Title:

Predicting suicidal risk in a cohort of depressed children and adolescents.

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Abstract

Background: In children and adolescents with a depressive disorder, predicting who will also go on to exhibit suicide related behaviours, including suicide attempt or self harm is a key challenge facing clinicians.

Aim: To investigate the relative contributions of depressive disorder symptom severity, hopelessness, family dysfunction, and perceived social support to the risk of suicide related behaviours.

Method: This was a cross-sectional study of a group of 10-16 year olds with major depressive disorder and dysthymic disorder.

Results: Child rated depressive disorder symptom severity emerged as the greatest predictor of risk. Hopelessness and family dysfunction were also significant predictors of suicide related behaviours. Combined these variables were strong predictors, accounting for 66% of the variance. This is a cross sectional study design, rather than longitudinal, therefore risk prediction over time was not possible.

Conclusions: Understanding the child and adolescents depressive disorder symptom severity from their perspective, their level of hopelessness as well as their family context is critical in understanding the risk of SRBs. These findings may help to provide direction for targeted interventions to address these clinical risk factors.

Introduction

The rates of death by suicide have increased in young people since the middle of last century (Wasserman, Cheng, & Jiang, 2005) and although there has been a decrease in rates since the mid 1990's (Gould, Greenberg, Velting, & Shaffer, 2003), it remains of considerable concern. Deliberate self harm (DSH), including that with the intention of dying, and suicidal ideation have also been a growing problem and are common amongst adolescents (Hawton, Rodham, Evans, & Weatherall, 2002). For example, up to 7% of secondary school students reported engaging in DSH in a 12 month period (De Leo & Heller, 2004), and at any point in time 15-25% of young people may be experiencing suicidal ideation (Grunbaum, et al., 2004).

After a history of self harm or suicide attempt (Cavanagh, Carson, Sharpe, & Lawrie, 2003), the presence of a depressive disorder or depressive symptoms is a key risk factor for future suicidal behaviour, including suicide completion (Andrews & Lewinsohn, 1992; Beautrais, 1998; Shaffer, et al., 1996). However, the prediction of those with a depressive disorder or symptoms who will go on to attempt suicide or self harm is a key challenge facing clinicians. While the risk of suicidal behaviours is similar for those with major depressive disorder and dysthymic disorder (Hetrick, Vance, & Hall, 2008), the severity of depressive disorder symptoms appears to be closely associated with suicidal behaviours (Asarnow, 1992; Brent, et al., 1986; Esposito & Clum, 2002; Hetrick, et al., 2008).

There are numerous additional risk factors for suicide. A useful model to conceptualise the relationship between the various risk factors is the stress-diathesis model (Mann, 2003) that has been summarised and simplified in a recent review (Hawton & van Heeringen, 2009). Precursors

are said to occur in the context of a diathesis, which may be one or more factors that potentially predispose someone to suicidal behaviour. The diathesis is influenced by familial and genetic factors, for example, early and current family environment and interactions (Bridge, Goldstein, & Brent, 2006; Hawton & van Heeringen, 2009). An example of a diathesis is a negative cognitive style, such as hopelessness or a tendency towards negative causal attributions, which may be influenced by poor family functioning and a lack of parental support. The onset of a depressive disorder or a stressful life event in this context is said to increase the risk for death by suicide.

Of particular interest to those researching suicide has been hopelessness. It is associated with and is a major risk factor for suicidal behaviours in adults, independent of the effect of depressive disorders (Coryell & Young, 2005; Joiner, Brown, & Wingate, 2005; Kingsbury, Hawton, Steinhardt, & James, 1999). However, the association has yet to be so clearly established in children and adolescents.

A perceived lack of social support has been shown to be predictive of suicidal behaviours in young people (Mazza & Reynolds, 1998) particularly support from the family (Lewinsohn, Rohde, & Seeley, 1993), even after the effects of depressive disorders are controlled (Lewinsohn, et al., 1993; Mazza & Reynolds, 1998). A sense of belonging to, and support from a peer group is also important, with studies showing an association between social networks and psychological and general health, as well as mortality outcomes (Giles, Glonek, Luszcz, & Andrews, 2005; Jorm, 2005). On the other hand, Greening & Stoppelbein (2002) showed that perceived lack of social support from the family was related to suicide risk, while perceived lack of support from friends was not.

