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RESEARCH ARTICLE

Unrecognized physical illness prompting psychiatric admission

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BACKGROUND: We assessed factors that might contribute to clinicians erroneously attributing medically based changes in a patient's mental status to psychiatric illness.

METHODS: Records of 1340 patients admitted to a VA hospital psychiatric unit and 613 to a public hospital psychiatric unit from 2001 to 2007 were reviewed. Cases admitted because of an unrecognized medical disorder underwent further analysis of the preadmission assessment and documented history of mental illness.

RESULTS: Of 1340 patients whose records were reviewed, 55 (2.8%) had a medical disorder that caused their symptoms. Compared with patients admitted to medical units, patients inappropriately admitted to psychiatric units had lower rates of completion of medical histories, physical examinations, cognitive assessments, indicated laboratory and/or radiologic studies, and treatment of abnormal vital signs ($P < .001$ in each case). Among patients admitted to psychiatric units, 85.5% had a history of mental illness vs 30.9% of comparable admissions to medical units ($\chi^2(1) = 35.85$; $P < .001$).

CONCLUSIONS: Key assessment procedures are less likely to be performed in patients with mental status changes who are admitted to psychiatric units than in comparable patients admitted to medical units. Symptoms of patients with a history of mental illness are more likely to be attributed to psychiatric illness than are those of patients without such a history.

KEYWORDS: psychiatry, medical illness, misdiagnosis, admission, mental status

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INTRODUCTION

Psychiatric symptoms are not illness specific and may be caused by a variety of both medical and psychiatric disorders. Although the presence of mental status changes often alerts clinicians to the presence of an underlying medical illness, the fact that medical illness can produce symptoms usually thought to be purely psychiatric remains notably underestimated. Physical illnesses may cause symptoms of depression, anxiety states, apathy, outbursts, personality changes, sexual dysfunction, delusions, hallucinations, psychosis, and manic-like states.[1]

Acute change in mental status has been referred to in the literature by a number of terms, including *altered mental status*, *delirium*, *encephalopathy*, and *acute confusional state*. Studies have shown that alteration of mental status secondary to medical illness may occasionally be incorrectly attributed to a psychiatric disorder.[1-4] A study of 658 consecutive psychiatric outpatients receiving careful medical and biochemical evaluations found an incidence of medical disorders producing psychiatric symptoms in 9.1% of cases.[2] The most frequently observed psychiatric symptoms were depressed mood, confusion, anxiety, and speech or memory disorders. Major illnesses presenting with psychiatric symptoms, in order of frequency, were infectious, pulmonary, thyroid, diabetic, hematopoietic, hepatic, and CNS diseases. Of these patients, 46% were found have medical illnesses previously unknown to either themselves or their physicians. An investigation of 100 state hospital psychiatric patients consecutively admitted to a research ward and screened for physical illness found that 46% of patients had an unrecognized medical illness that either caused or exacerbated their psychiatric symptoms, 80% had physical illness requiring treatment, and 4% had precancerous conditions or illnesses.[1]

One of the most compelling investigations demonstrating the incidence of medical illnesses in patients with altered mental status was performed by Henneman and colleagues.[3] They evaluated 100 consecutive patients, age 16 to 65, with new psychiatric symptoms and found that 63 of the patients had an organic etiology for their symptoms, including 3 who were ultimately found to have cerebrospinal fluid abnormalities following lumbar puncture. In a study of 64 patients with unrecognized medical emergencies inappropriately admitted to psychiatric units from emergency departments, medical diagnoses most often missed included severe intoxication with alcohol or illicit substances, drug or alcohol withdrawal, prescription drug overdose, uremic encephalopathy, hepatic encephalopathy, diabetic ketoacidosis, pneumonia, lithium or anticonvulsant toxicity, and congestive heart failure, followed by several less common etiologies.[4] Factors contributing to misdiagnosis included lack of an appropriate mental status examination (in all cases), inadequate physical examination (43.6%), failure to obtain indicated laboratory studies (34.4%), failure to obtain available medical history (34.4%), failure to address abnormal vital signs (7.8%), and failure to obtain indicated neuroimaging (3.1%).

