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Original Contributions

CHARACTERISTICS AND SEVERITY OF AGITATION ASSOCIATED WITH USE OF SEDATIVES AND RESTRAINTS IN THE EMERGENCY DEPARTMENT

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☐ **Abstract—Background: Agitated patients frequently present to emergency departments, but limited evidence exists regarding clinical decisions to use chemical sedatives and physical restraints. Objective: We examined attributes and levels of agitation impacting thresholds for sedative and restraint use in the emergency setting. Methods: This was a secondary study focusing on agitation characteristics within a prospective observational study of agitated patients in the emergency department at an urban, tertiary referral center. We recorded scores on 3 validated agitation scales: the Agitated Behavior Scale, the Overt Aggression Scale, and the Severity Scale. Consecutive patients requiring security presence or scoring ≥1 on an agitation scale were enrolled during randomized 8-h blocks. Results: Ninety-five agitation events on unique patients were observed. The median age was 42 years, and 62.1% were male. Highest frequency triage chief complaints were alcohol/drug use (37.9%) and psychiatric (23.2%). Most events (73.7%) were associated with sedative or restraint use. Factors related to treatment course or interactions with staff were commonly cited (56.8%) as the primary etiology for agitation. A logistic regression model found no association between demographics and odds of sedative/restraint use. Overt Aggression Scale scores were associated with significantly higher odds of sedative use (adjusted odds ratio [AOR] 1.62 [range 1.13–2.32]), while Severity Scale scores had significantly higher odds of restraint use (AOR 1.39 [range 1.12–1.73]) but significantly lower odds of sedative use (AOR 0.79 [range 0.64–0.98]). Conclusion: External factors may be important targets for behavioral techniques in agitation management. Further study of the Severity Scale scale may allow for earlier detection of agitation and identify causal links between agitation severity and use of sedatives and restraints.**

☐ **Keywords—agitation; behavioral emergencies; restraints; sedatives**

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INTRODUCTION

Behavioral complaints presenting to the emergency department (ED) are rapidly rising in the United States. There has been a 50% increase in the number of ED visits for behavioral disorders nationwide between 2006–2011 compared with only an 8.6% increase in overall visits (1). Agitation often occurs during these patient encounters, with 1.7 million events occurring annually in emergency

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settings alone and an estimated ED prevalence of 2.6% (2,3). Health care workers use multiple techniques to treat agitation, including the use of physical restraints and the administration of appropriate chemical sedatives when agitation escalates or rapid control of the situation is necessary (4).

Treatment using these measures, however, can cause significant safety threats for patients. Although physical restraints are commonly used in the ED, serious adverse events have been cited in the restraint process, including lasting psychological distress, blunt chest trauma, aspiration, respiratory depression, and asphyxiation leading to cardiac arrest (5,6). In addition, a systematic review reported that ≤37% of chemical sedation was complicated by respiratory compromise, QT prolongation, paradoxical increase in agitation, or death (7). To reduce patient harm, experts have recommended the use of validated scales to help clinicians detect early signs of agitation and to intervene before the need for use of sedatives and restraints (8).

Currently, literature regarding agitation scales and attributes in the ED setting is limited. Experts have called for standardized metrics to assess, measure, and quantify agitation to help standardize thresholds to initiate treatment and create benchmarks for rigorous reporting in research studies and intervention designs (9). However, agitation presents differently across specialties and clinical settings, affecting the language and definitions used to define associated behaviors measured within agitation instruments depending on the context and etiology. Challenges to measuring agitation are compounded in the ED when patients are often undifferentiated and multifactorial in the early phases of their clinical course (10,11).

Direct observation of agitation events *in situ* may provide a more objective depiction of agitation characteristics leading to sedative and restraint use along the entire ED care delivery system. Therefore, we performed a series of prospective observations to examine the clinical and systems characteristics related to the use of sedatives and restraints when treating agitation in the ED (12). In the primary study, we objectively measured a range of factors that may impact decisions to use sedatives and restraints during these encounters, including patient demographics, staff/health care team characteristics, and logistical attributes of the ED environment and health care system.