Difficult family relationships and interactions, family turmoil and problems with parents have also been associated with suicidal behavior (de Wilde, Kienhorst, Diekstra, & Wolters, 1994; de Wilde, Kienhorst, Diekstra, & Wolters, 1993; Kienhorst, de Wilde, Diekstra, & Wolters, 1992; Kosky, Silburn, & Zubrick, 1986; Lewinsohn, et al., 1993). Although several studies have confirmed that this association is independent of the effects of a depressive disorder (Groholt, Ekeberg, Wichstrom, & Haldorsen, 2000; King, Raskin, Godwiski, Butkus, & Oipari, 1990), the association overall remains equivocal (Brent, Kolko, Allan, & Brown, 1990) . This may be due to parental versus child accounts of depression being used in such studies, for example, studies have shown that parents tend to report less depressive symptoms than do children (Angold, 1988).

To date, the role of perceived social support has not been extensively examined and the findings for hopelessness and family dysfunction as potential discriminating risk factors for suicidal behaviours in those who have a depressive disorder are mixed. This study seeks to use the stress-diathesis model to examine the association between depressive disorder symptom severity, hopelessness, perceived social support and family dysfunction with suicidal behaviour in children and adolescents with major depressive disorder or dysthymic disorder. The findings will contribute to the theoretical discussion of this area and potentially enable clinicians to manage young people at risk of suicide in their practice.

The hypothesis is that: 1. Young people with depressive disorders who also exhibit suicidal behaviour will have higher depressive disorder symptom severity, higher levels of hopelessness,

lower perceived social support and higher family dysfunction compared to young people with depressive disorders who do not exhibit suicidal behaviours.

Methods

Study population

This was a cross-sectional study of 59 participants conducted from 2003 to 2005 in specialist depressive disorder clinics set up in Child and Adolescent Mental Health Services in two metropolitan hospitals in Melbourne, Australia. These services are government funded and assess and manage children and adolescents from primary health care and mental health clinicians within the community. Ethics approval was obtained from the relevant Ethics committees. Participants and their families/guardians were required to provide written consent before participation.

Participants had to be between 10 to 16 years old and met DSM-IV criteria for Major depressive disorder or dysthymic disorder. Major depressive disorder and dysthymic disorder were defined by a semi-structured interview (Silverman & Albano, 1996) with the participant and the participant's parent(s) and by the participants report of depressive disorder symptom severity scores (Achenbach & Edelbrock, 1983) being greater than 1.5 standard deviations above the mean for a given participant's age and gender.

Exclusion criteria included current medication, an IQ below 70 [as assessed by the WISC-III-R], a diagnosis of pervasive developmental disorder, evidence of a major neurological condition, a psychotic disorder, bipolar disorder, or ADHD combined type.

Measures

Demographic data relevant to depression and SRBs was collected, including age, gender, a measure of social adversity (using items family income, mothers education, single parent status, sibling size and broken home status items) in the Parental Account of Childhood Symptoms (Taylor, Schachar, Thorley, & Wieselberg, 1986), and parental psychopathology (The Hopkins Symptom Checklist, HSCL) (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The psychometric properties of each measure are sound (Derogatis, et al., 1974; Taylor, et al., 1986).

The Wechsler Intelligence Scale for Children Revised (WISC-III -R) (Wechsler, 1991) provides verbal, performance and full scale IQ. It is suitable for children aged 6 to 16 years. It is a clinician-administered test involving a series of timed and untimed, verbal and non-verbal tasks.

The Anxiety Disorders Interview Schedule for Children (A-DISC) (Silverman & Albano, 1996) is a semi-structured diagnostic interview schedule based on DSM-IV criteria with child and parent versions. In each version, (1) symptoms and (2) associated impairment in academic, social and family domains are rated separately. Research findings support the clinical utility, reliability and validity of the A-DISC.

