RESEARCH ARTICLE

Analyzing Incidence and Risk Factors for Delirium in Non–Intensive Care Pediatric Patients

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ABSTRACT

OBJECTIVES: Our study aimed to identify the incidence of delirium in the inpatient setting outside of intensive care and recognize potential risk factors for delirium.

METHODS: We conducted a single-center retrospective study analyzing patients on general pediatric floors between September 2022 and January 2024 who screened positively using the Cornell Assessment of Pediatric Delirium (CAPD) tool. Delirium diagnosis was attested by a 2-person clinical team based on the DSM-5 criteria using retrospective clinical data. Incidence of delirium was calculated from the patient population with positive CAPD scores. A logistic regression model was used to assess the association between clinical delirium diagnosis and potential clinical risk factors.

RESULTS: Of 245 patients with positive CAPD scores, 83 (33.9%) were deemed to have delirium through retrospective medical record review. Of those 83 patients, only 11 (13.3%) were diagnosed with delirium during their stay. Factors associated with increased odds of delirium included exposure to midazolam, diphenhydramine, hydroxyzine (odds ratios [ORs] of 2.59 [95% CI, 1.47–4.56], 3.4 [95% CI, 1.59–7.30], and 4.3 [95% CI, 1.42–13.0], respectively), diagnosis of sepsis (OR, 3.15; 95% CI, 1.46–6.81), and length of stay (LOS) greater than 5 days (OR, 1.90; 95% CI, 1.11–3.26).

CONCLUSIONS: Approximately one-third of patients who screened positive for delirium on the pediatric medical floor had symptoms consistent with delirium. Sepsis, LOS greater than 5 days, and exposures to specific sedatives and antihistamines are risk factors for developing delirium. Future research may focus on improving screening and understanding the role of risk factors in delirium.

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Drs George and Beam conceptualized and designed the study, designed the data collection instruments, collected data, carried out the initial analyses, drafted the initial manuscript, and critically reviewed and revised the manuscript. Mr Knapp and Dr Andersen conceptualized and designed the study, designed the data collection instruments, carried out the initial analyses, and critically reviewed and revised the manuscript. Dr Leingang and Ms Dean helped design the study, collected data, carried out the initial analyses, and critically reviewed and revised the manuscript. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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INTRODUCTION

Delirium is an acute transient disorder of global brain function associated with underlying physical illness leading to an acute change or fluctuation in baseline awareness with altered behavior or cognition.[1,2] Features of pediatric delirium include agitation, developmental regression, inability to be consoled by the caregiver, affective lability, and sleep-wake disturbance.[3] It can be classified into hyperactive, hypoactive, or mixed delirium subtypes.[1,3]

Delirium is often underrecognized in children, partly because of communication limitations in children, developmental variability, and overlap with other conditions such as pain and from a lack of standardization of prevention, evaluation, and management in the inpatient setting.[1,4] In hospitalized pediatric patients, delirium is associated with longer hospitalizations, increased hospital costs, higher mortality rates, and long-term neuropsychiatric complications.[5–9] The incidence of delirium has been extensively studied in adults, but the pediatric population rate is reliant on literature from the pediatric intensive care unit (PICU) setting. Few studies have analyzed rates of delirium in non–intensive care settings,[7,10] even though the inpatient setting has several risk factors that could contribute to delirium.[3] Studies from the PICU estimate rates of pediatric delirium to be between 17% and 44%.[5,8,11,12] Rates of delirium in hospitalized patients on the general pediatric floors using standardized screening tools have not yet been described in the literature.

The Cornell Assessment of Pediatric Delirium (CAPD) is a standardized and validated screening tool for children aged 0 to 21 years with approximately 94% sensitivity and 79% specificity.[8] It has been shown to work well in all delirium subtypes. In children with developmental delay, the specificity reduces to 51%, and sensitivity stays high at 96%. Scores of 9 and above indicate risk of developing delirium. It uses observational behavior that can be seen through normal hospital interactions with children and provides developmentally mapped behavior standards for younger children to help with the reliability of measurement. Studies using screening tools such as CAPD or Preschool Confusion Assessment Method for the Intensive Care Unit report a high variability of delirium, with incidence ranging from 17% to 44% in the PICU.[5,8,11,12]

Our study attempts to better clarify the incidence of delirium in non–intensive care inpatient pediatric units via retrospective medical record review of patients who screened positively for delirium based on the CAPD tool. We also sought to evaluate risk factors associated with the development of delirium in this population.

