventions for abusers based on a psychological and social understanding of IPV perpetration have not generally been successful. A meta-analytic review on the efficacy of abusers' treatment on recidivism of IPV found a small effect size (Babcock, Green, & Robie, 2004). This quantitative summary of controlled studies utilizing victim reports or police records of physical violence post-treatment indicated that therapeutic interventions had a minimal impact on reducing recidivism beyond legal ones. Developing a biological understanding of perpetration may ultimately serve to bolster program effectiveness.

To our knowledge, the current paper is the first literature review focusing on the association between biological factors and the perpetration of IPV. We searched MEDLINE, PsycINFO, and PubMed, from inception of the databases through January 2008. For each literature search, we combined every intimate partner abuse term, such as *intimate partner abuse, intimate partner violence, relationship abuse, and relationship aggression*, with every subtopic search term. For head injury and neuropsychology, search terms included *neuropsychology, neuropsychological, cognition, head injury, and traumatic brain injury*. For psychophysiology, search terms included *reactivity, physiological reactivity, psychophysiology, and cardiovascular reactivity*. For neurochemistry, metabolism, endocrinology, we used the terms *serotonin, testosterone, and hypothalamic pituitary axis*. For genetics, we used the terms *genetics, gene, DNA, allele, heredity, inheritance, behavioral genetics, nature nurture, twin studies, lineage studies, genetic markers, polymorphisms, chromosomes, polygenic, multifactorial, DRD4 gene locus, serotonin transporter gene, markers, and linkage analysis*. We also searched the bibliographies of located articles for further references. Having identified ten empirical investigations relevant to head injury and neuropsychology, six empirical investigations that addressed psychophysiology, five empirical studies concerning neurochemistry, metabolism, and endocrinology, and one empirical study on genetics, evidence summarizing the biological processes that underlie IPV perpetration were divided into each of these four domains. A discussion of suggestions for future biologically-oriented research is provided. Given the lack of research on the biological underpinnings of female-perpetrated IPV, our emphasis is on male-perpetrated IPV.

2. Head injury and neuropsychological factors for IPV

Rosenbaum and Hoge (1989) conducted the first empirical evaluation of head injury in men who engage in IPV. Study participants, all of whom had physically abused their female partner, were self-referred or court-mandated to an outpatient, hospital-based psychoeducational program for with problems of aggression in marital relationships. A concussion, as diagnosed by a physician, or a loss of consciousness (LOC), as reported by a participant, defined a significant head injury. It was found that 19 out of the 31 participants (61%) had positive histories of head injury. This rate was considerably higher than the authors' estimated 6% prevalence rate of head injury in the general population. Head injured participants had a mean age at injury of 16.1 ± 5.2 yrs, with LOC ranging from several minutes to several months. Predictors of head injury examined in this study included childhood abuse, general aggression, and alcohol and drug use. Only alcohol abuse was significantly associated with experiencing head injury. Since alcohol use is also significantly associated with IPV (perpetration and victimization) (Foran & O'Leary, 2008), it is possible that alcohol use functions as a third variable, increasing the probability of both head injury and IPV. However, it is also possible that alcohol abuse leads to IPV in part because alcohol abuse increases the likelihood of experiencing head injury. Future longitudinal research is needed to clarify the relationship between alcohol abuse, head injury, and IPV.

In a second study, Rosenbaum et al. (1994) compared the head injury rates of 53 partner-abusive men to those of two non-violent groups, 32 maritally discordant and 45 maritally satisfied men. Group membership was based on cut off scores on the Conflict Tactic Scales (CTS; Straus, 1979). The latter two groups were added to this study to serve as control groups, which had been absent in the first study. The researchers found that 53% of abuse perpetrators had a history of closed head injury compared to 25% and 16% of discordant and satisfied men, respectively, suggesting that marital discord could not account for the association between head injury and abuse. An overwhelming majority (93%) of head-injured abusers had endured their head injury prior to the first occurrence of marital abuse, with 74% of these men receiving the head injury before the age of 16. The three groups of participants did not differ significantly on severity of head injury, perhaps due to the fact that most of the head injured men (67%) reported mild injury, and the groups also did not differ on alcohol use or childhood abuse. When comparing abusers with non-abusers (discordant and satisfied combined; discordant alone), having had prior head injury, regardless of severity, appeared to increase the likelihood of being an abuser six-fold.

Marsh and Martinovich (2006) attempted to replicate and extend findings from Rosenbaum and colleagues by investigating the prevalence of head injury among abusers in addition to studying abusers' executive dysfunctions and general intellectual functioning. Of the 38 abusers, 22 (58%) reported at least one head injury, consistent with the rates reported by Rosenbaum and Hoge (1989) and Rosenbaum et al. (1994). To determine the rate of executive impairments associated with head injury, these researchers administered three measures of executive functioning: the Behavioral Assessment of the Dysexecutive Syndrome (BADS; Wilson, Alderman,