The Children's Depression Inventory (CDI) (Kovacs, 1992) consists of 27 self rated items to assess depression. Each item has a three point response set (scored 0, 1 or 2) with total scores ranging from 0 to 54, with higher scores reflecting more severe depression. It has good psychometric properties with internal consistency ranging from 0.71 to 0.87 and test-retest

reliability from 0.82 to 0.87 (Kovacs, 1992).

The Child Behaviour Checklist (CBCL) (Achenbach & Edelbrock, 1983) consists of 112 behaviour problem items, which are rated by the parent on a 3-point scale as to how well each describes the child. The Withdrawn/Depressed subscale was used, with higher scores reflecting greater parent reported depression severity. The CBCL is well researched and has adequate psychometric properties.

The Hopelessness Scale for Children (HSC) (Kazdin, Rodgers, & Colbus, 1986) consists of 17 true/false items that assess the respondents expectations of the future. Higher scores reflect a greater level of self reported hopelessness. It has moderate to high internal consistency (Cronbach's $\alpha = 0.75$) (Kazdin, et al., 1986)

The family and the friend components of the Perceived Social Support Questionnaire (Procidano & Heller, 1983) each consist of 20 items to assess the respondents perception of social support, including dimensions related to the extent to which the respondent perceived that their family and friends fulfil their needs for support, feedback and interaction. Higher scores reflect a higher perceived level of social support from friends and family. It has high internal consistency (Cronbach's $\alpha = 0.88$ to 0.90) and test-retest reliability over one month is 0.83 (Procidano & Heller, 1983).

The Family Assessment Device (Epstein, Baldwin, & Bishop, 1983) was developed from the McMaster Model of Family Functioning and designed to measure the structural and

organizational characteristics of a family. Six dimensions of family functioning are probed: problem-solving, communication, affective responsiveness, affective involvement, roles and behaviour control. Each dimension consists of a subscale with an additional general functioning subscale that measures overall health/dysfunction in the family unit. It consists of 60 items completed by a parent/guardian of the child or adolescent with the general functioning subscale (FAD-GF) used in the current analysis. Higher scores indicate better levels of general family functioning. It has moderate to high internal consistency (Cronbach's $\alpha = 0.72$ to 0.92) (Epstein, et al., 1983).

A questionnaire, the Suicidal Ideation Device (SID), was designed for this study in order to capture the extent and type of a range of **suicide-related behaviours (SRBs)**, including suicidal ideation and suicide attempt that may have occurred in the month preceding study entry. Using the SID, respondents indicated the presence or absence of 8 behavioural items with total scores ranging from 0 to 8; higher scores indicating more severe suicide-related behaviour.

The SID was based on the screening questions used in the Schedule for Affective Disorders and Schizophrenia for School Aged Children. These screening questions have been shown to fit a Guttman Scale, indicating that these behavioural items exist on a continuum of severity (Lewinsohn, Rohde, & Seeley, 1996). There are few measures that capture this continuum, despite research indicating that these behaviours, as well as suicide completion exist on a continuum, with each type of behaviour a marker of severity, increasing the risk of even more severe suicide-related behaviour (Andrews & Lewinsohn, 1992; Brent, et al., 1986; Lewinsohn, et al., 1996). Psychometric data collected from within the current study showed good correlation

between this questionnaire and a clinical suicidal ideation and attempt index formed from independent clinical interview by a Child and Adolescent Psychiatrist (Pearson Product Moment correlation coefficient, $r = .82$ $p < 0.0005$). Similarly, data collected within the study demonstrated construct validity by correlation between the Children's Depression Inventory total score and the Suicidal Ideation Device of 0.86; test-retest reliability of 0.90 over one week; inter-rater reliability 0.89 and high internal consistency (Cronbach's alpha was 0.96).

Procedure

Consecutive referrals to the clinic were invited to participate in the study, with over 98% agreeing to participate. Once written consent was obtained, a child and adolescent psychiatrist and a supervised trainee clinical psychologist undertook the assessment procedure. The A-DISC was administered to the participant who completed the above self-report measures. Concurrently, the participant's parent(s)/guardians separately completed the diagnostic assessment (A-DISC) and the FAD. At a separate session the participant was administered the WISC-III-R by a probationary psychologist, for the purpose of screening for exclusion from the study and measuring possible group differences in intelligence.