This current follow-up study aims to describe specific characteristics of agitation and measure agitation severity using validated scales within this prospective cohort. We also aim to analyze any potential bias or specific thresholds for level of agitation associated with sedative or restraint use using a logistic regression model. We believe that these direct measurements of agitation will aid in minimizing the use of sedatives and restraints while maintaining staff and patient safety in the emergency setting.

MATERIALS AND METHODS

Study Design and Setting

Study design and methodology are in line with those previously published in the primary descriptive study (12). In brief, we prospectively enrolled adult patients (≥18 years of age) with acute agitation during their ED visit through observations performed during 8-h blocks by 4 trained research associates (RAs). We scheduled RAs via a randomization tool to encompass enrollment hours between 11 AM and 2:59 AM (for all 7 days, 80 h per week). The clinical site was an academic referral center with an average annual adult ED volume of approximately 100,000 visits situated in an urban midsize city in New England. A recent study revealed a significant burden of agitated patients during their visit to this ED, with approximately 1,200 physical restraints placed per year on average between 2013–2015 (13). Eligibility included any clinical encounter that required a response from protective services personnel. Two officers were permanently stationed in the ED and immediately responded to any escalating patient agitation that impacted safety. Responses were the result of either staff requesting assistance (via a radio transceiver or in person) or direct initiative by the officers. In addition, RAs regularly walked through the entire clinical unit to identify early cases of escalating patient agitation that may not yet involve protective services. All areas of the adult ED, which encompassed 3 separate care areas, 4 resuscitation bays, and 56 beds plus additional potential hallway spots were eligible except for the psychiatric emergency unit. This study was approved by the Yale University Institutional Review Board.

Data Collection and Measurements

Before the data collection period, the RAs received 3 rounds of training on the use of agitation scales and determination of clinical factors contributing to use of sedatives and restraints. In each round, they first performed individual observations and scale ratings while watching a 15-min video recording of simulated encounters between an ED clinical staff team and a standardized agitated patient actor created as part of a previous research study (14). The lead author, an emergency physician with expertise in health care simulation and agitation research, then met with the RAs to provide feedback and facilitate team calibration before entering another round of video observations and consensus building. A health worker aggression exposure research expert (Dr Iennaco)

contributed to the development of the observation instrument to confirm content validity. Finally, RAs participated in orientation shifts as pairs in the actual ED environment to practice conducting observations *in situ*, with the lead author guiding them through the process and auditing their measurements after each observation. We calculated interrater reliability for each of the measured scales between RAs over 5 sessions and reached $\kappa > 0.80$ before the initiation of definitive data collection.

The RAs performed all observations at a distance from the patient and did not directly speak or interact with any individuals during the actual observations to minimize impact on clinical care or the encounter itself. Two RAs were medical students and 2 had extensive clinical experience as ED scribes. RAs recorded their observations of behaviors, interpersonal dynamics or interactions, and physical characteristics that were witnessed during the encounter to accurately reflect clinical parameters at the time of agitation and to mitigate potential reporting bias by staff members. For some of the factors where accurate data could not be obtained or determined via direct observation, RAs performed a subsequent chart review in the electronic health record.

Agitation Scales and Characteristics

We included the use of 3 validated agitation scales (Table 1) to quantitatively measure the level of aggression and violence displayed during these observed events. A systematic review identified 13 scales used in the assessment of agitation and aggression across multiple treatment settings, and we performed a manual appraisal of each scale for the purposes of inclusion in our instrument (18). We chose the 2 scales that have been successfully used in the ED and would provide robust and comprehensive representation of the agitation events. The Agitated Behavior Scale (ABS) includes 14 items: attention-related behaviors, impulsivity/impatience, uncooperativity, violence/threats, unpredictable anger, self-stimulating behavior, resistance to restraint, wandering, restlessness, repetitive behaviors, loud/excessive talking, sudden changes of mood, excessive crying or laughter, and self-abusive behavior (15). All items are rated on the following 4-point scale: 0 = absent; 1 = present to a slight degree; 2 = present to a moderate degree; and 3 = present to an extreme degree. The Overt Aggression Scale (OAS) is a checklist of 16 items that is used to evaluate verbal aggression and physical aggression against self, objects, and others (16). In addition to the ABS and OAS, we included the Severity Scale (SS) published subsequent to the systematic review that was specifically designed for prospective collection of data relevant to ED violence against health care workers and characterization of ED agitation/violence (17). The SS includes 4 categories: verbal harassment (cursing, yelling, racial slurs, and humiliating and patronizing actions), physical threats (actions, statements, or nonverbal messages conveying threats of physical injury), physical assaults (ranging from spitting/slapping to any hitting with body part/object), and sexual harassment (unwelcome sexual advances and requests for sexual favors). Each category includes a severity rating on a 6-point Likert scale to a total of 24 points.

