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Early death after emergency department discharge in patients with psychiatric illness

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To the Editor

Patients with psychiatric disease make up a significant portion of patients cared for in emergency departments (EDs). [1] While some patients present with clear behavioral health manifestations (*e.g.*, suicidality), other patients present with problems not overtly behavioral (*e.g.*, chest pain). Past work has documented how concurrent psychiatric illness can complicate evaluation of somatic complaints. [2–5] A key question for providers caring for patients in the ED concerns safe disposition. Adverse events, such as unanticipated death after discharge, are a cause of great concern. While prior efforts have investigated death after discharge from ED hospitalizations, [6–10] few studies have investigated post-discharge death of patients with a comorbid history of psychiatric disease. The goal of our study was to describe the frequency and causes of death after ED discharge in patients with a history of psychiatric illness. Understanding the potential relationship between psychiatric disease and death after ED discharge would help clinicians to better identify these potentially high risk ED discharges.

We conducted a retrospective case-control study of two academic urban medical centers between 2005–2011. We identified patients with psychiatric illnesses who died within 15 days of discharge, as determined by linked ED records to the Social Security Administration's Death Master File. Patients were matched by age and sex to patients with

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psychiatric illness who did not die within 15 days. Our main outcome measures were factors associated with 15-day mortality after ED discharge. Medical records, including documentation from ED visits underwent chart review blinded to outcome by two trained abstractors (mean Cohen's $\kappa = 0.82$, 95% CI 0.79 to 0.85). Reviewers extracted demographics, past medical history, and details of ED visits (*e.g.*, vital signs, ED interventions). We excluded patients who had: (1) prior hospice or palliative care encounters, (2) Do Not Resuscitate/Do Not Intubate (DNR/DNI) orders, (3) a history of metastatic malignancies or chemo/radiation therapy in the 30 days before their ED visit. Deaths (cases) were matched to patients who did not die in the 15 days after discharge (controls) based on age (± 5 years), sex, hospital, and date of visit (± 45 days).

Of the 426,597 discharged patients with prior psychiatric diagnoses seen from 2005–2011, 0.15% ($n=613$) died within 15 days of ED discharge. This was significantly higher than the rate of 15-day death post ED discharge in the 493,626 patients without a psychiatric diagnosis (0.083%, $p < 0.001$). Table 1 shows causes of death for cases, drawn from death certificates. Overall, 16.3% of patients died of causes clearly related to mental health, mostly substance abuse (11.9%) and events of undetermined intent (*i.e.*, possible suicide, 3.3%). The majority had medical causes of death (83.7%), most commonly ischemic heart disease (20.7%) and lower respiratory disease (7.6%).

Table 2 compares past medical history and health care utilization between cases and controls. Patients who died had a higher comorbidity burden than controls (median, 2 vs 1; interquartile range [IQR], 0–4 vs 0–2; $p < 0.001$), driven by renal failure (29.3% of cases) and CHF (38.0%). Regarding reasons for ED visits, while both cases and controls were selected based on prior psychiatric history, psychiatric chief complaints were rare in both groups. Substance abuse-related chief complaints accounted for 4.3% of cases and 5.4% of controls. The most common chief complaints in cases were visit/test follow-up (14.1%), fall (12.0%), and dyspnea (9.8%), while in controls, chest pain (13.0%), extremity pain (12.0%), and abdominal pain (9.8%) were most common.

Our study suggests that patients with prior psychiatric history had a significantly higher rate of early death after ED discharge compared to ED patients without. For patients with pre-existing psychiatric disease, we also described several characteristics linked to higher risk of death after discharge. Our finding that individuals with psychiatric disease had increased near-term mortality risk compared to patients without psychiatric disease suggest that patients with a history of mental illness may be an especially vulnerable population of individuals evaluated in the ED. The ability to identify those patients within this cohort at increased risk for such negative outcomes would help providers determine timely and safe dispositions for these patients cared for in the ED.

Our study had several limitations. It was conducted in a large quaternary academic medical center with 24-hour multi-sub-specialty services and ED observation capabilities, which may make findings less generalizable. Additionally, our study was a subgroup analysis of a larger study and remained observational.

