Published in final edited form as:

Arch Suicide Res. 2014 ; 18(1): 50–57. doi:10.1080/13811118.2013.803446.

Past Suicide Attempts in Depressed Inpatients: Clinical versus Research Assessment

Patricio Molero, M.D., Ph.D., Michael F. Grunebaum, M.D., Hanga C. Galfalvy, Ph.D., Mary A. Bongiovi, M.D., Ph.D., David Lowenthal, M.D., J.D., M. Goretti Almeida, M.B.A., C.P.H.Q., Ainsley K. Burke, Ph.D., Ellen Stevenson, B.A., M.D., J. John Mann, M.D., and Maria A. Oquendo, M.D.

Department of Psychiatry, Division of Molecular Imaging and Neuropathology, Columbia University and New York State Psychiatric Institute. 1051 Riverside Drive, New York, NY 10032, United States

Abstract

Objective—To compare structured clinical assessment versus research measurement of suicidal risk among inpatients with major depression.

Methods—50 depressed inpatients underwent a structured clinical and an independent research assessment of suicidal risk. Agreement between both assessments and its impact upon time to first readmission was tested.

Results—A false negative rate of 25% in the clinical screening of past suicide attempts was associated with older age, concealment and reported lower frequency of suicidal thoughts. Mean times to first readmission (2.5-years follow-up) were 74 weeks (discordant responders) and 118 weeks (concordant responders).

Conclusion—A failure to detect 25% of patients with past suicide attempt history in the clinical assessment was associated with older age and concealment of suicidal thoughts.

Keywords

Suicide, Attempted; Depression; Inpatients; Diagnostic Errors; Assessment, Risk; Bipolar Disorder

1. Introduction

Suicide is the tenth leading US cause of death among persons aged 10 year and older (CDC, 2010). Approximately 60% of suicides are associated with mood disorders (Mann, Apter, Bertolote et al. 2005) and a past suicide attempt is the strongest predictor of future attempt (Mann 2002). Since a history of suicidal behavior is an important risk factor for suicide in bipolar disorder (BD) (Hawton, Sutton, Haw et al. 2005) and major depressive disorder (MDD) (Oquendo, Currier and Mann 2006), awareness of past suicide attempts is key to prevention and therefore a vital part of clinical risk assessment.

Corresponding author: Patricio Molero, MD, PhD. pmolero@unav.es., Address: Department of Psychiatry, Clinica Universidad de Navarra. Avda Pio XII, 36. 31008 Pamplona, Spain.

Approximately 60% (Roy 1982) (Henriksson, Boethius and Isacson 2001) of suicides have seen a psychiatrist or other physician in the few weeks prior to death. Thus, improved clinical risk assessments may enhance prevention. This is especially important for hospital-based psychiatry, given that 80% of suicide victims are reported to have been hospitalized in their last healthcare contact and 44% commit suicide in the first month after discharge (Roy 1982). Suicidal ideas preceding or during admission are strongly associated with suicide among psychiatric hospital in-patients (Powell, Geddes, Deeks et al. 2000). A history of suicidal behavior predicts an increased risk of suicide at admission (in the short term), during hospitalization, and also in the long-term (McNiel&Binder 1997), (Neuner, Schmid, Wolfersdorf et al. 2008).

We compared a structured clinical suicide risk assessment performed routinely by inpatient staff at a tertiary care psychiatric hospital versus an independent, state-of-the-art research evaluation conducted in the same patients. The goal was to assess the accuracy of the clinical screen, with a particular focus on detection of past attempts and current ideation. This study replicates and extends, in an independent sample, our group's prior report (Malone, Szanto, Corbitt et al. 1995), which found a 24% failure rate of clinical assessment to detect past suicide attempts at admission in 50 inpatients with major depressive episode. Since the publication of that study, preventive strategies have been adopted to reduce the risk of suicide, though the effectiveness of some has been questioned (Crawford, Thomas, Khan et al. 2007), (Paris 2006). Indeed, according to our group's most recent report at this regard, the comparison of clinical and research assessments in a sample of 201 patients with major depression yielded a 18.7% failure rate of clinical assessment to detect suicide attempt history and a 29.7% failure rate to detect current suicidal ideation (Bongiovi-Garcia, Merville, Almeida et al. 2009). The current study was motivated by the ongoing goal of quality improvement in procedures for inpatient suicidal risk screening.