Data Analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS/PC), version 10.0. An independent samples t-test, with Type I error rate set at 0.05 was completed to examine the differences in factors known to influence suicide related behaviours, including age, gender (Lewinsohn, et al., 1996), IQ (Voracek, 2004) and parental psychopathology and social disadvantage and adversity (Beautrais, 2000) as well as in the dependant variables of interest

between a group with a depressive disorder as well as SRBs and a group with a depressive disorder and no SRBs. Preliminary checks identified no multivariate outliers or any violation of the assumptions of normality, linearity, multicollinearity or singularity, and homogeneity of variance-covariance matrices (Tabachnick & Fidell, 1996).

Hierarchical regression analysis was conducted to determine the proportion of variance that each of the psychosocial variables contribute to suicide risk above depression severity.

Consistent with Cohen's 1992 recommendation for interpreting effect sizes, any step which accounts for an additional 1 - 5.9% of the variance was interpreted as a small effect size, between 5.9 - 13.8% as a medium effect size, and over 13.8% as a large effect size.

Results

Of the original 59 participants who were eligible for the study, three were subsequently excluded from the analysis due to missing data leaving 56 participants. These 56 participants were divided into two groups based on whether or not they reported SRBs on the SID. In the group with a depressive disorder who also had SRBs (N=43), 24 had major depressive disorder, and 19 had dysthymic disorder. The mean score for depression severity in this group on the CDI was 20.8 (SD=8.6). In the group with a depressive disorder who did not have SRBs (N=13) 5 had major depressive disorder and 8 had dysthymic disorder. The mean score for depressive severity in this group on the CDI was 11.8 (SD=7.3), and below the clinical cut-off.

There were no statistically significant differences between the groups in age, IQ, parental psychopathology or social adversity scores between the groups (see Table 1). There was no

significant difference between groups on gender (see Table 1), however, it is notable that there were more males than females in the non SRB group compared to the SRB group (see Table 1).

-insert Table 1 here-

An independent samples t-test yielded a significant difference between the groups on the dependant variables of interest except for the variables measuring perceived social support. The group who reported SRBs reported significantly higher depressive disorder symptom severity (CDI), greater hopelessness and poorer family function (See Table 2).

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A hierarchial regression analysis was conducted to examine the unique relationships between SRBs (measured as a continuous variable) and the variables which were significantly different between the SRB and non-SRB groups, namely depression (both child and parent report; while parent report was not significantly different between groups, it approached significance), hopelessness, and family functioning. Due to the reported age and sex differences in the onset of SRBs (Lewinsohn, et al., 1996), this was controlled for by entering these variables on the first step. Both child and parent report of depression symptoms were entered on the first step due to their significant correlation ($r=.4$, $p<.01$). The entry of age, gender, self- and parent-reported depressive symptoms (CDI and CBCL-WD, respectively) on the first step of the analysis predicted 52.4% of the variance, $F(4, 51) = 16.1$, $p < .001$, constituting a large effect size. SRBs were predicted by older age and higher self-reported depressive disorder symptom severity (see Table 3). The entry of the main effect of hopelessness on the second step accounted for an

additional 9.7% of the variance in SRBs, constituting a medium effect size, $\Delta R^2 = .097$, F change (1, 50) = 14.1, $p = <.001$. The entry of family functioning on the third step accounted for an additional 4.3% of the variance in SRBs, constituting a small effect size, $\Delta R^2 = .043$, F change (1, 49) = 7.1, $p = .011$, with the final model accounting for 66.2% of the total variance. SRBs were predicted by older age, higher child-reported depressive disorder symptom severity, greater hopelessness and poorer family functioning.

-insert Table 3 here-

Discussion

The results demonstrate that the presence of SRBs in the context of a current depressive disorder episode (major depressive disorder or dysthymic disorder) in 10 to 16 year old children and adolescents is best predicted by the child report of depressive disorder symptom severity. Child report of depressive disorder symptom severity explained the greatest amount of variance in SRBs and is an important indicator of risk over and above the simple presence of a depressive disorder. This dimensional aspect of diagnosis is at least as important as simple categorisation based on the presence or absence of depressive disorder (Beardslee, et al., 1996; Greening & Stoppelbein, 2002; Klein, et al., 1996; Kovacs, Akiskal, Gatsonis, & Phoebe, 1994; Ryan, et al., 1987). Previous research has shown that SRBs represent an effort to relieve distress (de Wilde, Kienhorst, & Diekstra, 2001; Hawton, Cole, O'Grady, & Osborn, 1982) and a higher load of symptoms, therefore, provides a greater impetus toward these behaviours.