METHODS

Study Design and Population

We conducted a retrospective cohort study for all children between the ages of 0 and 21 years who were admitted to a 241-bed freestanding tertiary children's hospital with a range of medical and surgical subspecialties, PICU, and pediatric emergency department. The children underwent screening by nursing staff using the CAPD tool between September 2022 and January 2024. All children who underwent screening became part of a secure Excel database. We included children in our study with elevated CAPD scores of 9 or above. Children who had been transferred to or from the PICU were included if they had positive scores in the non-PICU setting. We excluded children with positive CAPD scores recorded solely in the PICU or during admissions to the epilepsy monitoring unit. We subsequently reviewed notes, vital signs, medication history, physical examination findings, and history of chronic illness from the electronic medical record for all children with positive CAPD. Children were defined as having chronic illness if they had 1 or more of the following diagnoses: chronic lung disease, tracheostomy dependence, ventilator dependence, G-tube dependence, epilepsy, global developmental delay, ventriculoperitoneal shunt, autism, or cerebral palsy. Data from medical record review were uploaded to REDCap and used for further analysis of this population. Approval for this study was granted by the hospital's institution review board.

Clinical Delirium and Risk Factors

The primary objective was to evaluate, through a retrospective review, the incidence of clinical delirium in the pediatric inpatient population who screened positively using the CAPD score. Clinical delirium was defined using the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) (DSM-5) criteria as "disturbance in attention and awareness or acute change in cognition that develops over a brief period (hours to days) and tends to fluctuate during the day. In addition, there must be evidence from the history, physical examination, and/or laboratory testing suggesting that the disturbance is caused by a medical disorder, a substance, or substance withdrawal."[2] Included medical records were identified based on a positive CAPD score because of its high sensitivity for delirium.[8] Reviewers consisted of 5 teams comprising 2 members each, including residents, medical students, a pediatric hospitalist fellow, or pediatric hospitalist attendings; junior team members were paired with senior members with more clinical experience. All team members were trained by the lead author in a standard review process on key clinical features to support or refute suspected delirium based on the DSM-5 criteria and available information in the electronic medical record. The research team reviewed patient medical records retrospectively to determine whether patients had either "suspected clinical delirium" (hereafter referred to as clinical delirium or delirium) or "unlikely clinical delirium" (hereafter referred to as no delirium).

Reviewers used information from patient medical records as outlined in the study design section to determine whether the child had altered mental status secondary to a known etiology, such as meningitis, encephalitis, traumatic brain injury, space-occupying lesions, seizure-related symptoms, psychiatric disorders, developmental delay, medication overdose, drug withdrawal, or pain, or if they had neuropsychiatric symptoms in addition to the abovementioned diagnoses that was better explained by delirium. Each patient medical record underwent review by a team of 2 reviewers, and their assessment of delirium was recorded to REDCap independently. A board-certified pediatric hospitalist with extensive clinical experience was designated to be the "third reviewer" and did not receive any initial patient assignments. If the delirium status differed

between the 2 reviewers on a team, the third reviewer then reviewed those patients and determined their delirium status. For children who had multiple inpatient encounters, we only recorded and reviewed positive CAPD scores from their first encounter.

Demographic and clinical variables, such as (1) the primary hospital problem, (2) chronic illness, (3) age groups (toddlers aged <4 years, school-aged children aged 5–12 years, teenagers aged >13 years), and (4) medications used to treat delirium, were compared between clinical delirium and no delirium groups. We examined potential risk factors for delirium such as sepsis, surgery, use of deliriogenic medications, sedation, anesthesia, comorbidities that affect delirium, medications used to treat delirium, and length of stay (LOS). High-risk medications for delirium, including medications with high risk of anticholinergic side effects (determined using the anticholinergic burden calculator [ACB] used in adults) and benzodiazepines, were selected based on review of prior literature.[12–15] These medications were recorded even if the child had been prescribed to take them at home (Supplemental Table 1).

