

Toward Understanding the Biology of Crime in Trinidad and Tobago

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ABSTRACT

Serious crime is a scourge within Trinidad and Tobago's borders and seems to be escalating yearly with no resolution in sight. It is commonplace for governments to view/implement policies targeting crime based on sociological and psychological paradigms. What is most often overlooked, however, is that crime has unique biological underpinnings, which, if characterized, could lead toward clinical interventions that could mitigate its incidence within the population.

Keywords: Biology, crime, environment, genetics, impulsive aggression, interventions

Hacia la Comprensión de la Biología del Crimen en Trinidad y Tobago

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RESUMEN

Los crímenes graves son un flagelo dentro de las fronteras de Trinidad y Tobago, y parecen estar escalando anualmente sin que exista solución alguna a la vista. Es común que los gobiernos conciban e implementen las políticas dirigidas contra el crimen a partir de paradigmas sociológicos y psicológicos. Sin embargo, muy a menudo se pasa por alto que el crimen tiene causas biológicas subyacentes únicas, las cuales – de caracterizarse – podrían llevar a intervenciones clínicas que podrían mitigar su incidencia en la población.

Palabras claves: Biología, crimen, medio ambiente, genética, agresión impulsiva, intervenciones

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INTRODUCTION

It is commonplace (and to a great extent expected) to consider crime as a major issue among the population of Trinidad and Tobago and, indeed, the Caribbean. Suffice to say that, if questioned, no single individual can remark that he/she has never been a victim of criminal activity in some form or fashion. I, myself, have been the victim of serious crimes on no less than four occasions. The murder rate in Trinidad and Tobago increased just over a hundred per cent over the last decade. In 2002, the nation's murder rate was 13.2 and in 2012 it climbed to 29.2 per 100 000. This has led the United Nations Development Programme (UNDP) 2011 report to compare our twin-island state to war-torn Baghdad and the Trinidad Express newspaper carrying the following headline on September 10, 2011: "POS the new Baghdad" (1). The government and protective services have continuously focussed on social and punitive measures in an attempt to

mitigate criminal activity and, indeed, its effects on a population gripped by fear.

Sociologists provide us with a wide range of different theoretical perspectives with which to view our social world. These include the three major theoretical perspectives: the functionalist perspective, the conflict perspective, and the symbolic interactionist perspective [sometimes called the interactionist perspective, or simply the micro view] (2).

Psychologists, on the other hand, present a number of different perspectives on the causes of crime, paying particular attention to theories exploring the relationship between crime and individual personality, social factors, cognition and developmental factors. These theories focus differently when regarding individuals, family, group and societal psychology (3–5).

Interventions which are subsequently based on these psychological perspectives include: early intervention programmes in health and education that support the healthy development of children; the support of positive parenting practices, which have been shown to have a strong correlation to the reduction in risk-taking, as well as antisocial behaviour, alcohol and other substances of abuse by adolescents. From the sociological perspective, interventions

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include: programmes to address multi-generational employment for a particular group, or in a particular area, programmes that build cultural identity and positive community values to lift self-esteem and strengthen social connectedness, and, finally, anti-family violence programmes that attempt to change the “norms” and behaviours in relation to family violence (6–10).

Indeed, what seems to not have been considered, at least locally (and maybe should be foremost) in the implementation of strategies to mitigate crime and/or criminal activity, is the consideration that crime has a distinct biological component, which (more than likely) would have a distinct influence on the interventions employed.

Impulsive aggression

Monoamine oxidase A (MAOA) is a key isoenzyme that degrades biogenic and dietary amines, preferentially oxidizing serotonin (5-hydroxytryptamine; 5-HT), norepinephrine (NE), and dopamine [DA] (11). A functional polymorphism in the promoter region of the MAOA gene has been found to be associated with a broad range of antisocial phenotypes, including physical violence (12). At the same time, it is well known that gang members represent some of the most serious violent offenders (13). The low-activity alleles of the gene are associated with various psychopathologies which incorporate maladaptive behaviours, cognitive dysfunctions, and criminal behaviours, including Brunner syndrome (14).

Impulsive aggression is characterized by an inability to regulate affect as well as aggressive impulses, and is highly co-morbid with other mental disorders including depression, suicidal behaviour and substance abuse. Many reviews suggest that dysfunctional interactions between serotonin and dopamine systems in the prefrontal cortex may be an important mechanism underlying the link between impulsive aggression and its co-morbid disorders. Specifically, serotonin hypofunction may represent a biochemical trait that predisposes individuals to impulsive aggression, with dopamine hyperfunction contributing in an additive fashion to the serotonergic deficit (15).

This underlying disposition can be manifested behaviourally as impulsive aggression toward oneself and others, and as depression under precipitating life stressors. Substance abuse associated with impulsive aggression is also understood in the context of dopamine dysregulation resulting from serotonergic deficiency (16).

Impulsive aggression plays a critical role in the manifestation of violent and criminal behaviour and is considered an important psychopathological symptom of several mental disorders including borderline and antisocial personality disorders. Previous research has reported associations among impulsive aggression, mood disorders, substance abuse and suicidality, which suggest that these co-morbid disorders have a common biological substrate. One

of the problems in the neurobiology of impulsive aggression is the identification of common biological correlates for these co-morbid disorders as well as differentiation among these varying co-morbid conditions (17).

Impulsive aggression, therefore, is a complex behavioural phenotype and multiple brain systems may contribute to its aetiology and its high co-morbidity with other disorders. The association between impulsive aggression and its co-morbid disorders may result from biological predisposing factors, such as an imbalance among the functions of different neurochemical systems, or dysfunction in activities of executive brain regions. Specifically, low levels of the neurotransmitter serotonin have been associated with impulsive aggression in both human and animal studies (18). A number of studies indicate that serotonin and dopamine systems interact closely at a basic neurophysiological level and that impairment of the serotonin system function can lead to dysregulation of the dopamine system (19–21).

The Institute of Crime Prevention and Problem Solving (ICPPS)[®] has embarked on the examination and characterization of the association between MAOA and gang membership, as well as perpetrators of violent crimes in Trinidad and Tobago. In an effort to elucidate the neurobiological underpinnings of impulsive aggression and to help account for its connections with these other disorders, these biological factors are being characterized in individuals who engage in crime and individuals who do not engage in crime. Characterization of these chemicals in different groups and correlation with other social characteristics and data should confirm a relationship to criminal behaviour/activity.

Environmental and genetic factors

There is also growing recognition that antisocial behaviours are produced by a combination of environmental and genetic factors (22–24). Research has revealed that environmental and genetic factors work interactively and often moderate the effects of the other. Gene-environment interactions in the current study will be examined to determine whether neighbourhood disadvantage interacts with two dopamine receptor genes [DRD2 and DRD4] (25), among others, to predict three different antisocial measures: adolescent victimization, contact with delinquent peers, and involvement in violent delinquency.

Historically, social science research has had a tendency to either ignore or reject the evidence that genes matter in understanding human phenotypes, especially antisocial behaviours and traits. This approach has often resulted in a partition between environmental and genetic risk factors that has restricted understanding of how social contexts influence biological processes that contribute to human differences. At the institute, we recognize the various ways that genes and environments interlock to produce human variation.

It is hoped that our findings will add to the development of a holistic crime plan that incorporates clinical as well as social intervention strategies to quell the growing scourge

of crime in our twin-island republic and, once successful, convey these strategies to Caribbean counterparts.

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