The Association between Suicidality and Impulsivity among Adolescents with Substance use Disorders

Thesis

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Emad Abdelwahab Elghamrawy

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List of Abbreviations

ACC	:	Anterior cingulate cortex
ADHD	:	Attention Deficit Hyperactivity Disorder
ALE	:	Activation likelihood estimation
AUDADIS	:	Alcohol Use Disorder and Associated Disabilities Interview Schedule
BIS 11	:	The Barratt Impulsiveness Scale 11
BPD	:	Borderline personality disorder
CD	:	Conduct Disorder
CGT	:	Cambridge Gambling Task
COMM	:	Current Opioid Misuse Measure
CSF	:	Cerebrospinal fluid
DA	:	Dopamine
DSM-IV	:	Diagnostic and Statistical Manual, Fourth Edition
DZ	:	Dizygotic
EPQ	:	Eysenck Personality. Questionnaire
GABA	:	Gamma-Aminobutyric Acid
GM	:	Gray matter
HPA	:	Hypothalamic-Pituitaryadrenal axis
HTR1B	:	5-hydroxytryptamine receptor 1B
MAOA	:	Monoamine-oxidase A

MDD	**:**	Major depressive disorder
MECA	**:**	Methods for the Epidemiology of Child and Adolescent Mental Disorders
MINI-KID	**:**	the Mini International Neuropsychiatric Interview for Children and Adolescents
MPQ	**:**	Multi- dimensional Personality Questionnaire
MZ	**:**	Monozygotic
NAcc	**:**	Nucleus accumbens
NARI	**:**	Noradrenaline re-uptake inhibitor
NAS/NCR	**:**	the National Academy of Sciences/National Research Council
NMFS	**:**	National Mortality Followback Survey
NUPM	**:**	Nonmedical use of prescription medications
OFC	**:**	Orbitofrontal cortex
OR	**:**	Odds of ratio
P	**:**	indicate level of significance
R	**:**	Spearman Correlation Test
SOS	**:**	Signs of Suicide
SPSS	**:**	Statistical Package for Social Sciences
SSRT	**:**	Stop-signal reaction-time
T	**:**	Independent sample t-test
TCI	**:**	Temperament and Character Inventory

TPH2	**:**	Tryptophan hydroxylase 2
WM	**:**	White matter
$\mathbf{x^2}$	**:**	Pearson chi square test
5 CSRTT	**:**	Five-choice serial-reaction time task
5-HIAA	**:**	5-hydroxyindoleacetic acid
5HT	**:**	5 hydroxytyramine

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Introduction

The transition from childhood to adolescence is characterized by important biological, cognitive, emotional and social changes. This period is heavily marked by the onset of and progression through puberty, greater autonomy and less self-regulation, and changes in parental and peer relationships ***(Castellanos-Ryan et al., 2013).***

Epidemiological studies across the life span have shown that adolescence is an important developmental period for the onset of substance-use and misuse, with some considering exploratory drug use as normative during this period. Canadian statistics show that more than 60% of illegal drug users are aged 15-24 years of age and that, depending on the province, 19-30% of 12-18 year olds report binge drinking in the past month, and 17-32% report using cannabis in the past year ***(Young et al., 2011)***.

Suicidal behavior and substance use disorders (SUD) represent significant public health problems among adolescents and adults. Moreover, they tend to co-occur at relatively high rates in psychiatric populations, which increases risk for mortality. Reviews of the adolescent suicide literature suggest that up to 50% of adolescents who

engage in suicidal behavior have a SUD. Further, SUDs have been associated with a 6- to 8.5-fold increase in risk of completed suicide and 3- to 4-fold increase in risk of attempted suicide ***(Esposito-Smythers & Spirito, 2004).***

Suicide represents a leading cause of death in young people, yet relatively little is known regarding the neur obiological sequelae of preceding suicidal thoughts and behaviours. Although some studies have reported cognitive deficits associated with suicidality, very few studies have been undertaken in young people, especially from non-clinical contexts ***(Chamberlain et al., 2012).***

Suicidality spans a spectrum that ranges from suicidal thoughts (thoughts about wanting to be dead) to suicidal acts (self-destructive behaviours with at least some intent to end one's life). Approximately 10–18% of population across diverse countries report suicidal ideation and 3–5% have made a suicide attempt at some point in their life. In the Arab culture, suicidal behaviour is stigmatized and an expressed hostility to the suicidal patient is the usual reaction. The prevalence of suicidal ideation in Arab general populations has been rarely explored Some studies have attempted to evaluate the extent of the phenomenon in non-representative population samples by recruiting in the health care services or in specific populations ***(Agoub et al., 2005).***

Suicidal behavior and SUDs appear to be functionally interrelated, though the nature of this relationship may vary across individuals ***(Bagge & Sher, 2008).*** For example, for some individuals, SUD and suicidality maybe temporally related. The acute effects of intoxication may heighten psychological distress, increase aggressiveness (toward self and others), enhance suicide-specific SUD expectancies (e.g., "alcohol will give me the courage to make a suicide attempt"), and inhibit the generation and implementation of adaptive coping strategies. Among individuals contemplating suicide, these events maybe sufficient to propel suicidal thoughts into action***.(Esposito-Smythers et al., 2012).***

Impulsivity is a multidimensional construct that has been suggested as a vulnerability factor for several psychiatric disorders, especially addiction disorders ***(Tilmann et al., 2014).***

Research clearly establishes a link between impulsivity and alcohol use in both humans and animals, with data indicating bidirectional relationships ***(Dick et al., 2010).***

Rationale of the work

According to the latest national research of addiction in Cairo (2011) the rate of occasional use of alcohol and substance among adolescents is 8.6% while regular use is 8% and substance use disorders are 6%.Adolescent suicidal behaviors and substance use are disturbingly common. Research suggests overlap of some of the etiological mechanisms for both. Yet clear understanding of the complex relations between these behaviors and their causal underpinnings is lacking. A growing body of evidence and diathesis model highlight the importance of impulse control as a proximal risk factor for adolescent suicidal and substance use behaviors ***(Mann, 2002)***.

Hypothesis

The hypothesis of this study is that there is an association between suicidality and impulsivity in adolescents with substance use disorders.