Statistical Analysis

The main objective of the analysis was to calculate the incidence of clinical delirium. Clinical delirium was determined using the patient medical record review protocol. The incidence proportion of clinical delirium was calculated as the ratio of number of children who met the criteria for clinical delirium divided by the total number of children who screened positive using the CAPD tool and met the inclusion criteria. The distributions of the clinical risk factors were summarized according to the clinical delirium diagnosis status. Assumptions for normality were checked in all numeric data using the Shapiro-Wilk test. Continuous variables that were not normally distributed were summarized using median (25th percentile, 75th percentile) and analyzed using the Wilcoxon rank-sum test. Categorical data were summarized as count (%) and analyzed using chi-squared test or Fisher's exact test based on expected cell counts. A logistic regression model was used to examine associations between clinical delirium and potential risk factors, with odds ratios (ORs) representing the relative odds of a delirium diagnosis among patients exposed to the risk factor compared with those unexposed. The ORs represent the relative odds of being diagnosed with clinical delirium for patients exposed to the factor of interest compared with patients who were not exposed to the factor of interest. Factors that had extreme CIs due to small counts were reported as "NA." ORs and 95% CIs were represented on a forest plot to visualize the risk and precision of exposure to the risk factor and being diagnosed with clinical delirium. A *P* value of less than .05 was considered statistically significant using 2-sided tests unless otherwise specified. Variables that had a missing value were excluded from the specific analyses, and a change in sample size (N) was defined in the tables. All statistical analysis was calculated using SAS Enterprise Guide 7.1.

RESULTS

Of all the children hospitalized between September 2022 to January 2024, 7270 were screened using the CAPD tool. We noted that 750 children had positive CAPD scores in the PICU and/or nonintensive inpatient care setting. Of the 750 children, 505 were excluded for having positive scores exclusively in the PICU or epilepsy monitoring unit. Following a retrospective review of the 245 included medical records, 83 (33.9% of positive screens) children met criteria for clinical delirium (Figure 1).

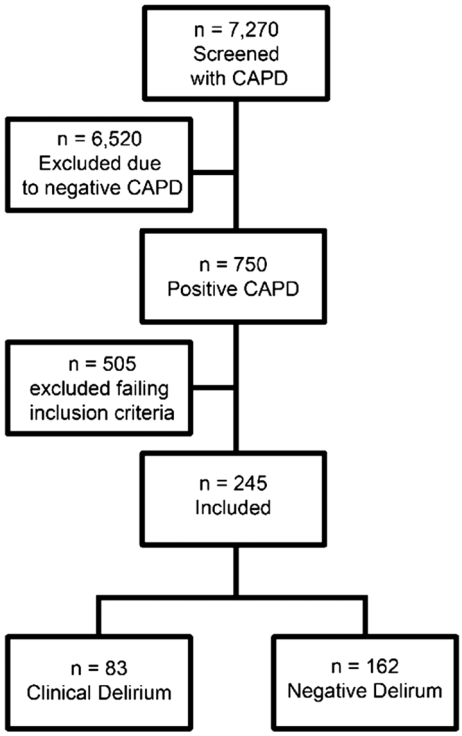

FIGURE 1. Consort diagram of patients included in the study. Patients (n = 505) who had a positive CAPD score solely in the pediatric intensive care unit or epilepsy monitoring unit were excluded.
Abbreviation: CAPD, Cornell Assessment of Pediatric Delirium.

Of the 245 patients, 85 (34.7%) had disparate clinical delirium diagnosis requiring a third reviewer. Only 15 of those 85 (17.8%) were ultimately diagnosed with clinical delirium and contributed to the total number of 83 patients with delirium. Children with chronic illness accounted for the majority (76%) of children requiring a third reviewer, with developmental delay (36.9%) being the most common chronic illness (Supplemental Table 2).

Demographics

The median age of children with clinical delirium was 9 years (IQR, 5–14), with the largest population being aged between 5 and 12 years (40%) (Table 1). There were no clinically significant differences among the children based on age, sex, race, ethnicity, weight, chronic illness, or body mass index in having delirium. Of the 83 children with clinical delirium, 72 (86.7%) did not have delirium listed as a diagnosis on their problem list during their admission. Thus, only 11 patients with clinical delirium had a noted diagnosis of delirium during their hospitalization.

