

## ORIGINAL ARTICLE

# DELIRIUM ON ADMISSION: PATTERNS IN A MEDICINE UNIT OF A TERTIARY CARE HOSPITAL IN BANGLADESH

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### Abstract:

*Background:* Delirium, a complex neuropsychiatric syndrome, poses challenges in clinical settings due to its varied aetiology and under diagnosis. This study aimed to explore the prevalence, demographic characteristics, and contributing factors of delirium as a presenting feature in the population admitted to a tertiary care hospital in Bangladesh. Limited studies on delirium in low- and middle-income countries necessitate a comprehensive investigation to inform healthcare practices in diverse settings. *Methods:* A prospective observational study was conducted on 102 patients diagnosed with delirium among a total of 2599 patients admitted to the medicine unit over six months. Delirium was assessed using the Confusion Assessment Method (CAM) score, with demographic variables and comorbidities analyzed. *Results:* The study identified a delirium prevalence of 3.8%, with stroke and poisoning as major contributors. Females (56.8%), individuals above 50 years (69.8%), and those with comorbidities (67.6%) exhibited higher susceptibility to delirium. The multifactorial aetiology included stroke (49.3%), poisoning (1.42%), electrolyte imbalance (0.76%), and others. Sedative poisoning predominated (45.9%) among poisoning cases. *Conclusion:* This study highlights the demographic and etiological dimensions of delirium. The significant impact of stroke, the underexplored realm of poisoning-related delirium, and the influence of age and comorbidities underscore the need for targeted interventions and increased awareness.

**Keywords:** Delirium, prevalence, demographic characteristics, contributing factors, tertiary care hospital, Bangladesh.

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### Introduction:

Delirium is a complex neuropsychiatric syndrome and often considered the most common one in a medical setting<sup>1</sup>. Delirium constitutes a grave alteration in cognitive function that extends beyond the typical

oscillations in attention and alertness. It is characterized by altered consciousness, cognitive impairment, and inattention fluctuating over time and have an abrupt onset as a defining feature<sup>2</sup>. This condition is not an isolated entity but rather a symptom

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of an underlying medical issue or external precipitating factor. These can range from infections, such as RTI or UTI to metabolic disorders like electrolyte imbalances, liver or kidney failure. Adverse reactions to medications, abrupt substance withdrawal, and traumatic insults to the brain, whether through injury or surgery, are also common instigators.

Although frequently encountered, delirium is still not well established in terms of its etiology and remains under diagnosed. It is often recognized as a geriatric disease as certain populations, notably older adults (those aged 65 and older) are particularly susceptible to delirium<sup>3</sup>. Moreover, regardless of age, past cognitive ability, or comorbidities, it is associated with adverse outcomes like longer hospital stays, higher mortality rate and increased healthcare costs<sup>4</sup>. It is reported in one study that for every additional 48 hours of active delirium, mortality increases by 11%, emphasizing the need for prompt diagnosis and intervention<sup>5</sup>. According to a different study, people who have delirium lose an average of 13% of a year of life and have a 62% increased risk of mortality<sup>6</sup>

Though a number of studies have been found measuring the prevalence and incidence rates of delirium in hospitalized patients in medical wards, there were discrepancies in the findings. As it is difficult to conduct clinical trials and systemic studies, getting the right results is often challenging<sup>7</sup>. The prevalence of delirium in the general population is estimated to be 0.4% worldwide, increasing to 1% in the population above 55 years of age by Soenke et al<sup>8</sup>.

Despite its high prevalence, delirium often remains inadequately managed during patient admission in a hospital<sup>9</sup>. We have found no research that investigated the presence of delirium in the whole adult population of a hospital, especially in any of the low-and-middle-income countries. The limited study that is conducted on delirium solely comprises of the findings from the intensive care units and after surgeries.