While not essential for diagnosis, Beck (1967) highlighted hopelessness as often present in those

with depression and it has been the focus of much research subsequently (Beck, 1967). In the present study, self reported levels of hopelessness were a significant predictor of SRBs once child and parent reports of depression were accounted for. While this finding is in contrast with several studies in similar age groups (Brent, et al., 1990; de Wilde, et al., 1993; 2002), it is consistent with much of the literature in adults. This supports previous findings that suicide attempts in adolescents are best predicted by longer-standing trait variables, including hopelessness, rather than less enduring variables that are state dependent (Goldston, Reboussin, & Daniel, 2006) . As a consequence, in children and adolescents, hopelessness is likely to act as a predisposing factor.

While it has been posited that hopelessness, specifically in relation to a sense of not belonging, increases the risk of SRBs (Joiner, 2002), this study showed that there were no differences between those with SRBs and those without in their perceptions of social support from friends and family. Perhaps, however, for children and adolescents a sense of belonging is secured via good family functioning, such that it is this aspect of a young person's psychosocial environment that modifies the risk of SRBs in the context of a depressive disorder. This is consistent with the present study's findings that family dysfunction was a significant predictor of SRBs once child and parent reports of depression were accounted for. It is interesting to note that while the parental report of child depression symptoms was not a significant predictor of SRBs there was an inverse relationship between this dependant variable and SRBs. In the context of poorer family functioning, children and adolescents may feel less able to communicate their emotions to their parents, or conversely parents may be unable to recognize their child's emotional world, further impacting on the child's sense of well-being

Perhaps, not surprisingly, the study demonstrated that children and adolescents with a depressive disorder and no SRBs were more likely to be younger. This is consistent with literature that shows higher rates of suicide related behaviours in females after the onset of puberty (Bridge, et al., 2006; Lewinsohn, et al., 1996).

Overall, the results generally support the stress-diathesis model with the depressive disorder acting as the stressor, and hopelessness in the context family discord acting as the diathesis. There are also important clinical implications from the study, in that the results of the study encourage clinicians to define depressive disorder symptom severity, particularly from the child's perspective. A dimensional measure of depressive disorder symptom severity, over and above a careful defining of the type of depressive disorder, is critical to understanding the risk of SRBs. Understanding the children and adolescents' context in terms of family functioning is critical. High family dysfunction is an important predictor of SRBs and it is suggested that parents of children and adolescents with depression and SRBs may be less aware of the emotional world and support needs of their child. These findings may help to provide direction for targeted interventions to address these clinical risk factors.

Strengths and limitations

This is a cross sectional study design, rather than longitudinal, therefore risk prediction over time was not possible. The study findings are in the context of a small number of participants, and it is notable that there are few females in the group who do not have suicidal behaviours. However, while it is a small study, it is of a relatively similar size to many studies in this field and it

incorporates detailed assessment of the child and adolescent as well as their parents/caregivers. SRBs are rated from the child and adolescent's perspective and are not objectively observed. One of the strengths of the study is that a number of psychosocial factors, guided by the stress diathesis model were tested, that also incorporated potentially protective factors. Nevertheless, the variables tested do not represent all of the significant correlates of adolescent suicide, and future studies should include a larger sample and more psychosocial factors to evaluate predictors in high-risk populations.

Conclusion

The results of this study are consistent with the stress-diathesis model of suicide (Mann, 2003), showing that children and adolescents with depressive disorders who have a high load of symptoms, in the context of hopelessness, and against a background of family dysfunction are at greater risk of suicidal behaviours. It is critical that clinicians incorporate a self-rated depression severity measure into their assessment of a child or adolescent who presents with a depressive disorder, as well as ensuring an understanding of the extent to which hopelessness characterises the child/adolescents cognitive style.

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