TABLE 1. Patient Characteristics and Retrospective Diagnosis of Delirium

Demographics	Overall (n = 245)	No Delirium (n = 162)	Clinical Delirium (n = 83)	*P* Value
Age, y	8.0 [3.0–14.0]	7.5 [2.0–14.0]	9.0 [5.0–14.0]	.28
≤4	72 (29.3)	54 (33.3)	18 (21.7)	
5–12	92 (37.6)	52 (32.1)	40 (48.2)	
≥13	81 (33.1)	56 (34.6)	25 (30.1)	
Sex				.11
Female	106 (43.3)	76 (46.9)	30 (36.1)	
Male	139 (56.7)	86 (53.1)	53 (63.9)	
Race				.77
White/Caucasian	139 (56.7)	95 (58.6)	44 (53.0)	
Black/African American	33 (13.5)	23 (14.2)	10 (12.1)	
Asian	4 (1.6)	2 (1.2)	2 (2.4)	
Other	35 (14.3)	21 (13.0)	14 (16.9)	
Unknown	4 (13.9)	21 (13.0)	13 (15.7)	
Ethnicity				.20
Non-Hispanic	177 (72.2)	123 (75.9)	54 (65.1)	
Hispanic	40 (16.3)	23 (14.2)	17 (20.5)	
Unknown/refused	28 (11.4)	16 (9.9)	12 (14.5)	
Height, cm	n = 239 116.0 [91.0–148.0]	n = 159 115.0 [86.0–144.0]	n = 80 119.0 [99.1–151.0]	.12
Weight, kg	23.6 [13.0–42.9]	21.4 [11.8–39.0]	25.5 [15.1–45.6]	.14
BMI	n = 239 17.4 [15.2–20.7]	n = 159 17.0 [14.8–20.7]	n = 80 17.7 [15.4–20.5]	.44
Delirium in the problem list	n = 244	n = 161	n = 83	
Yes	12 (4.9)	0 (0)	11 (13.3)	
No	232 (95.1)	161 (100)	72 (86.8)	
Chronic illness	n = 244	n = 161	n = 83	.20
Yes	177 (72.5)	121 (75.2)	56 (67.5)	
No	67 (27.5)	40 (24.8)	27 (32.5)	

Abbreviation: BMI, body mass index.
Data are represented as median [25th-75th percentiles] or count (% cohort).

The most common primary hospital problem for both delirium and nondelirium subgroups was respiratory failure (30% overall). Also, the most common chronic illness for both subgroups was global developmental delay (53.7% overall). Epilepsy (17, 30.4%) and cerebral palsy (12, 21.4%) were significantly lower in the delirium population ($P = .01$ and $P = .02$, respectively) (Table 2).

Risk Factors Associated With Delirium

Children with LOS for more than 5 days were 1.9 times (95% CI, 1.11–3.26) more likely to develop delirium than children with LOS less than or equal to 5 days (Figure 2). Similarly, patients with clinical delirium had a significantly longer LOS than patients without clinical delirium (7.0 vs 4.0, $P = .002$) (Supplemental Table 3). There was also a higher proportion of patients with a diagnosis of sepsis who had delirium (21.7% vs 8.1%, $P = .003$) (Supplemental Table 3), with an OR of 3.15 (95% CI, 1.46–6.81) of developing delirium with a concurrent diagnosis of sepsis (Figure 2). There was no significant difference in delirium in children who received mild or moderate sedation, received anesthesia, underwent surgery, or received oxygen during the stay.

Exposure to Deliriogenic Medications and Medications Used for Treating Delirium

Patients who were administered hydroxyzine had 3.43 (95% CI, 1.08–10.9) higher odds of being diagnosed with clinical delirium compared with those who were not administered hydroxyzine. Higher ORs of clinical delirium were also present in patients treated with lorazepam, midazolam, and diphenhydramine (OR, 1.77 [95% CI, 1.01–3.11]; OR, 2.59 [95% CI, 1.47–4.56]; and OR, 3.40 [95% CI, 1.59–7.30], respectively) (Figure 2). Children with exposure to benzodiazepines and antihistamines with anticholinergic properties were more likely to meet criteria for delirium (Supplemental Table 4).

Of the 83 children with delirium, 17 (20.5%) had medications administered that are typically used as treatment of delirium, with