For all 3 agitation scales, RAs recorded the highest observed level of agitation either until immediately before the implementation of sedatives or restraints or over the entire encounter if none were used. The observation period started either upon arrival of protective services officers to the bedside or if the patient attained a score of ≥ 1 on any of the 3 agitation scales, whichever occurred first. RAs concluded the observations once staff members returned to their usual clinical duties not related to the agitation event. Our primary outcome was the use of either physical restraints or chemical sedatives during the observation period of the agitation events. RAs also assigned a primary agitation etiology observed during the encounters out of a list of 8 categories specific to ED agitation operationalized by previous studies (12,17). If multiple etiologies were identified, RAs chose the category that represented the most significant or dominant cause for agitation during the observed encounter. We collected clinical outcomes of final disposition and length of stay for the ED patient visit subsequent to each observed agitation event.

Statistical Analysis

We manually entered data into Microsoft Excel (version 14.0; Microsoft, Redmond, WA) and then transferred into SPSS (version 22.0; IBM Corp, Armonk, NY). We examined data for normality and homogeneity in each analysis. We also examined for missing data and no cases were missing for all events. We used frequencies and proportions for categorical data and summarized continuous data with means and standard deviations (SDs) or medians and interquartile ranges (IQRs), as appropriate. For the bivariable analyses, we conducted Pearson χ^2 or Fisher exact tests for categorical data as appropriate, independent t tests for normal continuous data, and Wilcoxon-Mann-Whitney U tests for nonparametric data. We did not make correction of p values for multiple comparisons.

To predict agitation severity associated with restraint or sedative use (the primary outcomes), we fitted multivariable logistic regression models controlling for patient demographics and individual agitation scales. We assessed predictors included in the logistic regression

Table 1. Brief Summary of Agitation Scales Used in the Observation Instrument

Scale	Source	Type	Description
Agitated Behavior Scale	Zun *et al.*, 2008 (15)	Scaled checklist	List of 14 items describing agitated behaviors, each rated on a 4-point scale from "absent" to "present to an extreme degree"
Overt Aggression Scale	Yudofsky *et al.*, 1986 (16)	Checklist	List of 16 items describing aggressive behaviors, grouped into 4 categories: verbal aggression, physical aggression against objects, physical aggression against self, and physical aggression against other people
Severity Scale	Kowalenko *et al.*, 2012 (17)	Behaviorally anchored rating scale	Four categories of behaviors, each rated on a 6-point severity scale: verbal harassment, physical threat, physical assault, and sexual harassment

models for collinearity using variable inflation factors and the Hosmer–Lemeshow statistic to determine model goodness of fit (19). We determined confidence intervals (95%) by bootstrap analysis. $p \leq 0.05$ was considered statistically significant.

Our primary aim was to compare differences in clinical factors between subsets of agitated patients where sedatives and restraints were or were not applied. Given that patients requiring sedatives and restraints were likely more agitated, we used differences in measurements of agitation severity to ensure an adequate sample in our study. Based on a previous observational study measuring the ABS scale in restrained versus unrestrained patients and using a SD of 5, we calculated a sample size of at least 72 patients necessary for an 90% power and type I error = 0.05 to detect a ≥3-point difference in mean ABS scores to give an effect size of $d = 0.6$ (15).

