The cascade of benzodiazepine prescribing for hospitalized geriatric patients

Neshahthari Wijeyakahan cott, Rachel Gruber and Nicholas A. Rattray

ABSTRACT

Background: Hospitalists increasingly provide care for geriatric patients and little is known about the extent to which hospitalists adhere to evidence-based medication guidelines. This study aimed to characterize hospitalist adherence to BEERS guidelines for prescribing and monitoring benzodiazepines for older adults.

Methods: We conducted a retrospective chart review of admitted patients aged 70–85 years who had been prescribed benzodiazepine. Charts from 351 patients were analyzed for documentation and decision rationale, which included 638 separate notes.

Results: Benzodiazepines were prescribed 28.2% of the time to address anxiety, which is inconsistent with the BEERS criteria; 39% had adequate data in the impression and plan section of the note to reflect why benzodiazepine was prescribed. Of note, the majority of notes had partial or missing data.

Conclusion: Physicians tended to follow guidelines more than advance practice providers. Wide variation persists in prescribing practices and documentation related to benzodiazepines and both could potentially be addressed with further training.

1. Background

Hospitalists increasingly care for elderly patients, especially 'baby boomers'[1]. Greater than 40% of hospitalized adults are 65 years and older and by the year of 2030 more than 70 million Americans will be senior citizens [2]. In response to these trends, hospitalists have begun to incorporate geriatric skills into their daily practice [3]. One such skill, and an important patient safety issue is whether hospitalists are currently adhering to evidence-based medication prescribing guidelines for geriatric inpatients.

The ‘BEERS Criteria’ guides providers in medication safety and is designed to reduce patient exposure to potentially inappropriate medications (PIMS). Originally created in 1991, the American Geriatrics Society (AGS) began regulating them in 2011 with updates every 3 years. It is unclear, despite its availability, the extent to which hospitalists adhere to current guidelines in local settings [4].

We conducted a retrospective chart review study to determine if providers were following evidence-based guidelines. The purpose of the study was to assess concordant and non-concordant prescribing of benzodiazepines for hospitalized geriatric patients. We hypothesized that providers were not adhering to recommended guidelines and were not providing adequate rationale for their actions. Understanding the patterns and associations related to prescribing and documenting will help us determine if providers are adhering to the current guidelines.

2. Methods

A retrospective chart review was conducted at an 802- bed tertiary care hospital and non-profit academic medical center with a Level 1 trauma and stroke center. Hospitalists are the admitting providers for most specialties including urology, neurology, nephrology, hematology/oncology, as well as primary internal medicine patients. They collaborate with specialists and are responsible for continuity of care for the acutely ill patients. The daily census for hospitalist care is typically 250–270 patients. Patients included in the chart review were seen by 41 physicians and 24 advanced practice practitioners that comprise the hospitalist service. Patients who were seen by the ACE team (Acute Care of Elderly team) on the day of admission or under the care of the first author were excluded from the study. This study was approved by the IRB.

Charts were reviewed for hospitalized patients between the ages 70–85 between 1 January 2017 and December 31st, 2017 for a 2-week period in the

CONTACT Neshahthari Wijeyakahan Advanced Scholars Program for Internists in Research and Education (ASPIRE), Indiana University (IU) School of Medicine, Indianapolis, IN, 46202. neshi84@yahoo.com

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hospital. In all, 351 charts were reviewed. Data were collected from the electronic medical record database with assistance from affiliated data scientists. Hospitalist notes were reviewed for encounters on the day benzodiazepines were given as per the inpatient pharmacy records; no more than one progress note was analyzed per day. Key elements included adequate documentation of benzodiazepines and the stated rationale for prescribing the medication. A review team consisting of four independent reviewers reviewed the charts. An audit process to monitor accuracy included team meetings where two reviewers read each chart and came to consensus on analysis. Discrepancies were decided by the geriatric hospitalist (1st author). Each chart was coded for adequate, partial or missing information. ‘Adequate’ charts were classified as those with proper documentation and a stated rationale for prescribing benzodiazepines in the note’s impression and plan. ‘Partial’ documentation was defined as the inclusion of rationale and the prescription of benzodiazepines in the note but missing from the impression and plan. ‘Missing’ was defined as no documentation or rationale found for prescribed benzodiazepines. The intent was to determine whether the reasoning for prescribing the particular benzodiazepine was appropriate based on BEERS guidelines. Primary data were collected via direct data capture and stored electronically in REDCap. Data was entered into REDCap (Research Electronic Data Capture) [5]. The R. Student’s t-test, Wilcoxon rank sum test, and chi-square test were used to determine any statistical association between the care team information, patient data, and prescribing appropriateness. A p-value of <0.05 was considered significant.