TABLE 2. Primary Hospital Problem and Presence of Chronic Illnesses				
	Overall (n = 245)	No Delirium (n = 162)	Clinical Delirium (n = 83)	*P* Value
Primary hospital problem, n (%)				
Altered mental status	7 (2.9)	5 (3.1)	2 (2.4)	1.00[a]
Ingestion	7 (2.9)	5 (3.1)	2 (2.4)	1.00[a]
Pneumonia	6 (2.5)	3 (1.9)	3 (3.6)	.41[a]
Respiratory failure/bronchiolitis	30 (12.2)	21 (13.0)	9 (10.8)	.63
Scoliosis	6 (2.5)	2 (1.2)	4 (4.8)	.18[a]
Seizures	21 (8.6)	16 (9.9)	5 (6.0)	.31
Sepsis or septic shock	6 (2.5)	2 (1.2)	4 (4.8)	.18[a]
Other	162 (66.1)	108 (66.7)	54 (65.1)	.80
Chronic illnesses[b], n (%)	n = 177	n = 121	n = 56	
Lung disease	30 (16.9)	24 (19.8)	6 (10.7)	.13
Tracheostomy dependence	24 (13.6)	16 (13.2)	8 (14.3)	.85
Ventilator dependence	8 (4.5)	5 (4.1)	3 (5.4)	.71[a]
G-tube dependence	79 (44.6)	54 (44.6)	25 (44.6)	1.00
Epilepsy	78 (44.1)	61 (50.4)	17 (30.4)	.01
Global development delay	95 (53.7)	65 (53.7)	30 (53.6)	.99
Ventriculoperitoneal shunt	17 (9.6)	12 (9.9)	5 (8.9)	.84
Autism	26 (14.7)	17 (14.0)	9 (16.1)	.72
Cerebral palsy	60 (33.9)	48 (39.7)	12 (21.4)	.02

Data are represented as number (% cohort).
[a] Fisher's exact test.
[b] Patients may have 1 or more chronic illnesses. One child removed because of missing chronic illness value and was classified as "No delirium."

melatonin being the most used medication (14.5%). The most used antipsychotic medication was olanzapine (8.4%). Only 4 of 17 (23.5%) had delirium mentioned as a diagnosis on the problem list (Table 3). These 4 patients were included in the 11 total patients who had a noted delirium within their hospitalization.

DISCUSSION

This is one of the first studies, to our knowledge, to describe the incidence of delirium among patients who screened positive for delirium in a non–intensive care inpatient pediatric setting. We also described risk factors that could contribute to delirium development in this population.

Of the children who screened positive using the CAPD tool in our study, 33.9% were noted to have clinical delirium, which is clinically significant, as it suggests that a substantial proportion of children with delirium may be underdiagnosed or undertreated. Delirium in the PICU has been studied extensively, with multiple known risk factors and complications.[3,5–14] Several of these risk factors overlap with children who are on the general pediatric floors—infection, exposure to deliriogenic medications, noise, disturbed sleep, discomfort, immobility, isolation, and overstimulation.[3] Yet, there is limited research on the occurrence of delirium in this population. Previous studies have reported lower rates of delirium than the PICU at 8% to 10%; however, they only analyzed patients with formal psychiatric consultations and looked at multiple care settings, including the PICU, subspecialty units, and general pediatric units.[7,10] We were able to screen patients using a validating screening tool that has been well established in the PICU[4–6,8,11] and capture a larger proportion of patients who may be at risk of delirium specifically on the general pediatric floors. We analyzed various risk factors noted in previous studies, including infection, exposure to deliriogenic pharmacological agents, and neurodevelopmental delay.[3,5,7]

Prior studies, such as Turkel and Tavare (2003), have noted infection to be one of the most common causes leading to pediatric delirium.[7] Our study specifically noted that sepsis was associated with increased odds of delirium. It was difficult to determine whether certain infections were more likely to lead to delirium or whether the children had already been treated for their sepsis at the time of identification of delirium. However, because we have robust criteria to identify children with sepsis and recognize the neurologic dysfunction that can accompany it, it may indicate that we noticed this correlation because of how efficient we have become at recognizing sepsis in our patients.[15] These patients represent a high-risk group that could be screened for delirium.

Exposure to benzodiazepines is an independent risk factor for delirium in the PICU.[5,12,13] Within our noncritical inpatient pediatric population, lorazepam and midazolam were significantly associated with delirium diagnosis in CAPD-positive children at 39% and 45%, respectively. Among the benzodiazepines, higher incidences were noted with lorazepam and midazolam compared with clonazepam