RESULTS

Sample Characteristics

Between June and August 2017, a total of 95 agitation events on unique patients were observed during enrollment hours. Sample characteristics of this cohort were previously described and summarized in Table 2. With regard to clinical outcomes, 13.7% were admitted, 60.0% were discharged, 23.2% were placed in psychiatric observation, and 3.2% left against medical advice. The median length of ED stay was 356 min (IQR 230–549 min).

Association with Sedative or Restraint Use

Within our cohort, 26.3% of patients did not receive sedation or physical restraints, 7.4% of patients only received sedatives, 30.5% of patients had only physical restraints placed, and 35.8% of patients received both sedation and restraints. For agitation characteristics (Table 3), the 2 most common etiologies of agitation were disagreement over the course of treatment or disposition (23.2%) and patient disinhibition from drugs/alcohol, mental illness, or cognitive impairment (23.2%). Most events were caused by factors related to the course of treatment or interactions with staff (56.8%), while a minority (43.2%) were caused either by patient disinhibition or by no identifiable or unclear cause. No associations were seen for agitation etiology with either sedative or restraint use. Both mean total ABS and OAS scores were significantly associated with both restraint use and sedative use. Mean ABS scores were significantly higher for events with sedative use (22.9 vs. 17.9, $p = 0.01$) and significantly higher for events with restraint use (22.2 vs. 15.5, $p < 0.01$). Similarly, mean OAS scores were significantly higher for events with sedative use (5.3 vs. 3.7, $p < 0.01$) and significantly higher for events with restraint use (5.0 vs. 2.9, $p < 0.01$). However, while SS scores were significantly higher for events with restraint use (12.0 vs. 7.0, $p < 0.01$), there was no significant difference between SS scores for events with or without sedative use (11.1 vs. 10.1, $p = 0.249$).

Regression Analysis

In the multivariable logistic regression model (Table 4), none of the patient demographics had a significant association with odds of sedative or restraint use. The 3 agitation scales were not collinear and therefore were included in the same model. Adjustment removed any significant associations with ABS scores. However, significance remained after adjustment between OAS scores and odds of sedative use (adjusted odds ratio [AOR] 1.62 [95% CI 1.13–2.32], $p < 0.01$) but not with odds of restraint use. Although the unadjusted OR was not significant for

Table 2. Patient Characteristics and Clinical Outcomes

Patient Characteristics	N = 95
Median age, y (IQR)	42 (32–57)
Gender, n (%)	
Male	59 (62.1)
Female	36 (37.9)
Race, n (%)	
White	54 (56.8)
Black	29 (30.5)
Other	12 (12.6)
Ethnicity, n (%)	
Non-Hispanic	78 (82.1)
Hispanic	17 (17.9)
Triage chief complaint, n (%)	
Alcohol/drug use	36 (37.9)
Psychiatric/mental health	22 (23.2)
Medical illness	9 (9.5)
Trauma	9 (9.5)
Delirium/altered mental status	8 (8.4)
Other/multiple	11 (11.6)
EMS reports of alcohol/drug use, n (%)	
No/uncertain	33 (34.7)
Yes	62 (65.3)
Apparent impairment, n (%)	
None	12 (12.6)
Alcohol/drug intoxication	46 (48.4)
Mental/psychiatric	13 (13.7)
Neurologic/cognitive	5 (5.3)
Multiple	19 (20.0)
Median ED visits in past year (IQR)	3 (0–8)
Clinical outcomes	
Disposition, n (%)	
Admitted	13 (13.7)
Discharged	57 (60.0)
Psychiatric observation	22 (23.2)
AMA	3 (3.2)
Median length of stay in the ED (IQR)	356 (230–549)

AMA = against medical advice; ED = emergency department; EMS = emergency medical services; IQR = interquartile range.

SS scores with sedative use, adjustment revealed that higher SS scores had a lower likelihood of sedative use (AOR 0.79 [95% CI 0.64–0.98], $p = 0.03$). On the other hand, higher SS scores had a significantly higher odds of restraint use even after adjustment (AOR 1.39 [95% CI 1.12–1.73], $p < 0.01$).

