American Journal of Emergency Medicine 33 (2015) 1680–1683

Contents lists available at ScienceDirect

American Journal of Emergency Medicine

journal homepage: www.elsevier.com/locate/ajem

Brief Report

Suicide screening tools and their association with near-term adverse events in the ED☆,☆☆

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ARTICLE INFO

Article history:
Received 14 July 2015
Received in revised form 3 August 2015
Accepted 5 August 2015

ABSTRACT

Objectives: The goal of this study was to evaluate the relationship between various suicide screening tools and clinical impression with subsequent patient psychiatric admission and near-term adverse emergency department (ED) events.

Methods: We performed a prospective observational study of 50 patients with suicidal ideation in the ED. Subjects completed a series of depression/suicide screening tools: the Columbia Suicide Severity Scale, SAD PERSONS scale, Patient Health Questionnaire 9, and Beck Scale for Suicidal Ideation. Clinicians were also asked about their impression on likelihood of patient admission. Outcome measures were as follows: need for psychiatric hospital admission, prolonged stay at psychiatric facility, and any adverse events during ED stay including need for unscheduled psychiatric or sedating medications, need for physical restraints, and need for intervention by security staff.

Results: The Beck Scale for Suicidal Ideation, Patient Health Questionnaire 9, and Columbia Suicide Severity Scale did not significantly predict within-ED adverse events or admissions to psychiatric facilities. Wald test for individual parameters at an α of .10 level found that patients who were screened positive by their nurse had 3.37 times the odds of adverse within-ED events; patients with a positive SAD PERSONS score had 8.18 times the odds of psychiatric admission greater than 5 days. However, at the α of .05 level, no screening tools correlated with patient ED course or likelihood of psychiatric admission.

Conclusion: Clinical impression alone and the suicide screening tools showed poor predictive value for near-term events. Data from this study highlight the need for the development of ED-based suicide screening instruments capable of identifying those patients with suicidal ideation at greatest risk.

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1. Introduction

1.1. Background

Suicide is the 16th leading cause of death worldwide and accounted for 38 364 deaths in the United States in 2010 [1]. Self-injurious thoughts and behavior (SITB) such as suicidal ideation (SI) are also common, with lifetime prevalence among US adults of 15.6%, 5.4%, and 5.0% [2]. Self-injurious thoughts and behavior is a common condition evaluated in the emergency department (ED), with nearly 420 000 annual ED visits for SITB [3]. Given the frequency of SITB seen in the ED and the severity of untreated disease, it is critical to be able to identify SITB patients at greatest risk for an acute event.

1.2. Importance

Multiple instruments for suicide screening exist ranging from structured interviews [4], self-report surveys [5], to clinician assessments [6]. Although some of these instruments have predicted subsequent risk for death by suicide, past work has focused on long-term suicide risk on the order of years to decades, timeframes impractical for the emergency physician [7]. Few studies have evaluated the utility of these instruments in assessing near-term suicide risk for patients in the ED.

1.3. Goals of this investigation:

The goal of this pilot study was to explore the relationship of several commonly used suicide screening instruments, along with clinician “intuition” (ie, providers' perception of the patient's likelihood of having an acute psychiatric emergency requiring admission) with their association to subsequent patient clinical course in ED patients endorsing SITB.

☆ Grant: None/unfunded.
☆☆ Meetings: Previously presented at the Society for Academic Emergency Medicine Annual Conference San Diego, May 12 to May 15.
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http://dx.doi.org/10.1016/j.ajem.2015.08.013
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2. Methods

2.1. Study design and setting

We performed a prospective correlation study of 50 patients with a chief complaint of SITB and their 150 ED providers (nurse, resident physician, and attending physician) to evaluate the association of suicide instrument scores and subjective clinical impression with near-term clinical course. The study setting was a single urban, university-affiliated teaching hospital ED staffed by board-certified emergency medicine physicians and 24-hour Comprehensive Psychiatric Emergency Program. As this represents a pilot study of suicide screening instruments not previously studied in the ED, we chose a convenience sample of 50 patients from which test characteristics such as sensitivity and specificity could be inferred, allowing for future studies of adequate power and size. The study protocol was approved by the X Medical Center Institutional Review Board.

2.2. Selection of participants

We identified 50 patients aged 18 years or older presenting to the ED with a chief complaint of "suicidal ideation," "thinking of hurting myself," "I want to die," or "SI." Patients with concomitant alcohol or drug intoxication, acute medical illness, or being evaluated with actual suicide attempt were excluded. In addition to interviewing each of the 50 patients, we also interviewed the nurse, resident physician, and supervising attending physician assigned to care for the patient.

2.3. Outcome measures

Although completed suicide would be an ideal outcome measure, given the extremely low base rate of completed suicide and coupled with a small sample size for a pilot study, we sought other variables indicative of a complicated near-term clinical course. We identified 3 such outcome measures: need for psychiatric hospital admission; prolonged stay at a psychiatric facility (>5 days); and adverse events during the ED stay including need for unscheduled psychiatric or sedating medications, physical restraints, or security staff intervention.