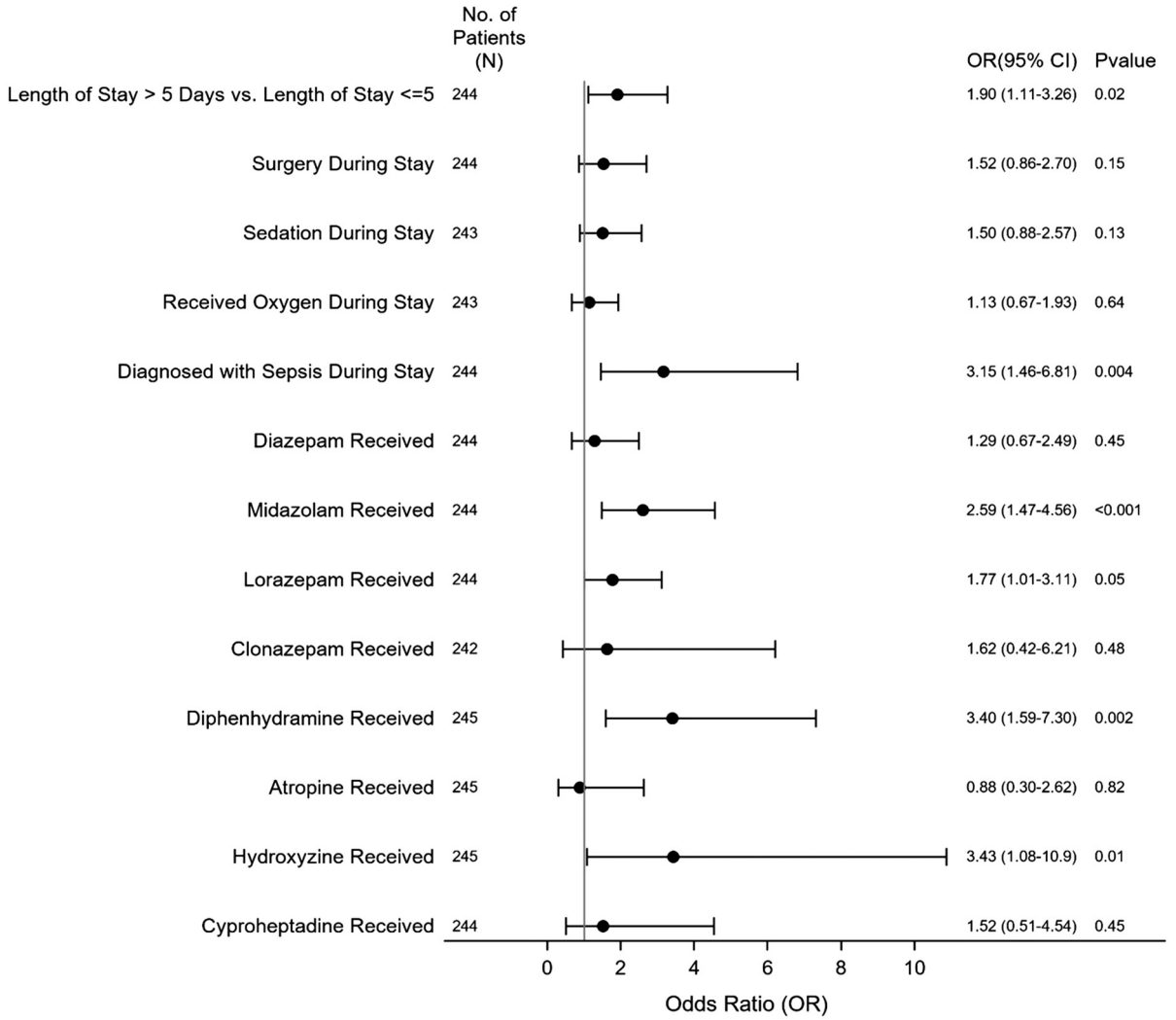

FIGURE 2. Clinical risk factors and medications associated with delirium. See Supplemental Figure 1 for additional medications associated with clinical delirium.
Abbreviation: OR, odds ratio.

TABLE 3. List of Patients Who Received Medications for the Treatment of Delirium and Had Delirium as a Diagnosis in the Problem List

	Clinical Delirium (n = 83)	Delirium in the Problem List (n = 11)
Medications administered, n (%)	17 (20.5)	4
Risperidone	4 (4.8)	2
Melatonin	12 (14.5)	3
Quetiapine	0 (0.0)	0
Olanzapine	7 (8.4)	2

Data are represented as count (% cohort). "Medications administered" represents the number of patients. More than 1 medication could have been administered to the same patient.

and diazepam, and a higher OR was noted exclusively with midazolam. This may be because midazolam is used more readily for sedation in our institution, while lorazepam, diazepam, or clonazepam is usually used for seizures.