3. Results

3.1. Patient population

Between 1 January 2017 and 31 December 2017, the hospitalist admitted/consulted 351 patients between the ages of 70–85 years old. Of the 351 patients, 57.8% were female and 42.2% were male; median age was 75.9 years old; 86.9% were White, 11.7% were Black; 40.7% were discharged to home and 37.3% were discharged to rehab (see Table 1).

3.2. Effect of documentation and guideline adherence

638 separate progress notes were reviewed. Based on the quality of progress note documentation, 39.0% were considered ‘adequate,’ 51.3% were ‘partial’ and 9.7% had missing data. Documentation was completed by day-team providers (including MDs and Advanced Practice Providers) 95.5% of the time. Residents accounted for 8.7% of encounters. Based on the rationale provided in the notes, 28.2% of benzodiazepines were prescribed to address anxiety, which is inconsistent with the BEERS criteria (see Tables 2 and 3). In this patient cohort, N = 314 (89%) received benzodiazepines for less than 4 days. N = 37 (11%) received benzodiazepine for more than four days. An example of adequate documentation would be: ‘Alcohol withdrawal—will continue with Librium and taper in 3 days’.

Of the notes written solely by an advanced practice provider (APP) 98% were not guideline concordant. At the same time, 85% of the notes written solely by physicians were not concordant. Physicians were more likely to follow guidelines (p <.05). Progress notes that contained adequate documentation were more likely to display guideline-concordant prescribing practices than those with partial documentation. Whether the providers worked during the day or night or with residents made no difference. Several benzodiazepines were prescribed; the most common were Alprazolam (Xanax), Chlordiazepoxide (Librium), Clonazepam (Klonopin), Diazepam (Valium), and Lorazepam (Ativan). Providers who prescribed Librium always followed guidelines; however, providers did not follow guidelines when prescribing xanax, valium, ativan and klonopin. Ativan was the most frequently non-adherent benzodiazepine prescribed (see Table 2).

4. DISCUSSION

The primary finding from this retrospective chart review suggests that hospitalists in one large medical center are inconsistently following BEERS criteria. While a small minority of providers offered clear documentation of their clinical decisions and rationale for treatment, most providers included scant information. It was noted that providers copied and

| Table 1. Patient characteristics and discharge locations. |
|---------------------------------------------------------|
| Demographics (Patients) | N (%) |
| Male | 148 (42.2) |
| Female | 203 (57.8) |
| Race/Ethnicity | |
| White | 305 (86.9) |
| Black | 41 (11.7) |
| Unknown/Refused | 5 (1.4) |
| Hispanic/Latino | 0 (0.0) |
| Unknown/Refused | 5 (1.4) |
| Age M (Range) | 75.9 (70.0 to 85.00) |
| Marital Status | |
| Single | 31 (8.8) |
| Married | 187 (53.3) |
| Divorced | 35 (10.0) |
| Widowed | 89 (25.4) |
| Other | 4 (1.2) |
| Discharge location | |
| Home | 143 (40.7) |
| Rehab – Subacute Rehab (SAR) or Acute Rehab | 131 (37.3) |
| Died in hospital/Hospice | 28 (8.0) |
| Long Term Acute Care Hospital (LTAC) | 4 (1.1) |
| Unknown/Not reported | 34 (9.7) |
| Nursing Home/Extended Stay | 10 (2.8) |
| Prison | 1 (0.3) |
past[...notes from previous days with minimal changes, which is a well-known issue [6]. This could be due to lack of time to adequately document. However, in 10% of encounters in which medications were prescribed there was no documentation. It is possible that the provider was not aware of the medications given to the patient vs medications given after the documentation was complete. Nonetheless, it is unclear who prescribed the medications. In addition, we found that physicians followed guidelines more than advanced practice providers. This difference was not affected by whether a provider was working day or night nor if a resident was involved in patient care.

In 2019, the BEERS Criteria was updated to include additional medications and a modified grading system. The guidelines are based on AGS criteria, and the evidence and strength measures are based on the American College of Physicians’ (ACP) grading system[4]. Few studies have addressed inpatient use of BEERS Criteria [4,7], particularly with respect to prescribing benzodiazepines for older patients. There are a handful of articles suggesting an association between use of benzodiazepines and adverse effects among geriatric patients [8–12].