2.4. Data collection and analysis

After obtaining informed consent from the patient and the 3 associated clinicians, patients were administered 4 suicide screening tools: the Patient Health Questionnaire 9 (PHQ-9) [8], the Beck Scale of Suicidal Ideation [9], the Columbia Suicide Severity Rating Scale (C-SSRS) self-report screener [6], and the SAD PERSONS scale [10]. Clinical providers were given a questionnaire asking years of experience and clinical impression, using a 1 to 10 scale, of the likelihood that the patient's presentation represented a high-risk psychiatric emergency requiring hospitalization. Two weeks after ED evaluation, research assistants reviewed medical records using a standardized protocol for subsequent ED and hospital course. Research assistants first noted the ultimate disposition of the patient followed by a review of any indication of a complicated course based on the aforementioned outcome measures by reviewing the medical record, including the nursing/physician notes, medications administered, and report of any events during the hospital course.

The goal of our study was to evaluate if any of the suicide screening instruments had a stronger association with near-term adverse outcomes and to quantify any relationship between clinician intuition and subsequent patient course. We were also interested if years of experience and cadre of provider altered the relationship between clinician intuition and near-term outcomes. To address these questions, we calculated receiver operating characteristic (ROC) curves of the suicide instruments and ED provider clinical impression relative to the near-term outcome measures. Receiver operating characteristic curve analysis was used to choose screening instruments and ED provider groups for further study and to determine cutoff values for the screening instruments and ED provider clinical impression ratings. We then performed logistic regressions and used the Wald test for individual parameters to calculate odds ratios for screening instruments and clinical impression ratings in predicting adverse near-term outcomes. Odds ratios for ED provider clinical impressions were adjusted for provider's years of experience.

3. Results

Characteristics of the 50 patients in the study sample are described in Table 1. Twenty-two patients (44%) were admitted to a psychiatric inpatient unit, 13 of whom (26%) had admissions of greater than 5 days. A composite outcome measure of adverse within-ED events was calculated for each patient using the aforementioned criteria; 19 patients (38%) had at least 1 within-ED adverse event. Of the 28 patients who were discharged from the ED after psychiatric evaluation, 4 re-presented to the ED within 2 weeks for a chief complaint of SI/depression (3 of the patients) or intoxication (1 patient). Of these 4 patients who re-presented to the ED within the 2-week period, 1 was admitted to a psychiatric facility, and 3 were discharged directly from the ED after psychiatric evaluation.

Receiver operating characteristic curves were constructed for each suicide risk instrument and for the clinical impression score given by nurses, attending physicians, and resident physicians, using each of the 3 outcome measures. Areas under the ROC curves (AUCs) are reported in Table 2. The Beck Scale of Suicidal Ideation, PHQ-9, and C-SSRS instruments performed poorly at predicting within-ED adverse events, admissions to psychiatric facilities, and prolonged psychiatric admissions, with AUCs less than or not significantly greater than 0.5. The SAD PERSONS scale was better at predicting near-term outcomes, with an AUC of 0.72 (95% confidence interval [CI], 0.67-0.87; $P = .009$) for predicting psychiatric facility admission and 0.76 (95% CI, 0.61-0.91; $P = .006$) for predicting prolonged psychiatric hospitalization; both of these associations were significantly different from the null hypothesis AUC of 0.5 at the α of .05 level of significance. The SAD PERSONS scale, however, was not predictive of within-ED adverse events.

Nurse and attending physician clinical impressions all had AUCs greater than 0.5, but attending physician clinical impressions were not statistically significant in predicting any outcomes. Nurse clinical impression was significantly predictive of prolonged hospitalization (AUC, 0.71; 95% CI, 0.51-0.92; $P = .023$) but not predictive of within-ED adverse events (AUC, 0.65; 95% CI, 0.49-0.81; $P = .084$) or psychiatric admission (AUC, 0.59; 95% CI, 0.41-0.77; $P = .28$). Resident physician

Table 1
Study sample characteristics and suicide screening measures

Sample characteristics	n (%)
Age in years (mean, range)	36.4 (20-57)
Female	28 (44%)
History of prior suicide attempt	24 (48%)
Existing psychiatric comorbidity	47 (96%)
Suicide screening measures	
Beck[a] suicide intent scale (mean, range, SD)	28.60 (12-36, 5.47)
PHQ-9[b] score (mean, range, SD)	22.74 (10-27, 3.24)
SAD PERSONS[c] scale (mean, range, SD)	7.24 (4-10, 1.61)
ED provider clinical impression score[d]	
Nurse (mean, range, SD)	5.34 (1-10, 2.83)
Attending physician (mean, range, SD)	5.86 (1-10, 2.46)
Resident physician (mean, range, SD)	7.16 (1-10, 2.34)

[a] Scaled from 0 to 38, higher scores indicating higher suicide intent.
[b] Scaled from 1 to 27, higher scores indicating higher suicide risk.
[c] Scaled from 0 to 10, higher scores indicating higher suicide risk.
[d] Scaled from 1 to 10, higher scores indicating more likely need for admission to psychiatric facility.

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