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Comorbid sleep disorders and suicide risk among children and adolescents with bipolar disorder

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ABSTRACT

Children and adolescents with bipolar disorder are at increased risk for suicide. Sleep disturbances are common among youth with bipolar disorder and are also independently implicated in suicide risk; thus, comorbid sleep disorders may amplify suicide risk in this clinical population. This study examined the effects of comorbid sleep disorders on suicide risk among youth with bipolar disorder. We conducted secondary analyses of baseline data from the Treatment of Early Age Mania (TEAM) study, a randomized controlled trial of individuals aged 6—15 years (mean ± SD = 10.2 ± 2.7 years) with *DSM-IV* bipolar I disorder ($N = 379$). Sleep disorders (i.e., nightmare, sleep terror, and sleepwalking disorders) and suicide risk were assessed via the WASH-U-KSADS and the CDRS-R, respectively. We constructed uncontrolled logistic regression models as well as models controlling for trauma history, a generalized anxiety disorder (GAD) diagnosis, and depression symptoms. Participants with a current comorbid nightmare disorder versus those without were nearly twice as likely to screen positive for suicide risk in an uncontrolled model and models controlling for trauma history, a GAD diagnosis, and depression symptoms. Neither a current comorbid sleep terror disorder nor a sleepwalking disorder was significantly associated with suicide risk. This pattern of findings remained consistent for both current and lifetime sleep disorder diagnoses. Youth with bipolar I disorder and a comorbid nightmare disorder appear to be at heightened suicide risk. Implications for assessment and treatment are discussed.

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1. Introduction

Suicide is a leading cause of death among children and adolescents (Centers for Disease Control and Prevention [CDC], 2017). Robust evidence suggests that children and adolescents with bipolar disorder are at markedly increased risk for suicide (Brent et al., 1993; Brent and Mann, 2005; Geller et al., 2008, 2004; Goldstein et al., 2005; Hauser et al., 2013; Inder et al., 2016; Kochman et al., 2005). A recent systematic review of 14 studies

examining suicidal thoughts and behaviors among youth with bipolar disorder found weighted mean averages of current suicide ideation and attempts in this population to be 50.4% and 25.5%, respectively (Hauser et al., 2013). These prevalence rates starkly contrast with past-year rates of suicide ideation (17.7%) and attempts (8.6%) found among the general youth population (Kann et al., 2016). Given these high rates of suicidal thoughts and behaviors among youth with bipolar disorder, as well as the devastating consequences of suicide for families (Cerel et al., 2008), increased efforts are needed to identify and understand the associated features of bipolar disorder that may elevate suicide risk.

One associated feature of bipolar disorder that may increase suicide risk is sleep disturbances (Bernert et al., 2015; Goldstein

et al., 2008; Nadorff et al., 2013; Pigeon et al., 2012; Sjöström et al., 2007). Prominent examples of sleep disturbances include insomnia (i.e., difficulties falling and/or staying asleep, waking up too early) and nightmares (i.e., frightening dreams). Sleep disturbances are a core feature of bipolar disorder, present in both manic and depressive phases (Harvey et al., 2009). Parent-reported restless sleep and nightmares have also been found to be significantly more prevalent among youth with bipolar disorder than matched controls (Mehl et al., 2006). Though no study of which we are aware has examined sleep disturbances and suicide risk among individuals with bipolar disorder, among the general population, sleep disturbances appear to serve as a potent suicide risk factor (Bernert et al., 2015; Bernert and Joiner, 2007).

For example, Goldstein et al. (2008) examined the psychological autopsies of 140 adolescents who died by suicide and found higher rates of insomnia in the week prior to their death compared to community controls, even after controlling for the possible effects of a current affective disorder diagnosis (e.g., bipolar disorder). Regarding nightmares and suicide risk, few studies have examined samples of children and adolescents. A study of young adults found that nightmares were associated with suicidal ideation even after controlling for the effects of insomnia as well as symptoms of posttraumatic stress disorder (PTSD), anxiety, and depression (Nadorff et al., 2011). The potent effects of nightmares on suicide risk have similarly been observed among adult psychiatric inpatient samples (Sjöström et al., 2007), and of particular concern, nightmares have also been shown to predict death by suicide (Tanskanen et al., 2001).

These findings converge with a meta-analysis of 39 studies, which found that insomnia (RR = 2.84, 95% CI = 2.44–3.31), nightmares (RR = 2.61, 95% CI = 2.03–3.36), and other sleep disturbances (RR = 2.72, 95% CI = 2.00–3.70) were significantly associated with increased risk for any suicide-related outcome (i.e., suicide ideation, attempts, or fatalities; Pigeon et al., 2012). Importantly, sleep disturbances have been shown to predict suicide risk independent of one another as well as of other risk factors, including depression and hopelessness (Bernert and Joiner, 2007; Bernert and Nadorff, 2015). Thus, insomnia and nightmares provide incremental information regarding suicide risk (Pigeon et al., 2012; Ribeiro et al., 2012). Together, findings suggest that both insomnia and nightmares are implicated in suicide risk, including among youth (Liu, 2004; Liu and Buysse, 2006).