Aims of the study

Using a similar method, we aimed to examine whether clinical detection of past suicide attempts has improved in the 5 years since the prior report, and to study the association of failure to detect past suicide attempts on risk of readmission.

2. Method

2.1. Subjects

The sample comprised N=50 subjects consecutively admitted between July 2006 and January 2009 to a research inpatient unit of New York State Psychiatric Institute/Columbia University Medical Center for participation in studies of suicidal behavior and mood disorders. Eligibility criteria were age 18 to 80 years, a DSM-IV-TR (First, Spitzer, Gibbon et al. November 2002) major depressive episode, unipolar or bipolar, with score of 16 or greater on the 17-item Hamilton Depression Rating Scale (Hamilton 1960), and without acute medical illness. After complete explanation of the studies, written informed consent as approved by the Institutional Review Board was obtained from all subjects.

Inpatient clinical staff (Postgraduate year II resident physicians (PGYIIs) with attending physician supervision) administered a structured suicide risk assessment to all subjects. Simultaneously, independent research staff (Masters or PhD level clinicians) assessed the same subjects using a comprehensive assessment of suicidal ideation, behavior, and history, within 1–5 days of the clinical assessment.

2.2. Suicide assessments

Clinical suicide risk screen—The clinical suicide assessment (summarized in Table 1) included three gateway questions. If the answer to any of these was affirmative, patients were asked a series of yes/no questions: 10 focused on the current presentation and 5 explored past history and risk factors.

Research assessment of suicidal history and risk—The research assessment included: the Columbia Suicide History Form (Oquendo, Halberstam and Mann 2003), Beck Scale of Suicidal Ideation (SSI) (Beck, Kovacs and Weissman 1979), Hamilton Depression Rating Scale (Hamilton 1960), Suicide Intent Scale (Beck, Weissman, Lester et al. 1976), Brown-Goodwin Aggression Inventory (BGAI), (Brown, Goodwin, Ballenger et al. 1979), Beck Depression Inventory (Beck, Ward, Mendelson et al. 1961), Barratt Impulsivity Scale (BIS II), (Barratt 1965), and Beck Hopelessness Scale (BHS) (Beck, Weissman, Lester et al. 1974).

2.3. Statistical analysis

Statistical tests used SPSS (version 15.0.1). Univariate analyses included Chi-square, Fisher's Exact Tests, Student t, and non-parametric tests, as appropriate. We used Kaplan-Meier survival analysis to compare time to first inpatient readmission during up to 2.5-years follow-up between patients who answered questions about past suicide attempt status consistently on the clinical and research assessments (concordant responders) versus those who gave different answers on the clinical and research screens (discordant responders). For descriptive purposes, the parametric variables were expressed as mean (SD) whereas the non-parametric variables were expressed as median (interquartile range) (IQR).

3. Results

3.1 Association between clinical and research assessments

The mean age of the sample was 42 (SD=1.6; Range=18 to 67), 70% were females, 29 had major depressive disorder, and 21 had a bipolar diagnosis. 35 answered affirmatively to at least one clinical screen gateway question and so received the complete structured clinical assessment.

There was a strong positive association between the clinical screen for suicidal thoughts and the total scores of the SSI, both for current and for 2 weeks prior to admission. A positive answer to the clinical screen question *“Does the patient have thoughts about suicide or about hurting him/herself?”* was associated with higher scores in both current (median (IQR): “Yes”: 19.5(19), “No”: 4(11); Mann-Whitney test $U=18.5$, $p=0.010$) and prior (median (IQR): “Yes”: 15.5(22), “No”: 0(11); Mann-Whitney test $U=27.5$, $p=0.023$) SSI

scores. Likewise, a positive answer to the clinical question “*Has the patient experienced either suicidal thoughts or a suicide attempt in the past 6 months?*” was associated with higher scores in both current (median (IQR): “Yes”: 16(15), “No”: 0(0); Mann-Whitney test $U=1.5$, $p=0.024$) and prior (median (IQR): “Yes”: 14.5(25), “No”: 0(0); Mann-Whitney test $U=5$, $p=0.039$) total scores of the SSI.