In summary, our study found that patients with existing psychiatric disease had higher rates of death after ED discharge for a range of behavioral health and non-behavioral complaints. We also described the characteristics of these patients with psychiatric disease who died soon after ED discharge. We hope the findings of our study will stimulate future work on the development of risk screening strategies aimed at identifying and improving outcomes for such patients cared for in the ED.

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Table 1

Top 20 Causes of Death for Patients with Psychiatric Medical Histories who Died within 15 Days Post Emergency Department Visit.

Cause of death		Cases, %
1.	Ischemic heart diseases	20.7
2.	Substance abuse-related diseases	11.9
3.	Chronic lower respiratory diseases	7.6
4.	Other forms of heart disease	4.3
5.	Hypertensive diseases	4.3
6.	Event of undetermined intent	3.3
7.	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	3.3
8.	Diseases of arteries, arterioles and capillaries	3.3
9.	Organic, including symptomatic, mental disorders	3.3
10.	Accidental poisoning by and exposure to noxious substances	2.2
11.	Other bacterial diseases	2.2
12.	Viral hepatitis	2.2
13.	Event of undetermined intent	2.2
14.	Accidental exposure to other and unspecified factors	2.2
15.	Malignant neoplasms of digestive organs	2.2
16.	Noninfective enteritis and colitis	2.2
17.	Intentional self-harm	1.1
18.	Other degenerative diseases of the nervous system	1.1
19.	Other disorders of the nervous system	1.1
20.	Other causes	18.7

¹ Substance abuse-related diseases include acute overdose (5.4%) and long-term sequelae of substance abuse (6.5%).

Table 2

Patient Characteristics at Time of Emergency Department Visit.

Variable	Case status		Univariate	
	Case (n=92)	Control (n=92)	OR	p-value
<u>Demographics</u>				
Age, mean (95% CI)	65.9 (62.3 to 69.5)	65.3 (61.6 to 68.9)	3.25***	<0.001
Female, % (95% CI)	37.0 (26.9 to 47.0)	38.0 (27.9 to 48.2)	0	0.997
White race, % (95% CI)	73.9 (64.8 to 83.1)	78.3 (69.7 to 86.8)	0.75	0.451
<u>Utilization (past 12 months)</u>				
ED visits, median (IQR)	2 (0 to 5)	1 (0 to 2)	1.1	0.063
Clinic visits, median (IQR)	7 (2 to 15)	6 (3 to 10.25)	1.01	0.405
Inpatient admissions, median (IQR)	1 (0 to 3.25)	1 (0 to 2)	1.14*	0.0355
<u>Medical history (past 12 months)</u>				
Comorbidity index, median (IQR)	2 (0 to 4)	1 (0 to 2)	1.48***	<0.001
Pulmonary circulation disorders	30.4 (20.9 to 40.0)	17.4 (9.5 to 25.3)	2.33*	0.0334
Renal failure	29.3 (19.9 to 38.8)	5.4 (0.7 to 10.2)	8.33***	<0.001
Tumor	27.2 (17.9 to 36.4)	18.5 (10.4 to 26.6)	1.57	0.186
CHF	38.0 (27.9 to 48.2)	18.5 (10.4 to 26.6)	4**	0.00239
<u>Psychiatric history</u>				
Substance abuse	40.2 (30.0 to 50.4)	25.0 (16.0 to 34.0)	3.33**	0.00969
Depression	60.9 (50.7 to 71)	52.2 (41.8 to 62.6)	1.53	0.198
Anxiety	35.9 (25.9 to 45.9)	50 (39.6 to 60.4)	0.52*	0.0461
Suicide attempt	8.7 (2.8 to 14.6)	6.5 (1.4 to 11.7)	1.4	0.566
Schizophrenia or psychosis	31.5 (21.8 to 41.2)	19.6 (11.3 to 27.8)	1.73	0.0898
Other mood disorder	9.8 (3.6 to 16.0)	16.3 (8.6 to 24.0)	0.5	0.166

Notes:*
p < 0.05,**
p < 0.01,***
p < 0.001