Our study aims to shed light to this issue by investigating the extant of delirium on patient admission in the medicine unit at a tertiary care hospital. The Confusion Assessment Method (CAM) score is used for diagnosis and assessment of delirium<sup>10</sup>. Employed during clinical examinations, a CAM score exceeding 3 confirmed the presence of delirium in eligible patients, ensuring a standardized and objective evaluation. Studying delirium as a presenting feature in a country like Bangladesh is

crucial for optimizing healthcare resource allocation and improving patient outcomes. Understanding the nuances of delirium during patient admission is imperative for tailoring effective diagnostic and intervention strategies, ultimately contributing to healthcare system efficiency.

### **Methods:**

Study design and sample size:

This prospective observational study was conducted in the indoor unit of the medicine department at Sir Salimullah Medical College Mitford Hospital, Dhaka. The study was conducted over a period of six months, from January to June 2022. A total of 2599 patients who were admitted within the time frame were assessed and 102 patients with delirium were included in the study.

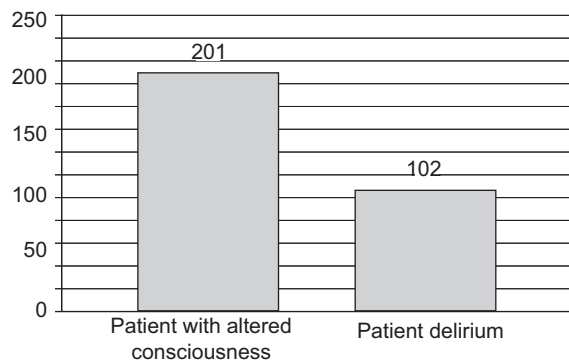
### **Data Collection:**

Data was collected from the patients with the informed consent from their attendants. Necessary permission from the authorities concerned was taken to review the medical files of the patients. Patients were assessed according to the CAM score. The Inclusion criteria constituted of patients aging 14 and above, admitted to the medicine unit of the tertiary care hospital during the specified time frame of our study, presence of delirium as a primary presenting feature upon admission, confirmed through clinical examination. The patients aged below 13 years, patients with pre-existing severe cognitive impairment (e.g., dementia), patients admitted for psychiatric reasons with delirium as a secondary feature and the patients or attendants who refused to participate or provide informed consent were excluded from the study. Stroke was excluded by CT or MRI.

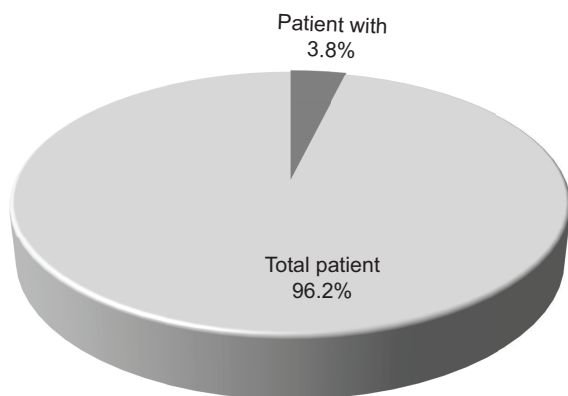
### **Data Analysis:**

The study employed a prospective observational design wherein data pertaining to delirium as a presenting pattern were meticulously collected, stratified based on age, sex, and underlying causes. The data set was systematically entered into Microsoft Excel for subsequent analysis. Utilizing SPSS version 24, the acquired data were subjected to statistical examination, with results articulated in terms of percentages and proportions. This methodological approach facilitated a comprehensive exploration of the demographic and etiological dimensions of delirium, offering valuable insights into its distribution within the studied population.

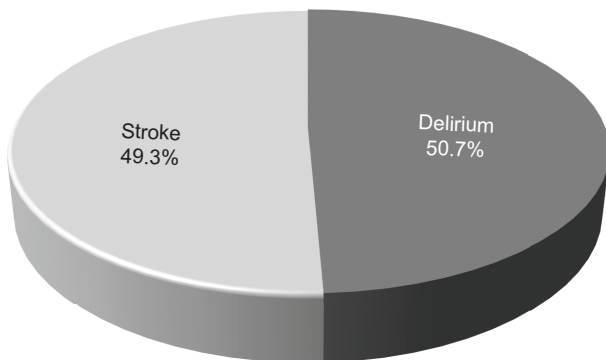
**Results:**



**Fig 1:** A total number of 2599 patients were assessed as the sample of our study with 201 patients having altered level of consciousness as a presenting feature during admission. Among them, 102 patients were found fitting the criteria of delirium according to CAM score.



