MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2024.7.18.700.707

Risk Factor, Motor Subtypes and Outcome of Delirium: A Follow up Study from a Tertiary Care Hospital

[1]Debjit Misra, [2]Divya Gopal Mukherjee and [3]Priyam Bhunia

[1]Department of Psychiatry, Rampurhat Government Medical College and Hospital, Rampurhat, Birbhum, India

[2]Department of Psychiatry, Burdwan Medical College and Hospital, Purba Bardhaman, India

[3]Department of Psychiatry, Tamralipto Government Medical College and Hospital, Tamluk, Purba Midnapore, India

ABSTRACT

Delirium is the impairment of consciousness and attention as well as global disturbance of cognition. The onset of delirium is usually rapid and the course of illness fluctuates diurnally. The duration is usually less than four weeks but in some occasion, it may last upto 6 months. It may be associated with psychomotor disturbances, disturbance of sleep-wake cycle and emotional disturbances. Elderly age group, cognitive impairment and presence of other comorbidity are the most important risk factors. Patients who are suffering from delirium, have increased risk of death, cognitive impairment and longer hospital stay. To assess sociodemographic profile, risk factors, motor subtypes and outcome of delirium. An Observational study was conducted in referral patients from the various medical and surgical wards of Burdwan Medical College and Hospital, Purba Bardhaman. This period of study was 1.5 years including data collection, processing, analysis and preparation of draft. 100 patients were included in this study based on inclusion criteria. Majority of patients (43%) were between the age group 51 to 60 years and 36% were above the age group 61 to 65 years. Majority of the patients were Male, Muslim, married, unemployed, from lower socio-economic rural joint family background and majority of them were educated up to high school. Most referrals were come from medical ward (50%) and CCU (29%). Major motor subtypes of delirium are hypoactive, followed by hyperactive followed by mixed type. Patients of hyperactive subtype of delirium had recovered more, while mixed subtype of delirium has more chances of not recovering from delirium. Mortality was seen to be significantly higher (34.4%) in CVA than other risk factors. Mortality was also lesser if admission-referral interval is lesser. Mortality is highest (63.2%) in hypoactive motor subtype and is lowest (50%) in hyperactive motor subtype. In all hospitalized patients specially in elderly population strict monitoring of symptoms is recommended for early diagnosis of delirium. Early Psychiatric consultation is advised for better treatment approach. Proper psychoeducation to the nursing staffs, other ward attendants and care givers should be done. So that any subtypes of delirium could not be overlooked.

OPEN ACCESS

Key Words
Delirium, subtypes, tertiary care, hospital

Corresponding Author
Debjit Misra,
Department of Psychiatry, Rampurhat Govt. Medical College and Hospital, Rampurhat, Birbhum, West Bengal 731224, India
drdm.rgkmch@gmail.com

Author Designation
[1,3]Senior Resident
[2]Professor and Head

Received: 24 August 2024
Accepted: 18 September 2024
Published: 23 September 2024

Citation: Debjit Misra, Divya Gopal Mukherjee and Priyam Bhunia, 2024. Risk Factor, Motor Subtypes and Outcome of Delirium: a Follow up Study from a Tertiary Care Hospital. Res. J. Med. Sci., 18: 700-707, doi: 10.59218/makrjms.2024.7.18.700.707

Copy Right: MAK HILL Publications

INTRODUCTION

The term "Delirium" was first used by the formal medical context by Celsus in the first century AD. He used the term to explain a wide variety of mental disorder including phrenitis, lethargus, hysteria, melancholia and mania. The earliest known references to delirium in medical literature are found in "Books of Epidemics" written by Hippocrates on some 2400 years ago[1]. Delirium is the impairment of consciousness and attention as well as global disturbance of cognition. The onset of delirium is usually rapid and the course of illness fluctuates diurnally. The duration is usually less than four weeks but in some occasion, it may last upto 6 months. It may be associated with psychomotor disturbances, disturbance of sleep-wake cycle and emotional disturbances. Elderly age group, cognitive impairment and presence of other comorbidity are the most important risk factors. Patients who are suffering from delirium, have increased risk of death, cognitive impairment and longer hospital stay. Delirium has large amount of medical, societal and economic burdens on the entire health care system[1]. The American Psychiatric Association's first attempts to clarify the concept of delirium in the third edition of the DSM-III. The tenth edition of the ICD classification of delirium (F05) now has many similarities with DSM-5. The ICD-11 also mentioned delirium under 6D70 coding. Delirious patients can present with manic-like symptoms (poor sleep, pressured speech, high energy, agitation), depression-like symptoms (withdrawn, isolative, poor motivation, low energy), anxiety-like symptoms (anxious, poor sleep, restlessness, agitation), sleep disorder-like symptoms (reversed sleep-wake cycle, insomnia, hypersomnolence) and schizophrenic-like symptoms (hallucinations, delusions, paranoia, thought disturbances). As a result, delirium may be overlooked in early phase of illness, until severe deterioration. In some occasion, the symptoms of delirium are superimposed with other neurocognitive disorders like dementia, from which differentiation could be difficult. A cardinal feature of delirium is reduced alertness, manifested by difficulty maintaining attention and focusing concentration. The delirious patient cannot ignore irrelevant or minor stimuli and as a result they are easily distractable. Due to faulty attention, the patients find difficulty in registering new information. So immediate and recent memory are usually disturbed grossly, though remote memory may remain intact. Higher cognitive functions like planning, problem solving attitude and executive functions are reduced. These disturbances often increase towards evening, which is characteristically known as sundowning phenomenon. Typically, sleep becomes brief and fragmented and fatigue tends to aggravate the symptoms of delirium. Subjects often demonstrate a reversal of sleep patterns, with daytime napping and nocturnal wakefulness. Usually, delirium is classified on the basis of the level of psychomotor activity. But the aetiologies of delirium could not predict the symptomatology and motor subtype of delirium. The hyperactive (increased psychomotor activity) type of delirium usually came to medical attention earlier due to disruptive behaviour[1].