An affirmative answer to the clinical screen question “*Was there a plan expressed by the patient or did the patient engage in any behaviors in furtherance of a plan?*” was associated with higher scores in the items of SSI measuring the planning of suicide attempts (items 12–19) (median (IQR): “Yes”: 13.5(10), “No”: 8(6); Mann-Whitney test $U=7.5$, $p=0.031$). Positive answer on the clinical screen, for current suicidal thoughts was associated with higher hopelessness scores on the BHS (median (IQR): “Yes”: 16(10), “No”: 7.5(10); Mann-Whitney test $U=44$, $p=0.039$).

Response to the clinical screen question “*Has the patient made a recent suicide attempt?*” was associated with the research question “*Did you ever attempt suicide?*” ($\chi^2=11.11$, $df=1$, $p=0.001$), from the Columbia Suicide Form (History of suicidal ideation) (Oquendo, Halberstam and Mann 2003). Subjects who reported “*acute stressors related to current suicidal ideation?*” in the clinical assessment tended to also endorse triggers in the research assessment: all subjects who endorsed triggers in the research assessment ($n=16$), also reported acute stressors in the clinical screen). However, 5 patients who denied triggers in the clinical screen, did endorse health-related stressors in the research assessment.

3.2. Detection of past suicide attempts

On the clinical screen, 18/50 subjects reported a past suicide attempt. In contrast, 24/50 subjects reported one on the research assessment. Thus, 6 of the latter 24 denied a suicide attempt on the clinical screen while reporting one on the research assessment. Assuming the research assessment as reference, this equals a false negative rate of 25% on the clinical screen (6/24) ($\chi^2=14.85$, $df=1$, $p<0.001$, 95% CI 9.8 – 46.7%). No patients reported a past suicide attempt on the clinical screen while denying it on the research assessment.

Compared to subjects who concordantly answered “Yes” to the clinical and research questions on past suicide attempt ($N=18$), those who answered discordantly ($N=6$) were older (mean (SD) difference of 10.8 (SD=4.8) years; $t=2.248$, $p=0.035$); less likely to openly reveal suicidal thoughts (SSI “*deception/concealment*” item 19) ($\chi^2=5.605$, $df=1$, $p=0.036$); and reported less frequent suicidal thoughts (Suicide History answers “Rarely” or “Sometimes”: $\chi^2=6.142$, $df=1$, $p=0.023$) (Table 2). The impact of mood disorder type (unipolar vs bipolar) on the false negative rate was tested yielding non significant differences.

8/50 patients were readmitted to the inpatient unit during follow-up of up to 2.5 years (mean time to readmission: 113 (Std. Error=7.1) weeks). Discordant responders to the clinical and research questions on past suicide attempt status had a shorter time to inpatient readmission ($N=6$, mean time to readmission 74.2 (Std. Error=18.9) weeks) than concordant responders did ($N=27$, mean time to readmission 118.6 (Std. Error=8.2) weeks) but this did not reach statistical significance (Log Rank (Mantel-Cox) $\chi^2=2.201$, $df=1$, $p=0.138$) (Figure 1).

Discussion

Comparison of a structured clinical suicide risk screen performed by inpatient staff versus an independent research assessment had two main findings. First, in spite of the fact that the clinical screen questions on current suicidal ideation, plans, and recent attempts all correlated with higher scores on the SSI for ideation severity and planning, and also with higher hopelessness on the BHS, the clinical screen failed to provide reliable information regarding detection of past suicide attempts, yielding a false negative rate of 25%. This assumes the more comprehensive research assessment with validated instruments as reference. It is possible that some patients underreported suicidal behavior in the research assessment and thus the actual false negative rate could be higher.