Our study analyzed various providers’ Benzodiazepines prescribing and documentation practices for geriatric patients. Given the fact that there is very little literature on the care of geriatric patients during their hospitalizations, this study is a first step in addressing an important gap in knowledge about the growing geriatric population.

For the Benzodiazepines prescribed, as mentioned in the results, Ativan was prescribed for anxiety, which is not guideline concordant [4,13]. For the geriatric population Benzodiazepines can increase the risk of falls and delirium, an adverse event that can increase the morbidity and mortality [12]. It is concerning to note that in our study, 87 patients had delirium and were on benzodiazepines.

If a geriatric patient was truly experiencing anxiety, finding out the underlying cause and providing supportive measures would be the first line of treatment [3,14]. Otherwise prescribing an SSRI (e.g., escitalopram) or SNRI (e.g., Duloxetine) is a better medication for anxiety in geriatric patients [4]. While there is some validity to the claim that prescribing medication is both art and science, clear guidelines do exist for discontinuing or tapering medications in the geriatric population [14]. One specific diagnostic example would be for alcohol withdrawal: while Librium is an appropriate medication, clear instructions need to be given for tapering to discontinue the medication within a certain time frame [11]. This is an important safety issue because of the link between such medications and adverse events among hospitalized older patients.

Our study had notable limitations. The sample size was relatively modest. We limited our sample to inpatients older adults’ age 70 yrs and greater who were followed by the hospitalist team as the primary or consulting service. The study was based in one hospital setting; practices in other hospitals may vary. In addition, it was not possible to know why providers did not document their rationale in

| Reasons                  | N (%) |
|--------------------------|-------|
| Anxiety                  | 181 (28.2) |
| Continued from home medication | 50 (7.8) |
| Confusion                | 44 (6.7) |
| Alcohol Withdrawal       | 42 (6.6) |

## Table 2. Rationale for benzodiazepine use per documentation and providers.

| Components                      | Followed Prescription Guidelines (N = 66) | Not Following Prescription Guidelines (N = 511) | P   |
|---------------------------------|------------------------------------------|-----------------------------------------------|-----|
| **Benzodiazepine Type**         |                                          |                                               |     |
| ALprazolAM                      | 2 (1.9%)                                 | 104 (98.1%)                                   | <0.001 |
| ChloridiazoxidePOXIDE           | 29 (100%)                                | 0                                             |     |
| CLonazePAM                      | 1 (1.4%)                                 | 68 (98.6%)                                    | <0.001 |
| DiazepamPOXIDE                 | 3 (1.9%)                                 | 152 (98.1%)                                   | <0.001 |
| LOprazePOXIDE                   | 28 (13.5%)                               | 179 (86.5%)                                   | <0.001 |
| Multiple                        | 3 (42.9%)                                | 5 (57.1%)                                     | 0.7055 |
| **Documentation Accuracy**      |                                          |                                               |     |
| Adequate                        | 54 (21.7%)                               | 195 (78.3%)                                   | <0.001 |
| Partial                         | 12 (3.7%)                                | 316 (96.3%)                                   |     |
| **Type of Provider**            |                                          |                                               |     |
| MD                              | 59 (14.7%)                               | 343 (85.3%)                                   | <0.001 |
| APP                             | 3 (2%)                                   | 150 (98%)                                     |     |
| Both                            | 4 (18.2%)                                | 18 (81.8%)                                    |     |
| **Provider Shift**              |                                          |                                               |     |
| Day                             | 65 (11.7%)                               | 489 (88.3%)                                   | 0.4496 |
| Night                           | 1 (4.3%)                                 | 22 (95.7%)                                    |     |
| **Provider with resident**      |                                          |                                               |     |
| With                            | 12 (24%)                                 | 38 (76%)                                      | 0.007 |
| Without                         | 54 (10.2%)                               | 473 (89.8%)                                   |     |

## Table 3. Top reasons for benzodiazepine use per documentation.
deciding to prescribe. We do not include the outpatient providers or care.

5. Future direction
In conclusion, there is considerable non-guideline concordant prescribing of medications in the inpatient geriatric population as well as a lack of documentation. Further research is needed to assess and educate providers on safe prescribing of medications for their geriatric inpatients. Interventions such as educational sessions and feedback of performance data can be helpful in creating a best practice protocol for providers.

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ORCID
Neshahthari Wijeyakuanth http://orcid.org/0000-0003-0633-6560
Nicholas A. Rattray http://orcid.org/0000-0002-9683-889X

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