In a 1994 investigation of emergency medical evaluation of psychiatric patients, Tintinalli and colleagues[5] reviewed the medical records of 298 emergency department patients, with psychiatric complaints, all of whom were admitted to a psychiatric unit. Twelve patients (4%) required acute medical treatment within 24 hours of admission, and the reviewers concluded that emergency department history and physical examination should have identified the acute condition in 83% of the cases.

Researchers have questioned what criteria should define "medical clearance" or sufficient stability for admission to a psychiatric unit.[6,7] In 1999, a protocol providing a comprehensive guideline for assessing and treating patients with altered mental status was formulated by the American College of Emergency Physicians (ACEP).[8] Subsequently, Zun[9] published a concise summary of the evidence-based evaluation of the medical presentations of psychiatric patients.

The purpose of our study was to further assess the factors that contribute to clinicians' erroneously attributing alteration of mental status to psychiatric illness when the patient actually has a medical disorder, and to compare preadmission treatment approaches to patients with altered mental status secondary to a medical disorder ultimately admitted to psychiatric units vs approaches to similar patients admitted to medical units.

Objectives included performing an investigation involving larger numbers of patients than previously studied and comparing findings in current populations with those in the past, particularly before publication of the ACEP guideline and similar reviews. Included in this analysis were factors affecting clinicians' decisions regarding the type of unit to which the patient should be admitted.

TABLE 1
Missed medical diagnoses in patients with altered mental status admitted to a psychiatric unit (N = 55)

Medical diagnosis missed	No. (%)
Hyperglycemia/diabetic ketoacidosis	7 (12.7)
Seizures/postictal state	4 (7.3)
Hypoxia/respiratory insufficiency	4 (7.3)
Congestive heart failure	3 (5.5)
Renal insufficiency	3 (5.5)
Cerebral concussion	3 (5.5)
Medication overdose	3 (5.5)
Medication toxicity (eg, phenytoin, lithium, digoxin)	3 (5.5)
Pneumonia	2 (3.6)
Alcohol intoxication, severe	2 (3.6)
Hepatic failure	2 (3.6)
Hypoglycemia	2 (3.6)
Delirium tremens	2 (3.6)
Electrolyte imbalance	2 (3.6)
Sepsis	1 (1.8)
Opioid overdose	1 (1.8)
Benzodiazepine overdose	1 (1.8)
Adverse side effect of medication	1 (1.8)
Polypharmacy	1 (1.8)
Anemia	1 (1.8)
Lupus erythematosus	1 (1.8)
Cancer	1 (1.8)
Hypertensive encephalopathy	1 (1.8)
Brain tumor	1 (1.8)
Cerebrovascular accident	1 (1.8)
Subdural hematoma	1 (1.8)
Neuroleptic malignant syndrome	1 (1.8)

METHODS

To provide a variety of cases, the records of all patients admitted to an inpatient psychiatric unit at a VA hospital (1340 patients, age 18 to 65 years) and of all patients admitted to a corresponding unit at a general public hospital in the same geographic area (613 patients of the same age range) from January 1, 2001 to December 31, 2007 (a total of 1953 records) were reviewed. All patients had been evaluated in an outpatient clinic or emergency department setting by a licensed physician who made the decision to refer the patient for psychiatric admission.

From these records, all cases of patients admitted because of alteration of behavior or mentation secondary to a serious medical disorder not recognized at the time of admission were selected for further analysis. For the purposes of this study, serious medical disorders were defined as conditions requiring consultation and interventional treatment by an internist or other specialist within 12 hours of admission. Twelve hours was an arbitrary period determined by the researchers based on previous experience with this type of admission.

In no case was there more than one admission of this type per patient in the analysis. Of VA admissions requiring analysis, 76.2% were from the emergency department, 16.7% from outpatient psychiatric clinics, and 7.1% from outpatient primary care and medical clinics; 69.2%, 23.1%, and 7.7% of public hospital admissions requiring analysis were from the emergency department, outpatient psychiatric clinics, and outpatient primary care and medical clinics, respectively.

About one-third of referring physicians at the VA were residents; all referrals at the public hospital were by staff physicians. Of the cases analyzed, 95.2% of VA patients were men, as were 46.2% of public hospital patients; the age range was 18 to 65 (average, 53.2 years for VA patients, 48.8 years for public hospital patients).