Usually visual hallucination occurs most commonly but auditory, gustatory and olfactory may also occur though occur rarely. Delusions are often paranoid or persecutory (e.g., suspicion of poisoned food or fear of intended harm by nursing staff). The risk of delirium is determined by predisposing risk factors (that is, the background characteristics of patients) and precipitating risk factors (that is, acute insults, injury or drugs). Predisposing risk factors for delirium include increased age, cognitive impairment (such as dementia or developmental delay, frailty, comorbidities (including cardiovascular and renal disease), depression or other psychiatric illness alcohol use, poor nutritional status and visual and hearing impairment[2-10].

Early recognition of symptoms and early intervention with proper liaison with psychiatrist would prevent the fatality of delirium. Other interventions like proper care on nutrition, maintain hydration status, monitoring of metabolic parameter and attention to visual and hearing impairment might decrease the severity of symptoms and would prevent longer hospital stay. In some study, it was found that use of anti-psychotic specially low dose of haloperidol acted as protective factor, though there are controversaries regarding this[1].

De Rooij and van Munster[11], proposed the disturbance of circadian rhythm and sundowning phenomenon occurred in delirium and melatonin deficiency could be an important factor in occurrence of delirium. The usage of melatonin has a protective role in preventing the symptoms of sundowning phenomenon[12]. Melatonin is implicated in the modulation of inflammation in the brain and there are associations between sleep dysregulation and decreased proportions of natural killer cells, reduced lymphokine-activated killer activity and reduced IL-2 production[13].

Each and every elderly patient who are hospitalized for long time should undergo with some rating scales like MMSE, Delirium Rating Scale (DRS) and Confusion Assessment Method (CAM) for early diagnosis and early intervention of delirium.

Once a patient is recognized with delirium, it is first important to identify acute and life-threatening causal factors, including hypotension, low tissue oxygenation, drug overdose or withdrawal and hypoglycaemia. Once life-threatening conditions have

been corrected, the second step is the identification of the underlying causes of delirium. The third step is the adoption of nonpharmacological treatments. Unnecessary tubes, catheters and physical restraints should be avoided. Unfamiliar environment, excessive noise and ward moves may indeed be precipitating factors of delirium. It is also important to actively involve family members in care to improve mobility and participation[14].

Aim: To assess risk factors, motor subtypes and outcome of delirium.

Objective:

- To estimate the socio-demographic and clinical profile of patient of delirium
- To estimate the risk factors of delirium
- To estimate the distribution of motor subtypes among the patients of delirium
- To estimate the outcome of delirium
- To determine the relation between socio-demographic profile, clinical profile, risk factors, motor subtypes and outcome of delirium

MATERIALS AND METHODS

Study area: Various medical and surgical wards of Burdwan Medical College and Hospital, Purba Bardhaman.

Study population: Patients who will be admitted in various medical and surgical ward of Burdwan Medical College and Hospital and will be referred for psychiatric evaluation, during the study period will be the study population.

Study period: 1.5 years including data collection, processing, analysis and preparation of draft of the thesis.

Study design: Follow up, observational study.

Sample size design: In one study of Berman[15] from North India conducted by Sandeep Grover among all inpatients the prevalence of delirium was found to be ranged from 0.28 to 0.53% with mean prevalence rate was reported to be 0.44%.

Required sample size for the current study is estimated to be 94 which is derived from the following equation.

$$\text{Sample size} = \frac{z^2 p(1-p)}{l^2}$$

where, z score = 1.96 (considering 95% as confidence limit and 0.1 as confidence interval), p = prevalence rate (e.g. 0.44%), l = allowable error (1%)].

But we will consider sample size for this study to be 100 (tentatively) to reduce the margin of error.

Inclusion criteria:

- Psychiatric referred patients admitted in various medical and surgical wards of Burdwan Medical College and Hospital
- