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Antipsychotic utilization in the intensive care unit and in transitions of care☆,☆☆

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ABSTRACT

Purpose: The objective of this study was to quantify the rate at which newly initiated antipsychotic therapy is continued on discharge from the intensive care unit (ICU) and describe risk factors for continuation post–ICU discharge.
Materials and methods: This is a retrospective cohort study of all patients receiving an antipsychotic in the ICUs of a large academic medical center from January 1, 2005, to October 31, 2011. Medical record review was conducted to ascertain whether a patient was newly started on antipsychotic therapy and whether therapy was continued post–ICU discharge.
Results: A total of 39,248 ICU admissions over the 7-year period were evaluated. Of these, 4468 (11%) were exposed to antipsychotic therapy, of which 3119 (8%) were newly initiated. In the newly initiated cohort, 642 (21%) were continued on therapy on discharge from the hospital. Type of drug (use of quetiapine vs no use of quetiapine: odds ratio, 3.2; 95% confidence interval, 2.5-4.0; $P < .0001$ and use of olanzapine: odds ratio, 2.4, 95% confidence interval, 2.0-3.1; $P \leq .0001$) was a significant risk factor for continuing antipsychotics on discharge despite adjustment for clinical factors.
Conclusions: Antipsychotic use is common in the ICU setting, and a significant number of newly initiated patients have therapy continued upon discharge from the hospital.

1. Introduction

Antipsychotic medications are frequently initiated in the intensive care unit (ICU) to treat a variety of conditions including, but not limited to, acute psychosis, substance withdrawal, agitation not responding to other therapies, or delirium. Antipsychotics are a potentially attractive alternative to other sedatives because they can, in many circumstances, control acute agitation without suppressing respiratory drive. The most recent guidelines from the Society of Critical Care Medicine [1] indicate that there is no published evidence that haloperidol reduces the duration of delirium in ICU patients and that only weak evidence exists for atypical antipsychotics. Despite the lack of reliable evidence supporting their use in the ICU, antipsychotic agents are used routinely in more than a tenth of all ICU patients [2]. Although a small proportion of this use is in patients who were admitted on these agents, the majority of ICU antipsychotic utilization is for new-onset agitation or delirium [2].

A potential consequence of antipsychotic use in the ICU is the continued use on transition to less acute settings, including on discharge from the hospital. Other classes of medications, including inhaled bronchodilators and proton pump inhibitors, are frequently started during hospitalizations and continued following discharge, many times inappropriately [3,4]. When combined with the multitude of other factors that contribute to medication management in transitions of care, high-risk medications such as antipsychotics may also be continued inappropriately. The rate at which newly initiated antipsychotics are continued following discharge has only been described in a small patient cohort to date [5], and data are lacking regarding the risk factors for continuation outside the hospital setting.

We sought to describe ICU antipsychotic utilization at a large, urban, academic medical center over a 7-year period and to determine if there

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were patient-specific characteristics that increased the likelihood of exposure to newly initiated antipsychotic therapy, and the prevalence/risk factors for continuation of antipsychotic therapy at hospital discharge.

2. Materials and methods

2.1. Setting and design

We performed a retrospective cohort study of all admissions receiving an antipsychotic in the ICUs from January 1, 2005, to October 31, 2011, at the Beth Israel Deaconess Medical Center, a large, urban, tertiary care center in Boston, MA. The hospital's institutional review board approved the study with a waiver of informed consent.

2.2. Data sources

Data were obtained from electronic medical records and medical databases created through usual care. We extracted patient age, race, and sex; comorbidities (as defined by Elixhauser et al [6]); patient-level case-mix; admission source (admission from the emergency department or other); ICU type (medical, surgical, or other type of ICU); day of the week of discharge; length of hospital and ICU stay; total charges; disposition; and in-hospital mortality.

2.3. Patients and definitions

All patients who were at least 18 years of age were identified as receiving an antipsychotic medication through the use of automated dispensing cabinet records. Once identified, we reviewed the medical records of all patients who received an antipsychotic to evaluate whether the antipsychotic therapy was present preadmission or if it was newly initiated while in the ICU. Antipsychotics included in the analysis included haloperidol, aripiprazole, olanzapine, quetiapine, risperidone, and ziprasidone. Those patients deemed to be a new initiation were then evaluated to determine whether the antipsychotic was continued on discharge from the hospital.

