Introduction

- Agitation is common in the emergency department (ED) and can escalate to aggression or violence towards caregivers or other patients if not properly addressed.1
- With diverse clinical reasons for acute agitation, etiology can vary including, intoxication, neurodegenerative, and psychiatric causes.1,2

Treatment

- When verbal de-escalation and non-pharmacologic methods fail, pharmacological agents are needed to quickly calm patients.1,4
- Oral agents are preferred whenever possible, but many patients are too violent or intoxicated and parenteral administration is required.1,2
- Typically, antipsychotics and benzodiazepines are used first-line and come in various formulations.1,4

Cost

- Ineffective management can delay care, result in injury to patient and staff, increase admission time, and drive up the cost of care.3
- Cost effectiveness has not been widely reviewed
- The cost of care may be reduced by up to 20% if high-cost medications such as atypical antipsychotics or droperidol are equally effective compared to low-cost medications such as benzodiazepines or haloperidol

PURPOSE

- To evaluate the clinical and cost effectiveness of pharmacological treatment on adult behavioral health patients experiencing acute agitation and requiring ED admission
- To identify opportunities for cost savings in this high-risk patient population

METHODS

Study Design and Patient Setting

- Retrospective cohort study of adult (age ≥18) patients admitted to a small community hospital between October 1, 2019 and October 1, 2021

Data Collection

- Data was extracted from electronic health records data

Inclusion Criteria

- Patients admitted to the ED and treated for agitation using intramuscular or intravenous medications

Exclusion Criteria

- Pediatrics
- Pregnancy
- Alcohol Withdrawal

Study Drugs:

- Lorazepam, midazolam, droperidol, haloperidol, olanzapine, ziprasidone

RESULTS

Baseline Characteristics

Table 1. Patient Characteristics (n = 65)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (y); (SD)</td>
<td>38.3 (14.5)</td>
</tr>
<tr>
<td>Female Sex</td>
<td>33 (50.7)</td>
</tr>
<tr>
<td>Race</td>
<td>11 (16.9)</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>49 (75.4)</td>
</tr>
<tr>
<td>Non Hispanic or Latino</td>
<td>5 (7.7)</td>
</tr>
<tr>
<td>Refused to Answer or Unknown</td>
<td>37 (56.9)</td>
</tr>
<tr>
<td>≥ 2 medications</td>
<td>23 (35.4)</td>
</tr>
<tr>
<td>Physical Restraints</td>
<td></td>
</tr>
</tbody>
</table>

Financial Impact

Table 2. Cost of Study Medications

<table>
<thead>
<tr>
<th>Study Drugs</th>
<th>n</th>
<th>Cost Per Unit ($)</th>
<th>Total Cost Per Drug ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorazepam</td>
<td>40</td>
<td>0.45</td>
<td>18.00</td>
</tr>
<tr>
<td>Midazolam</td>
<td>8</td>
<td>0.31</td>
<td>2.48</td>
</tr>
<tr>
<td>Droperidol</td>
<td>13</td>
<td>6.59</td>
<td>85.67</td>
</tr>
<tr>
<td>Haloperidol</td>
<td>18</td>
<td>0.56</td>
<td>10.08</td>
</tr>
<tr>
<td>Olanzapine</td>
<td>26</td>
<td>45.09</td>
<td>1172.34</td>
</tr>
<tr>
<td>Ziprasidone</td>
<td>0</td>
<td>42.36</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Figure 1. Distribution of Study Medications

Figure 2. Total Cost of Study Medications

Figure 3. Frequency of Study Medication Administration by Age Groups

RESULTS (CONTINUED)

- Of the 201 charts reviewed, 65 patients met inclusion criteria
- Patient age ranged from 19 to 74 years with a majority between the ages of 30-39 years old (Figure 3)
- Over one-half (56.9%) of patients required administration of at least 2 study medications (Table 1)
- Approximately one-third required physical restraints (35.4%) and/or a Code Gray (30.8%) due to their increased agitation during hospital stay (Table 1)
- Ziprasidone was not administered during the study period (Figure 1)

Cost

- Olanzapine was the most expensive study medication (Figure 2)
- Total financial impact during the study period was $1288.57 (Table 2)

DISCUSSION

- Olanzapine represents nearly 91% of total medication cost
- Lorazepam is 89% less expensive than olanzapine
- If olanzapine use was reduced by 50% and substituted for lorazepam, this would reduce the total cost by 45%
- Cost savings would be exponentially greater at larger hospitals where utilization of atypical antipsychotics is more frequent

LIMITATIONS

- Retrospective, non-randomized, single-center study
- Small sample size
- Inconsistencies in electronic medical record documentation of code gray and physical restraints
- Several medications given together as treatment ‘cocktails’
- No standardized agitation assessment completed to assess medication effectiveness

GOING FORWARD

- Complete statistical analysis for study medication effectiveness and patient outcomes
- Develop a standardized algorithm for drug selection in the treatment of agitation for ED staff

REFERENCES