Given that sleep disturbances are common among youth with bipolar disorder and are also independently implicated in suicide risk, comorbid sleep disorders may augment risk for suicide. Thus, utilizing a large sample of children and adolescents diagnosed with bipolar I disorder, manic or mixed phase, the purpose of this study is to examine the relationship between current and lifetime *DSM-IV* sleep disorders and current suicide risk. The specific comorbid *DSM-IV* sleep disorders examined were nightmare disorder, sleep terror disorder, and sleepwalking disorder. Due to the nature of the data collected for the larger study from which these data were obtained, we were unable to investigate other sleep disorders, such as insomnia, which also demonstrate strong associations with suicidal thoughts and behaviors (Bernert et al., 2015; Chu et al., 2016; Pigeon et al., 2012). Since sleep disturbances, such as nightmares, are common reactions to trauma (American Psychiatric Association, 1994) and also commonly co-occur with anxiety (Alfano et al., 2007), we additionally examined the relationship between sleep disturbances and suicide risk controlling for the possible confounding effects of trauma exposure and a comorbid generalized anxiety disorder (GAD) diagnosis. In exploratory analyses, we also examined models controlling for depression symptoms (see Rogers et al., 2016, for a discussion of issues inherent in controlling for depression symptoms when examining suicidality

as the outcome variable).

2. Method

2.1. Participants and procedures

Participants were individuals aged 6–15 years (mean ± SD = 10.2 ± 2.7 years) who participated in the baseline assessment for the Treatment of Early Age Mania (TEAM) study (53.8% female; 73.6% white, 17.9% black, and 8.5% other). The TEAM study was a controlled, randomized, 8-week parallel comparison of the efficacy and tolerability of three antimanic medications (i.e., risperidone, lithium carbonate, and divalproex sodium) as an initial treatment for bipolar I disorder, mixed or manic phase (Geller et al., 2012). Participants were recruited from one of five medical centers from 2003 to 2008. Study eligibility criteria included: (1) *DSM-IV* diagnosis of bipolar I disorder, manic or mixed episode, for at least four consecutive weeks preceding the baseline assessment; (2) poor overall functioning as assessed by the Children's Global Assessment Scale (CGAS; Bird et al., 1987; i.e., a score of 60 or less at baseline); and (3) good physical health. Study exclusion criteria included: (1) IQ less than 70; (2) lifetime history of schizophrenia, pervasive developmental disorder, and/or major medical or neurological disease; (3) substance dependence, alcohol or drug abuse within the four weeks prior to baseline; (4) currently pregnant, sexually active and not using contraceptives, or nursing; (5) imminent suicide risk; and/or (6) lifetime history of receiving psychotropics being investigated in this study or their equivalents. Further details of the study methodology, including allowed polypharmacy, have been reported elsewhere (Geller et al., 2012). Consent was obtained from the caretakers and assent was obtained from the youth. All procedures were approved by the human studies committees at each site. Individuals in the present secondary analysis include all youth who met eligibility criteria and were assigned to a stratum for randomization (N = 379).

2.2. Measures

Washington University in St. Louis Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS; Geller et al., 2001, 2012). The WASH-U-KSADS is a semi-structured clinical interview administered by trained researchers to parents and children separately to assess for the presence of current and lifetime *DSM-IV* psychiatric disorders. The WASH-U-KSADS was utilized to make diagnostic determinations regarding current and lifetime bipolar I disorder (the primary inclusion criteria for the TEAM study), as well as current and lifetime sleep disorders (i.e., nightmare, sleep terror, and sleepwalking) and a current GAD diagnosis. Research has documented the reliability of the WASH-U-KSADS (Geller et al., 2001).

Further, given that the vast majority of trauma-exposed individuals report nightmares (Leskin et al., 2002), the WASH-U-KSADS was also utilized to derive an approximation of trauma exposure for utilization as a control in analyses. Specifically, the PTSD section assesses lifetime exposure to a Criterion A traumatic event. This criterion is necessary but not sufficient for a PTSD diagnosis; however, only a small proportion (i.e., 0.5%) of individuals in this sample met *DSM-IV* diagnostic criteria for PTSD, whereas a greater proportion was exposed to a Criterion A trauma (i.e., 32.5%). Thus, the variable assessing exposure to Criterion A events provides a more encompassing index of trauma exposure and, as such, was utilized as a control in logistic regression analyses.

Children's Depression Rating Scale—Revised (CDRS-R; Poznanski and Mokros, 1996). The CDRS-R is a clinician-rated assessment of depression symptoms. In this study, Item 13 was