We conducted 2 separate analyses. In the first analysis, our primary outcome of interest was the initiation of an antipsychotic during the patient's stay in the ICU. We examined patient-level risk factors (demographics, comorbidities defined using the method of Elixhauser et al [6], and severity of illness using the Diagnosis-related group cost weight of each admission as the individually adjusted case-mix) as well as hospital-level risk factors (admission to medical or surgical ICU, admission from emergency department vs other) for initiation of antipsychotic therapy. We identified delirious patients with the following *International Classification of Diseases, Ninth Revision,* codes, previously used in Swan et al [2]: 290.11, 290.3, 290.41, 291.0 to 291.9, 292.81, 293.0, 293.1, 293.9, 300.11, 308.09, 780.02, and 780.09. The coding of delirium was handled as a binary variable. We also examined secondary analyses of the association of newly started antipsychotics in the ICU and hospital and ICU lengths of stay, total hospital charges, in-hospital death, and likelihood of discharge home. In our second analysis, we restricted our population to those admissions during which antipsychotics were newly started in the ICU and to those patients who survived to discharge. In this analysis, our primary outcome was continuation of these medications on discharge from the hospital. We examined patient- and hospital-level risk factors (as identified in the first analysis) for continuing these medications on discharge. Furthermore, we examined whether patients older than 65 years might be at greater risk for initiation of therapy given that older patients might face more delirium. We specifically explored whether the day of the week of discharge (weekend vs weekday) and the type of antipsychotic (specifically haloperidol, olanzapine, or quetiapine) to which the patient was exposed would be associated with continuation on discharge. We also explored the secondary analysis of the association of continuation of antipsychotics on discharge and total hospital charges, disposition to locations other than home, and likelihood of readmission at 30 days.

2.4. Statistical methods

The unit of analysis was hospital admission. We performed unadjusted comparisons using Student *t* test, the χ^2 test, or the Fisher

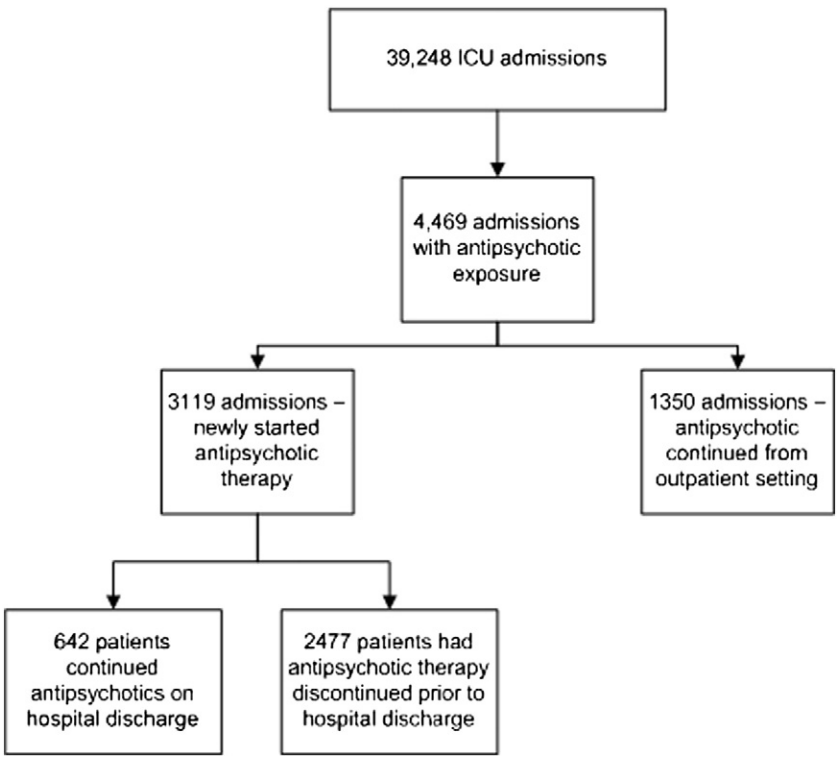

Fig. 1. Patient exposure to antipsychotic therapy.