The second main finding is a finer-grained characterization of subjects who gave discordant answers to the clinical versus research questions about history of past suicide attempt. Variables that predicted a false negative response to the clinical screen were: 1) a less forthcoming attitude to reveal suicidal ideas (SSI item #19: *Deception/Concealment of contemplated suicide*); and 2) an older age. Older patients may be less likely to disclose a past suicide attempt due to greater sense of stigma in older generations. The issue of concealment is thorny. Clinicians can only assess suicide history and therefore risk by relying on patient or family report. That patients would conceal this critical data suggests that conversations with families might be of utility, if burdensome. On the other hand, because more patients were able to divulge their suicide history to research psychologists, this suggests the possibility that more training on eliciting this type of information may increase identification of pertinent risk factors. Thus, training of mental health professionals on eliciting information regarding suicide ideation and past suicide attempts is crucial for suicide risk assessment. The finding that about 40% of patients who reported suicidal ideation in a cohort study denied ever having suicidal thoughts during their lives in a re-examination four years later underscores the need for clinicians to be vigilant to the fact that suicidal ideation and behavior tend to be underreported by patients (Goldney, Smith, Winefield et al. 1991).

The existence of triggers of suicide ideation or attempts appeared to be reliably identified in the clinical assessment, with the exception of triggers related to health problems, which appeared to be under-reported on the clinical screen. This exception could be described as paradoxical, given that the clinical assessment occurred in a hospital setting. Given the high reported rate of suicidal behavior following discharge from inpatient psychiatric care (Roy 1982), hospital staff may consider pro-actively addressing medical problems as possible triggers in affected patients.

The 25% false negative rate in detection of past suicide attempts by the clinical screen is comparable to that found in our report 15 years ago using a similar approach in an independent sample (Malone, Szanto, Corbitt et al. 1995). In the present study the clinical assessment was implemented with a semistructured screening instrument (Table 1) that did not translate into a reduction of the false negative rate. In addition to replicating our prior findings, we have extended them by demonstrating that discordant responses on the past

suicide attempt questions were associated with being older, reluctance to share suicidal thoughts, and reporting less frequent suicidal ideation.

Limitations and strengths

The main limitation of this study is the small sample size. Lack of statistical power may explain the non-significant finding of shorter time to inpatient readmission among suicide attempt discordant responders. There is also a risk of false positive statistical associations due to multiple tests. Another limitation is the possibility that some patients may have forgotten suicide attempts that took place in the distant past (predating admission by more than 6 months), though this hypothesis seems unlikely given the salience of these events to most patients. Also, possible explanations of the lower effectiveness of the clinical screen to capture suicide risk factors could be a not optimal clinical assessment focused in a too narrow span of time (the past 6 months), or underreporting of suicidal behavior to clinicians but not to researchers, possibly due to fear of being required to receive more intensive supervision from nursing while on the inpatient unit (Bongiovi-Garcia, Merville, Almeida et al. 2009). It is possible that in some cases, neither the clinical nor the research assessment detected a history of suicide attempt and thus the false negative rate for the clinical assessment may be higher than we report. The structured suicide assessment conducted by the PGYII was part of the routine clinical assessment on admission of a specific training program and may not be representative of other clinical assessments routinely conducted in similar settings. Lastly, a change in the clinical status of patients over the 1–5 days between both assessments could explain some of the discrepancies (Bongiovi-Garcia, Merville, Almeida et al. 2009), although possibly less likely to explain the difference in reporting of a remote suicide attempt. The interval between both assessments was not considered as a cofactor in the results due the very small sample sizes that would have been tested on different days. In spite of these limitations, this methodology allowed a nearly contemporaneous independent evaluation of suicide risk by means of different tools and approaches, leading to possible recommendations towards a quality improvement on inpatient suicide risk screening.

Conclusions

The results, based solely in a sample of unipolar and bipolar mood disordered patients during a depressive episode, require replication in larger and more diverse samples. If confirmed, the findings would suggest that older patients and those who appear more prone to conceal suicide-related history merit extra effort by clinicians to develop trust. Efforts by inpatient clinical staff to reduce stigma and facilitate the sharing of suicidal thoughts, feelings, and history, may enhance detection of past attempts. This may aid prevention of future suicidal behavior. Also, these results underscore the need for clinicians to be vigilant to the fact that suicidal ideation and behavior tend to be underreported by patients, the need for specific training on suicide risk evaluation for clinical staff, and also for implementing routine clinical suicide risk assessment with thoughtfully designed screening instruments. It is possible that a multi-method approach of suicide assessment integrating the use of structured and semi-structured assessments might improve the accuracy of suicide risk assessments of inpatients with major depression and especially of older patients.