**Fig-2:** Among 201 patients with altered consciousness, 102 patients were diagnosed with delirium according to CAM score, which consisted of 3.8% of the total admitted patients.

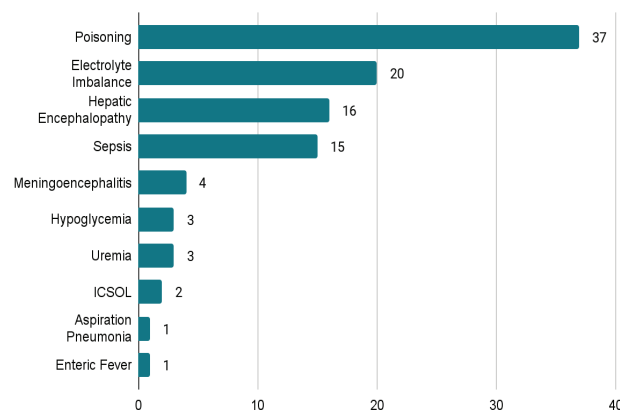


**Fig-3:** Causes of altered level of consciousness consisted of stroke as a major cause for 99 patients (49.3%) and delirium for 102 patients (50.7%).

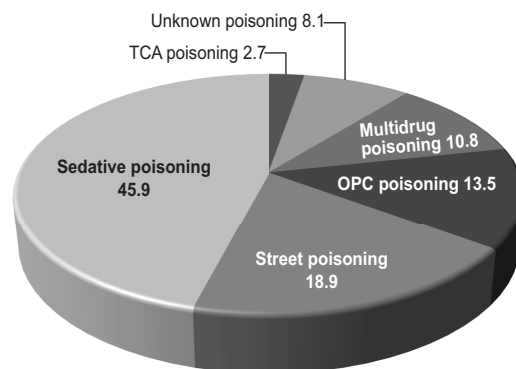
**Table I**

*Demographic variables of the patients presented with delirium as a presenting feature during hospital admission.*

Variable	Category	Number	Percentage
Gender	Male	44	43.1%
	Female	58	56.8%
Age	≤50 years	41	40.2%
	>50 years	61	59.8%
Co-morbidities	Co-morbidities	69	67.6%
	No co-morbidities	33	32.4%



**Fig-4:** Etiology of delirium is described with poisoning (36.3%) as the leading cause with a maximum number of patients, followed by electrolyte imbalance (19.6%), hepatic encephalopathy (15.7%), sepsis (14.7%), meningo-encephalitis (3.9%), hypoglycemia (2.9%), uremia (2.9%) and ICSOL (2%).



**Fig 5:** Causes of poisoning are shown with sedative poisoning as a leading cause (45.9%) of all types of poisoning, followed by street poisoning (18.9%), OPC (13.5%), multidrug (10.8%), unknown poisoning (8.1%) and TCA (2.7%).

**Discussion:**

In our comprehensive study aimed at exploring statistical disparities in delirium as a presenting feature during admission to a medical unit, we first delved into the prevalence of delirium during patient admission. The prevalence of delirium exhibits variability among diverse populations, with recent research indicating incidence rates ranging from 10% to 60% in hospitalized patients<sup>11,17</sup>. According to another systematic research, the prevalence of delirium in acute hospitals ranged from 11 to 42%<sup>3</sup>. While our observed prevalence (3.8%) may appear lower in comparison, it is crucial to consider the unique characteristics and demographic composition of our study population, as well as potential variations in healthcare settings.

Demographic variables, specifically gender, age, and the presence of comorbidities, were systematically examined in our study. Our findings indicated a higher incidence of delirium among females compared to males (56.8% vs. 43.1%), with approximately 69.8% of affected individuals being aged over 50 years. This gender-related study findings aligns with previous observations of a separate study where the majority of delirium cases were also reported among females (57.29%)<sup>12</sup>.