The study was conducted under a protocol approved by the Institutional Review Board at each facility. A Health Insurance Portability and Accountability Act (HIPAA) waiver was obtained to review the records, and data were deidentified after collection.

Each case was retrospectively analyzed by 2 independent physicians, who used a checklist to determine whether elements of the initial assessment that would have identified or addressed the underlying medical disorder prior to admission, were performed. These elements included identification of available patient history, treating abnormal vital signs (systolic blood pressure >160 mm Hg or <90 mm Hg, heart rate >120 or <50 beats per minute, respiratory rate >20 breaths per minute), performing an appropriate physical examination, obtaining indicated laboratory and radiologic studies, and completing an adequate assessment of cognitive function. Cases were also reviewed to determine whether records documenting the patient's mental health history were available to the clinician who made the decision to admit that patient to a psychiatric unit. Prior to performing the analyses, the 2 physicians separately reviewed 20 randomly selected charts to assure interrater reliability, with 100% agreement on all elements.

TABLE 2
Comparison of treatment variables between patients admitted to psychiatric units and medical units (N = 55; *df* = 1 in all cases)

Treatment variable	Psychiatric admission, %	Medical admission, %	χ^2	*P* value
Adequate medical history	60.0	92.7	16.32	<.001
Adequate physical examination	60.0	94.5	18.69	<.001
Treatment of abnormal vital signs	80.0	100.0	12.22	<.001
Ordering indicated laboratory and radiologic studies	41.8	90.9	10.45	.001
Ordering indicated neuroimaging	94.5	100.0	3.08	.079
Adequate assessment of cognitive function	30.9	61.8	10.57	.001

Also reviewed were an equal number of cases of patients with an altered mental status secondary to a recognized medical condition, who had been appropriately admitted to medical units. These cases were identified by review of hospital data sheets containing lists of patients admitted and their admitting diagnoses during the study period. Patients selected had been given an admitting diagnosis containing the terms *altered mental status, delirium,* or *encephalopathy* (eg, *encephalopathy secondary to renal failure*).

Characteristics of the group of patients receiving psychiatric admission and the group receiving medical admission—and the assessment approach to each—were compared. Statistical analyses were conducted using the Statistical Package for Social Sciences (version 13.0; SPSS, Chicago, IL). Age, the only continuous variable, was examined using a *t* test. The assumption of equal variance was met. The remaining variables were nominal (categorical) and, thus, groups were compared using the nonparametric cross-tabs procedure and the Pearson chi-square statistical test.

RESULTS

Of the 1953 patients admitted to psychiatric units, 55 (2.8%) had a medical disorder that, during their hospitalization, was ultimately determined to have caused or significantly exacerbated the altered mental status for which they had been admitted. The missed medical diagnoses of patients with altered mental status who underwent psychiatric admission are shown in **TABLE 1**. The rate of missed diagnosis was 3.1% among patients admitted to the VA hospital and 2.1% among those admitted to the general public hospital.

In each case, the diagnosis was established on the medical unit within a matter of hours. Fortunately, none of the patients experienced any serious consequences related to the delay in accurate diagnosis. For all 55 cases reviewed, appropriate treatment of the patients' medical disorders could not have been accomplished on a psychiatric unit because of the inability to administer IV fluids, medications, or oxygen on that unit, and admission to a medical service would have been a more appropriate course of action.

Of the patients inappropriately admitted to psychiatric units, 47 (85.5%) had a history of mental illness already documented in their medical records (27 patients with schizophrenia, 3 with schizoaffective disorder, 8 with bipolar disorder, 4 with depression, 2 with PTSD, and 3 with polysubstance dependence). The patients admitted to psychiatric units and those admitted to medical units did not differ significantly with respect to age, gender, or ethnicity.

Compared with patients admitted to medical units, patients admitted to psychiatric units had lower rates of performance of appropriate medical histories, physical examinations, assessment of cognitive status, treatment of abnormal vital signs, and ordering of indicated laboratory, radiologic, and neuroimaging studies. As shown in **TABLE 2**, with the exception of ordering neuroimaging studies, these differences were statistically significant. Of the patients admitted to psychiatric units, 85.5% had a previously documented history of mental illness in their medical record, whereas only 30.9% of patients admitted to medical units had a documented history of mental illness ($\chi^2(1) = 35.85$; $P < .001$). The remaining patients did not have a prior psychiatric diagnosis.

DISCUSSION

The results obtained in this study are consistent with previous findings that common causes of misdiagnosis in this population include lack of an appropriate assessment of cognition, inadequate physical examination, failure to obtain indicated laboratory studies, failure to obtain available patient history, and failure to address abnormal vital signs. The results also demonstrate that these factors are significantly less likely to have been addressed in patients with mental status changes admitted to psychiatric units than those admitted to medical units, and that patients with a history of mental illness are more likely to have their symptoms attributed to their psychiatric illness than are those without such a history. The rates of admission related to missed medical diagnosis in this study are similar to the 4% rate found by Tintinalli and colleagues in 1994.[5]

The clinical element most often neglected both in the patients admitted to psychiatric units (69.1%) and those admitted to medical units (38.2%) was an appropriate assessment of cognitive function. In this review, many clinicians did not proceed beyond questions about the patient's orientation. Some physicians may feel that the process is too time consuming.[4,10] However, essential aspects of cognition may be easily assessed by a number of brief, reliable structured measures.

The Mini-Mental State Examination,[11] a 30-item instrument that assesses orientation, registration, attention and calculation, recall, and language, and requires 5 to 10 minutes to administer, is the most widely used instrument for measuring cognitive impairment; however, there has been concern in recent years that this instrument might not be the best procedure for detecting mental status changes.[12] The Confusion Assessment Method (CAM), which is intended for use in patients at risk for delirium, can be completed in less than 5 minutes and is easily understood by physicians, nurses, and trained lay interviewers.[13]

Why addressing important issues would be less likely for patients admitted to psychiatric units and those with a history of mental illness is an issue of concern and might be related to a bias against patients with a known history of mental illness. Research has shown that stigma and discrimination related to mental illness is widespread,[14,15] and some medical professionals may stigmatize patients with mental illness. Respondents to a survey of Iowa family practitioners[16] were less likely to believe that a patient had a serious illness when presenting with severe headache or abdominal pain if the patient had a prior history of depression or a long history of somatic complaints without obvious organic etiology, compared with patients who had no such prior history. Respondents were also less likely to report that they would order diagnostic testing for the same patients.

We postulate that psychiatric history may affect clinicians' assessment of disease presence and severity as well as their diagnostic and treatment approaches to patients with a known history of mental illness. Clinicians may sometimes conclude too quickly that a psychiatric patient's alteration of mental status is due to an exacerbation of his or her psychiatric problem. In this study, the high rate of psychotic disorders among the psychiatric diagnoses in the medical records of patients inappropriately admitted to psychiatric units might suggest a particular bias against patients with these diagnoses.

Persons with serious mental illness tend to be in poorer physical health than those without mental illness and are at increased risk for physical morbidity and mortality.[17] In addition, the rate of cigarette smoking among individuals with serious mental illness well exceeds that of the general population.[18] Mentally ill patients are more likely to have comorbid medical conditions than those in the general population; their risk of having pulmonary disease, liver disorders, and diabetes is particularly increased;[19] and there is evidence of disparities in treatment in disorders such as diabetes.[20] For example, although patients with serious mental illness usually receive some services for diabetes, they are less likely to receive the full complement of recommended care.[21]

Psychiatric symptoms may be associated with greater perceived barriers to both mental health and medical treatment in the seriously mentally ill,[22] further complicating their care. Thus, it is important that medical problems in mentally ill patients be given adequate attention. However, the results presented here raise concerns as to whether, in some scenarios, patients with a known history of mental illness receive the medical assessment and treatment they need, or if, in some cases, their physical symptoms are misattributed to their mental illness.

The misdiagnosis of some psychiatric patients with medical problems continues to be an issue. Clinicians

should be able to recognize the signs of altered mental status and initiate an appropriate evaluation to assess the etiology. Important clues about the occurrence of delirium include changes in mental status associated with disorientation, depression of consciousness, development of symptoms over a short period of time, focal neurologic signs, presence of specific physical signs, abnormal vital signs, visual or tactile hallucinations, and lack of history of previous mental illness.[4,8]

A systemic approach to the patient with altered mental status is necessary, including patients with known mental illness. Any changes from a mentally ill patient's baseline should be carefully investigated. The protocol for the initial approach to such patients formulated by ACEP,[8] which provides a comprehensive guideline for assessing and treating patients with altered mental status, is of particular importance.