DISCUSSION

Our study described agitation characteristics and levels of severity associated with sedative and restraint use for a prospective cohort in a general ED population through direct observations of clinical encounters. Most patients received sedatives or restraints during the agitation event. However, the etiology of agitation was complex and varied, differing from one agitation event to the next. We saw associations between higher agitation scores and odds of sedative and restraint use. Specifically, an increased score on the SS independently predicted higher odds of restraint use but lower odds of sedative use within our regression model. We hope that this prospective characterization can accurately describe thresholds of agitation associated with sedative and restraint use, allow for earlier detection of agitated behavior, and help build future studies to measure and investigate agitation in a structured, rigorous fashion.

Although agitation is a common and growing problem in the ED, limited research exists that directly describes management of this condition in the actual clinical environment (2). The pathophysiology of agitation is complex and may be undifferentiated in the acute setting, posing challenges in creating rigorous measurements and pinpointing identifiable causes to facilitate treatment plans.

Table 3. Agitation Characteristics Associated with Sedative or Restraint Use

	Sedatives Used			Restraints Used		
	No (%)	Yes (%)	*p* Value	No (%)	Yes (%)	*p* Value
N	54	41		32	63	
Agitation etiology			0.12			0.48
Pain/discomfort induced during visit	3 (5.6)	3 (7.3)		2 (6.3)	4 (6.3)	
ED inadequately addressing patient's needs	3 (5.6)	4 (9.8)		3 (9.4)	4 (6.3)	
ED refused to provide medication to patient	2 (3.7)	0 (0.0)		1 (3.1)	1 (1.6)	
Disagreement over course of treatment or disposition	16 (29.6)	6 (14.6)		8 (25.0)	14 (22.2)	
Anger regarding patient's condition	4 (7.4)	4 (9.8)		5 (15.6)	3 (4.8)	
Patient agitated by staff member(s)	8 (14.8)	1 (2.4)		2 (6.3)	7 (11.1)	
Patient disinhibition from drugs/alcohol, mental illness, or cognitive impairment	9 (16.7)	13 (31.7)		4 (12.5)	18 (28.6)	
No identifiable/unclear cause	9 (26.7)	10 (24.4)		7 (21.9)	12 (19.0)	
Mean ABS score (SD)	17.9 (8.3)	22.9 (9.5)	0.01	15.5 (7.9)	22.2 (9.0)	<0.01
Mean OAS score (SD)	3.7 (2.2)	5.3 (2.9)	<0.01	2.9 (2.1)	5.0 (2.6)	<0.01
Mean Severity Scale score (SD)	10.1 (4.2)	11.1 (4.4)	0.25	7.7 (2.8)	12.0 (4.2)	<0.01

ABS = Agitated Behavior Scale; ED = emergency department; OAS = Overt Aggression Scale; SD = standard deviation.

Table 4. Logistic Regression Model with Unadjusted and Adjusted Analyses of Odds of Sedative and Restraint Use

	Odds of Sedative Use				Odds of Restraint Use			
	OR (95% CI)	*p* Value	aOR (95% CI)	*p* Value	OR (95% CI)	*p* Value	aOR (95% CI)	*p* Value
Age	0.99 (0.96–1.02)	0.44	1.01 (0.97–1.05)		0.97 (0.94–1.04)	0.45	1.00 (0.95–1.04)	0.81
Gender								
Male	Ref	—	Ref	—	Ref	—	Ref	—
Female	0.91 (0.39–2.10)	0.82	0.85 (0.29–2.59)	0.79	1.03 (0.43–2.47)	0.96	1.09 (0.30–4.00)	0.89
Race								
White	Ref	—	Ref	—	Ref	—	Ref	—
Black	1.68 (0.68–4.19)	0.26	2.67 (0.77–9.28)	0.12	1.21 (0.46–3.17)	0.70	2.94 (0.15–59.2)	0.48
Other	1.12 (0.32–4.00)	0.86	0.33 (0.03–3.19)	0.33	1.09 (0.29–4.08)	0.90	1.76 (0.45–6.87)	0.41
Ethnicity								
Non-Hispanic	Ref	—	Ref	—	Ref	—	Ref	—
Hispanic	1.12 (0.42–3.47)	0.72	3.07 (0.41–23.1)	0.27	0.92 (0.31–2.76)	0.88	0.63 (0.05–7.69)	0.71
Previous ED visits	0.95 (0.90–1.01)	0.14	0.97 (0.91–1.04)	0.43	0.95–(0.90–1.01)	0.12	0.97 (0.90–1.04)	0.38
ABS score	1.07 (1.01–1.12)	0.01	1.06 (0.97–1.16)	0.23	1.09 (1.03–1.15)	<0.01	0.99 (0.91–1.08)	0.85
OAS score	1.29 (1.08–1.55)	<0.01	1.62 (1.13–2.32)	0.01	1.47 (1.17–1.85)	<0.01	0.99 (0.68–1.43)	0.94
Severity Score	1.06 (0.96–1.17)	0.25	0.79 (0.64–0.98)	0.03	1.36 (1.17–1.57)	<0.01	1.39 (1.12–1.73)	<0.01