Acknowledgments

Funding

This study was supported by NIMH grants MH48514, P50 MH62185, MH76049 and MH048514.

References

- Barratt ES. Factor Analysis of Some Psychometric Measures of Impulsiveness and Anxiety. *Psychological Reports*. 1965; 16:547–554. [PubMed: 14285869]
- Beck AT, Kovacs M, Weissman A. Assessment of suicidal intention: the Scale for Suicide Ideation. *Journal of Consulting and Clinical Psychology*. 1979; 47(2):343–352. [PubMed: 469082]
- Beck AT, Ward CH, Mendelson M, et al. An inventory for measuring depression. *Archives of General Psychiatry*. 1961; 4:561–571. [PubMed: 13688369]
- Beck AT, Weissman A, Lester D, et al. The measurement of pessimism: the hopelessness scale. *Journal of Consulting and Clinical Psychology*. 1974; 42(6):861–865. [PubMed: 4436473]
- Beck AT, Weissman A, Lester D, et al. Classification of Suicidal Behaviors: II. Dimensions of Suicidal Intent. *Archives of General Psychiatry*. 1976; 33(7):835–837. [PubMed: 942287]
- Bongiovi-Garcia ME, Merville J, Almeida MG, et al. Comparison of clinical and research assessments of diagnosis, suicide attempt history and suicidal ideation in major depression. *Journal of Affective Disorders*. 2009; 115(1–2):183–188. [PubMed: 18814917]
- Brown GL, Goodwin FK, Ballenger JC, et al. Aggression in humans correlates with cerebrospinal fluid amine metabolites. *Psychiatry Research*. 1979; 1(2):131–139. [PubMed: 95232]
- CDC. Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. 2010. Available from URL: www.cdc.gov/injury/wisqars/index.html
- Crawford MJ, Thomas O, Khan N, et al. Psychosocial interventions following self-harm: systematic review of their efficacy in preventing suicide. *British Journal of Psychiatry*. 2007; 190:11–17. [PubMed: 17197651]
- First, MB.; Spitzer, RL.; Gibbon, M., et al. Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition. (SCID-I/P). New York: Biometrics Research, New York State Psychiatric Institute; 2002 Nov.
- Goldney RD, Smith S, Winefield AH, et al. Suicidal ideation: its enduring nature and associated morbidity. *Acta Psychiatrica Scandinavica*. 1991; 83(2):115–120. [PubMed: 2017908]
- Hamilton M. A rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry*. 1960; 23:56–62.
- Hawton K, Sutton L, Haw C, et al. Suicide and attempted suicide in bipolar disorder: a systematic review of risk factors. *Journal of Clinical Psychiatry*. 2005; 66(6):693–704. [PubMed: 15960561]
- Henriksson S, Boethius G, Isacson G. Suicides are seldom prescribed antidepressants: findings from a prospective prescription database in Jamtland county, Sweden, 1985–95. *Acta Psychiatrica Scandinavica*. 2001; 103(4):301–306. [PubMed: 11328245]
- Malone KM, Szanto K, Corbitt EM, et al. Clinical assessment versus research methods in the assessment of suicidal behavior. *American Journal of Psychiatry*. 1995; 152(11):1601–1607. [PubMed: 7485622]
- Mann JJ. A current perspective of suicide and attempted suicide. *Annals of Internal Medicine*. 2002; 136(4):302–311. [PubMed: 11848728]
- Mann JJ, Apter A, Bertolote J, et al. Suicide prevention strategies: a systematic review. *JAMA*. 2005; 294(16):2064–2074. [PubMed: 16249421]
- McNiel DE, Binder RL. The impact of hospitalization on clinical assessments of suicide risk. *Psychiatric Services*. 1997; 48(2):204–208. [PubMed: 9021851]
- Neuner T, Schmid R, Wolfersdorf M, et al. Predicting inpatient suicides and suicide attempts by using clinical routine data? *General Hospital Psychiatry*. 2008; 30(4):324–330. [PubMed: 18585535]
- Oquendo MA, Currier D, Mann JJ. Prospective studies of suicidal behavior in major depressive and bipolar disorders: what is the evidence for predictive risk factors? *Acta Psychiatrica Scandinavica*. 2006; 114(3):151–158. [PubMed: 16889585]

- Oquendo MA, Halberstam B, Mann JJ. Risk Factors for Suicidal Behavior: The Utility and Limitations of Research Instruments. *Standardized Evaluation in Clinical Practice* M. B. First, American Psychiatric Publishing. 2003:103–130.
- Paris J. Predicting and preventing suicide: do we know enough to do either? *Harvard Review of Psychiatry*. 2006; 14(5):233–240. [PubMed: 16990168]
- Powell J, Geddes J, Deeks J, et al. Suicide in psychiatric hospital in-patients. Risk factors and their predictive power. *British Journal of Psychiatry*. 2000; 176:266–272. [PubMed: 10755075]
- Roy A. Risk factors for suicide in psychiatric patients. *Archives of General Psychiatry*. 1982; 39(9): 1089–1095. [PubMed: 7115014]

Figure 1.

Survival analysis of the time to readmission of discordant responders (“Yes” attempt research/“No” attempt clinical: N = 6; mean time to readmission 74.2 weeks) and concordant responders (“Yes” attempt both screens: N = 18; “No” attempt both screens: N = 9; total N = 27; mean time to readmission 118.6 weeks) (Log Rank (Mantel-Cox) $\chi^2 = 2.201$, df = 1, p = 0.138).

Table 1

Design and content of the clinical and research suicide assessments

Clinical Assessment	Research Assessment
<p><u>Gateway questions</u></p> <ol style="list-style-type: none"> 1 Does the patient have thoughts about suicide or about hurting him/herself? 2 Has the patient made a recent suicide attempt? 3 Has the patient experienced either of the above in the past 6 months? <p><u>Current presentation</u></p> <ol style="list-style-type: none"> 1 Is the patient currently expressing suicidal ideation? 2 Did the patient experience significant suicidal ideation in the weeks leading to admission? 3 Was there a plan expressed by the patient or did the patient engage in any behaviors in furtherance of a plan? 4 Did the patient engage in suicidal behavior prior to admission? 5 Was the patient abusing drugs or alcohol prior to admission? 6 Were the following symptoms present at the time of any suicidal behavior/ideation referred to above: Hopelessness? 7 Were the following symptoms present at the time of any suicidal behavior/ideation referred to above: Impulsivity/Aggression? 8 Were the following symptoms present at the time of any suicidal behavior/ideation referred to above: Shame/humiliation? 9 Was the patient in treatment prior to admission? 10 Were there any acute stressors related to current suicidal ideation? <p><u>Past history and risks of suicide</u></p> <ol style="list-style-type: none"> 1 Is there a past history of suicidal ideation? 2 Is there a past history of suicide attempts? 3 Is there a past history of substance abuse? 4 Was the patient in treatment at the time of past suicidal ideation/behaviors? 5 Is there a family history of completed suicide? 	<p>Columbia Suicide Form (History of suicidal ideation)</p> <p>Beck Scale for Suicidal Ideation</p> <p>Hamilton Depression Rating Scale</p> <p>Suicide Intent Scale</p> <p>Brown-Goodwin Aggression Scale</p> <p>Beck Depression Inventory</p> <p>Barratt Impulsivity Scale</p> <p>Beck Hopelessness Scale</p>

Table 2
Comparison of patients according to responses on clinical versus research screen for past suicide attempt

	"Yes" Attempt Clinical and Research Screens (N=18)	"Yes" Attempt Research / "No" Attempt Clinical Screen (N=6)	t/ χ^2	p
Age -m(sd)-	38.22(10.52)	49(8.85)	2.248	0.035
Gender (male/female)	6(33.3)/12(66.7)	1(16.7)/5(83.3)	0.605, df=1	0.629
SSI19 (current): "Revealed ideas openly," N(%)	9/11(90.0)	1/5(10.0)	5.605, df=1	0.036 ^a
Reported frequency of suicidal thoughts N(%)	Rarely/Sometimes	5/6(83.3)	6.142, df=1	0.023 ^a
	Often/Almost Always	1/6(16.7)		

^a 2-tailed Fisher's Exact Test