CONCLUSIONS

Patients with mental status changes who are admitted to psychiatric units are less likely to have been evaluated using key assessment procedures than are comparable patients who are admitted to medical units. Furthermore, medical symptoms of patients with a history of mental illness are more likely to be attributed to psychiatric illness than are comparable symptoms in patients without such a history. It is vital that physicians carefully evaluate all patients with mental status changes using the latest guidelines, such as the ACEP protocol, to ensure that all such patients receive appropriate medical care. ■

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REFERENCES

1. Hall RCW, Gardner ER, Popkin MK, et al. Unrecognized physical illness prompting psychiatric admission: a prospective study. Am J Psychiatry. 1981;138:629-635.
2. Hall RCW, Popkin MK, Devaul RA, et al. Physical illness presenting as psychiatric disease. Arch Gen Psychiatry. 1978;35:1315-1320.
3. Henneman PL, Mendoza R, Lewis RJ. Prospective evaluation of emergency department medical clearance. Ann Emerg Med. 1994;24:672-677.
4. Reeves RR, Pendarvis EJ, Kimble R. Unrecognized medical emergencies admitted to psychiatric units. Am J Emerg Med. 2000;18:390-393.
5. Tintinalli JE, Peacock FW, Wright MA. Emergency medical evaluation of psychiatric patients. Ann Emerg Med. 1994;23:859-862.
6. Weissberg MP. Emergency room medical clearance: an educational problem. Am J Psychiatry. 1979;136:787-790.
7. Riba M, Hale M. Medical clearance: fact or fiction in the hospital emergency room. Psychosomatics. 1990;31:400-404.
8. American College of Emergency Physicians. Clinical policy for the initial approach to patients presenting with altered mental status. Ann Emerg Med. 1999;33:251-281.
9. Zun LS. Evidence-based evaluation of psychiatric patients. J Emerg Med. 2005;28:277-283.
10. Zisook S, Braff DL. Delirium: recognition and management in the older patient. Geriatrics. 1986;41:67-70,72-73,77-78.
11. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state." A practical method for grading the cognitive state of patients for the clinician. J Psychiatric Res. 1975;12:189-198.
12. Crinelli RM, Ostberg P. Folstein's mini-mental state examination: fat chance or slim hope? J Am Geriatrics Soc. 2008;56:171-172.
13. Inouye SK, van Dyke CH, Alessi CA, et al. Clarifying confusion: the confusion assessment method. Ann Internal Medicine. 1990;113:941-948.
14. Crisp AH, Gelder MG, Rix S, et al. Stigmatization of people with mental illness. Br J Psychiatry. 2000;177:4-7.
15. Link AG, Phelan JC, Bresnahan M, et al. Public conceptions of mental illness: labels, causes, dangerousness, and social distance. Am J Public Health. 1999;89:1328-1333.
16. Graber MA, Bergus G, Dawson JD, et al. Effect of a patient's psychiatric history on physicians' estimation of probability of disease. J Gen Intern Med. 2000;15:204-206.
17. Jones DR, Macias C, Barreira PJ. Prevalence, severity, and co-occurrence of chronic physical health problems of persons with serious mental illness. Psychiatr Serv. 2004;55:1250-1257.
18. Dixon L, Medoff DR, Wohlheiter K, et al. Correlates of severity of smoking among persons with severe mental illness. Am J Addict. 2007;16:101-110.
19. Sokal J, Messias E, Dickerson FB, et al. Comorbidity of medical illnesses among adults with serious mental illness who are receiving community psychiatric services. J Nerv Ment Dis. 2004;192:421-427.
20. Sullivan G, Han X, Moore S, et al. Disparities in hospitalization for diabetes among persons with and without co-occurring mental disorders. Psychiatr Serv. 2006;57:1126-1131.
21. Goldberg RW, Kreyenbuhl JA, Medoff DR, et al. Quality of diabetes care among adults with serious mental illness. Psychiatr Serv. 2007;58:536-543.
22. Drapalski AL, Milford JM, Goldberg RW, et al. Perceived barriers to health care among veterans with serious mental illness. Psychiatr Serv. 2008;59:921-924.