ABS = Agitated Behavior Scale; aOR = adjusted odds ratio; CI = confidence interval; ED = emergency department; OAS = Overt Aggression Scale; OR = odds ratio.

Our cohort included significant representation of alcohol/drug use and psychiatric chief complaints, similar to findings from other recent prospective studies of ED agitated patients (3,20). However, we also found a spectrum of other chief complaints, including delirium/altered mental status, medical illness, and trauma, as well as patients with multiple co-complaints. Thus, our results indicate a need to tailor agitation work-up and management carefully with individual patients to identify organic causes that may be reversible before the administration of sedatives and the use of physical restraints (21).

Another management challenge is to identify the underlying etiology for agitation at the time of the event. Although chief complaints and medical diagnoses may represent the reasons for presentation to the ED and contribute to patients' agitation through disinhibition, they may not adequately explain behavioral changes from one moment of a visit to the next, especially when escalating aggression can often be abrupt. Considerations for patient motivations and interactions that may exacerbate or cause agitation in the ED are important, because emergency physicians are required to rapidly stabilize the acute crisis while simultaneously avoiding the use of sedatives and restraints if possible. We attempted to identify these considerations by describing etiologies of agitation with interactional and motivational definitions that operationalize multiple levels of the health system rather than the traditional use of medical complaints and diagnoses. As a result, we found that the large proportion of etiologies for agitation in our cohort were related to external and environmental factors, including disagreement between staff and patients, pain or discomfort during the visit, and inadequate addressing of patients' needs. These causes may have been initially addressed through behavioral techniques, including extra attention to form a therapeutic alliance and targeted verbal de-escalation (22).

Although reducing the use of restraints and sedatives is critical for patient safety, challenges specific to the ED may pose barriers for health care workers to implement recommended behavioral strategies. Our previous analysis of ED agitation identified elevated levels of violence, more immediate threats to personal safety, staffing limitations, communication failures, and environmental pressures as reasons that limit the ability to use verbal and behavioral techniques effectively (23). Behavioral techniques likely will need to be tailored specifically for the unique characteristics of ED agitation to be effective. This includes consideration of a broad range of patient classes with specific focus on alcohol/drug use and mental illness, as well as early identification and intervention with de-escalation using a structured algorithm to guide clinical intervention.

Our multivariable model found no significant associations between demographics and odds of sedative or restraint use in our cohort of ED-agitated patients. However, this may be because our sample size was calculated to detect differences in agitation severity rather than patient characteristics. Interestingly, although higher scores on both the ABS and OAS were significantly associated with use of restraints and sedatives in the bivariable analyses, our model found that adjusted odds ratios were not significant with ABS, and only for sedative use with OAS. On the other hand, the unadjusted OR was not significant for sedative use with SS, but adjusted odds demonstrated a negative association. The SS also had significant adjusted odds for restraint use in the model. Our results seem to indicate that the SS independently predicted lower odds of sedative use and higher odds of restraint use.