Advanced age emerged as a significant correlate of delirium, with individuals older than 50 years demonstrating a heightened susceptibility compared to their younger counterparts<sup>8</sup>. Our finding was supported by evidence from studies from Ethiopia<sup>13</sup>, Ireland<sup>14</sup> and India<sup>15</sup>.

Multiple studies have consistently highlighted the correlation between delirium prevalence and the presence of comorbid conditions<sup>16,17</sup>. Our study reinforces this trend, revealing that a substantial 67.6% of patients diagnosed with delirium in our study exhibited concurrent comorbidities. This underscores the pervasive influence of comorbidities on the manifestation of delirium in our patient population.

Our study identified stroke and delirium as the primary contributors to altered consciousness, revealing a substantial prevalence of 49.3% attributed to stroke. This finding diverges from a previous systematic analysis in 2019, reporting a comparatively lower prevalence of altered consciousness in acute stroke conditions at 25%<sup>18</sup>. This highlights the importance of considering the specific context and characteristics of the studied population when interpreting and comparing prevalence rates, highlighting the potential impact of population demographics on study outcomes.

The multifactorial etiology of altered consciousness encompasses a broad spectrum, including hypoglycemia, toxic ingestion, trauma, seizures, infections, metabolic disturbances, electrolyte disorders, encephalopathy, overdose, intoxication, uremia, stroke, and hypo-hyperglycemia<sup>19,20,21</sup>. Our findings align comprehensively with this diverse range, revealing stroke as the predominant cause (3.8%), followed by poisoning (1.42%), electrolyte imbalance (0.76%), hepatic encephalopathy (0.61%), sepsis (0.57%), meningoenephalitis (0.15%), hypoglycemia (0.11%), uremia (0.11%), ICSOL (0.07%), aspiration pneumonia (0.038%), and enteric fever (0.038%). Sepsis and metabolic abnormalities were identified to be the most common causes of delirium in hospital patients in medical wards by Khurana et al, which also supported our findings<sup>22</sup>. Our detailed breakdown emphasizes the nuanced landscape of causes contributing to altered consciousness in our patient population.

The scarcity of existing literature on the types of poisoning causing delirium in patients emphasizes the novelty of our study's exploration into this critical domain. Though few studies have been conducted on delirium caused by drug induced toxicity<sup>23</sup>, substance abuse<sup>24</sup> and anticholinergic poisoning<sup>25</sup>, this side is still greatly unexplored. Our findings illuminate a complex landscape of poisoning etiology, with sedative poisoning emerging as the predominant cause, constituting 45.9% of all poisoning cases. Street poisoning follows at 18.9%, while other significant contributors include organophosphorus compound (OPC) poisoning at 13.5%, multidrug poisoning at 10.8%, unknown poisoning at 8.1%, and tricyclic antidepressant (TCA) poisoning at 2.7%. This information not only contributes substantially to the area of poisoning-related delirium but also emphasizes the diverse array of toxicological agents influencing altered mental status in the hospitalization of our patients.

**Conclusion:**

In conclusion, our study provides valuable insights into the demographic, etiological, and clinical dimensions of delirium in a tertiary care hospital in Bangladesh. The significant impact of stroke, the underexplored realm of poisoning-related delirium, and the influence of age and comorbidities underscore the need for targeted interventions, increased awareness, and comprehensive patient management strategies.

**Limitations of the Study:**

The single hospital-based study did not reflect the exact scenario of the whole community. Patients from all

socioeconomic statuses and all parts of the country did not come to seek medical attention in the study place.

#### Data Availability:

The datasets analysed during the current study are not publicly available due to the continuation of analyses but are available from the corresponding author on reasonable request.

#### Conflict of Interest:

The authors stated that there is no conflict of interest in this study

#### Funding:

This research received no external funding.

#### Ethical consideration:

The study was conducted after approval from the ethical review committee of Sir Salimullah Medical College. The confidentiality and anonymity of the study participants were maintained.

#### Acknowledgments:

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