Medications with anticholinergic properties have also been associated with being a risk factor for delirium.[5,14] To our knowledge, no studies have specifically addressed the effects of diphenhydramine administration and delirium in children except in the context of diphenhydramine toxicity.[16] Diphenhydramine has a high anticholinergic burden (Supplemental Table 1) and was more than 3 times more likely to be associated with delirium in our study. Notably, even though hydroxyzine is known to have a lower anticholinergic burden compared with other medications per the ACB calculator, it had the highest OR of clinical delirium in our population. This correlation with diphenhydramine and hydroxyzine may be because patients in our institution are often simultaneously administered multiple

medications with anticholinergic properties, thus increasing the risk of delirium, as is often the case for hospitalized patients.[14] Our study affirmed that the use of benzodiazepines and antihistamines with anticholinergic properties is associated with higher odds of clinical delirium even in the non-PICU setting. Children with frequent exposure to these deliriogenic medications could be targeted for screening for delirium.

Interestingly, only 4 of 17 (23.5%) children who received medications typically used for delirium had delirium mentioned as a diagnosis on the problem list. These medications have several different indications, including treatment of pediatric mental disorders, insomnia, and behavioral health emergencies; it is possible that these medications were administered for treating conditions other than delirium. This may be an area of further research to delineate whether children are being appropriately treated for delirium.

Through our study, we also noted that CAPD scores were frequently positive for children with developmental delay. This may reflect the variability in experience of general pediatric nurses using this tool for children with developmental delay and the low specificity of the tool in this population, leading to false-positive results.[8] These children were often found to have no delirium by the third reviewer, likely because of the deduction that their neurological baseline was congruent with certain aspects of the CAPD tool and not necessarily clinically relevant. Although our study did not show significant correlation with developmental delay and delirium, it is a known risk factor for delirium.[5,8] Similarly, we found that children with epilepsy or cerebral palsy had a lower incidence of having delirium, even though studies suggest that they may be at higher risk for delirium because these children often having concurrent developmental delay. This discrepancy may again be due to the difficulty providers face identifying the difference between an acute change in neurological baseline and existing neurological impairment or intellectual disability in this population.

Our study also showed significant differences in LOS in children affected by delirium. As seen with prior studies,[5,8] children with delirium were more likely to have increased LOS. Our risk analysis noted that children were nearly twice as likely to develop delirium if the LOS was more than 5 days. This indicates that children with prolonged hospitalizations could also be targeted for routine delirium screening.

This study has several limitations. Most notably, this is a single-center retrospective study leading to a smaller study sample that limits the power to detect the impact of specific risk factors or medications. Additionally, the retrospective nature limits the ability to diagnose delirium most accurately because the clinical standard is a full psychiatric assessment during the acute episode of delirium. We attempted to control this with 2 reviewer teams and the third reviewer when necessary. However, this retrospective analysis does introduce the potential for reviewer bias. Similarly, the experience of general pediatric nurses in using the CAPD tool may vary and could have lowered interrater reliability. Furthermore, we reviewed only CAPD-positive patients for delirium; there still may remain an undetected delirium population of patients who are CAPD negative or with delirium who were not screened. We were also limited by information in patient medical records, as it may not have always accounted for crucial clinical data, such as caregiver history or provider familiarity, with patients who are medically complex to help guide delirium status. We also did not address whether environmental interventions such as maintaining day/night cycles with artificial light and sunlight, noise reduction, sleep hygiene, and reduction of stimulation such as measuring vital signs could have impacted improvement in delirium status, as these are not well documented within our electronic medical record. Moreover, the timing of medications received was not reported, limiting the ability to describe their relation to the development of delirium. Finally, we did not identify whether the medications described to treat delirium were used for this purpose or whether they may have been used for other indications, such as behavioral interventions or insomnia.

CONCLUSION

A third of the children on the general pediatric floors with positive CAPD scores were found to have delirium retrospectively. Few were treated for delirium. Routine screening among patients who have risk factors for delirium may help to recognize and treat delirium early or address contributing factors that could lead to similar symptoms. Multicenter studies are needed to establish rates of inpatient pediatric delirium nationally and further delineate risk factors that could be contributing to this condition. Specific studies are also needed to help distinguish delirium occurring in children with developmental delay.

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ABBREVIATIONS

ACB: anticholinergic burden
BMI: body mass index
CAPD: Cornell Assessment of Pediatric Delirium
DSM-5: *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition)
ICU: intensive care unit
LOS: length of stay
OR: odds ratio
PICU: pediatric ICU

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