Staff members may have limited time to document and assess symptoms effectively as violence escalates with volatility. Previous researchers have attempted to address this by applying the OAS and ABS scales to ED patients, while the SS was developed specifically with ED use in mind (17,18). The differences we found between the agitation scales' ability to discern odds of sedative and restraint use in our cohort may be caused by the design of the instruments. Both the ABS and OAS consist of a checklist of specific behaviors of agitation (easy distractibility, restlessness or pacing, makes loud noises, throws objects down, and strikes or kicks). The SS is a behaviorally anchored scale that rates 4 types of assaultive behaviors and may capture a more holistic assessment of agitation that better reflects clinical thresholds to initiate physical restraint use. The negative correlation between SS scores and sedative use may potentially reflect logistical, systems, or clinical barriers to administering sedatives to more agitated patients. This could include safety considerations for health care workers when sedatives require proximity of a sharp needle to a volatile situation, or differences between nursing-driven orders for physical restraints vs. physician-driven orders for sedatives. Additional research needs to be completed to confirm and investigate potential negative confounders for sedative use and the SS.

Limitations

Our study may be limited in its generalizability to other regions, especially in more rural areas. Patient populations and clinical management of agitation vary between institutions, municipalities, and states. Our results may be subject to care delivery processes and protocols unique to our ED or local geographic region. Although our study is prospective in nature, selection bias and observation bias may still occur because of reliance on observers enrolling agitation events and being aware of the outcomes of interest during the data collection period. All data recorded as a result of direct observation may be subject to misinterpretation by the RAs. Although all 4 RAs were trained in an identical fashion, there may be differences in interpretation of clinical events between individual RAs. However, our RAs were trained using recorded videos and subsequently coached in pairs during live observations with audits of their data collection and assurance of good interrater reliability to minimize these potential limitations. Despite being operationalized by previously published literature, categories created for chief complaints and agitation etiology may potentially lead to loss of information. Finally, because of the inability to enroll 24 h a day, 7 days a week and for a longer period of time, our results only represented a subset of the ED-agitated patient population at large. However, in order to mitigate this issue, we performed randomization of the RA observation time blocks that encompassed all 7 days of the week and all hours of the day except between 3 AM and 10:59 AM when we anticipated a lower incidence of agitation events. Our data collection period consisted of the summer months of June, July, and August, and may be subject to seasonal variations in agitation events that occur in the ED.

CONCLUSIONS

Our prospective cohort of agitated patients in the ED included significant representation of alcohol/drug intoxication and psychiatric illness but also demonstrated a breadth of patient classes and diagnoses. Interactional and external factors contributed to patients' agitation that may be potential targets for verbal and behavioral techniques before the use of sedatives and restraints. The SS demonstrated independent association of agitation with higher use of restraints but lower use of chemical sedatives, and may serve as a potential target for standardized measurement in ED agitation research and further investigation of factors that impact provider clinical decision making at the bedside.

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ARTICLE SUMMARY

1. Why is this topic important?

Agitation events are rising in the emergency department (ED) because of an increasing burden of behavioral health visits, but limited evidence exists to help guide clinicians in the safe management of behavioral emergencies. This leads to challenges in deciding when and how to use physical restraints and sedatives to ensure the safety of agitated patients and ED staff caring for them.

2. What does this study attempt to show?

Using a prospective cohort of agitation events, the study attempts to determine characteristics and thresholds of agitation associated with the use of restraints and sedatives in an urban academic tertiary care ED.

3. What are the key findings?

Alcohol/drug use and psychiatric chief complaints predominated as reasons for visits to the ED with agitation events in our sample. Factors related to dissatisfaction with treatment course or interactions with staff were common reasons for patients becoming agitated. A higher Severity Scale score, an agitation measurement instrument developed by Kowalenko et al. for violent events in the ED, was associated with significantly higher odds of restraint use but significantly lower odds of sedative use.

4. How is patient care impacted?

Interactional and external factors contributed to patients' agitation that may be potential targets for verbal and behavioral techniques before the use of restraints and sedatives. SS scores demonstrated independent association of agitation with higher use of restraints but lower use of chemical sedatives and may serve as a potential instrument for further investigation of factors that impact provider clinical decision making at the bedside. The negative correlation between SS scores and sedative use may potentially reflect logistical, systems, or clinical barriers to administering sedatives to more agitated patients.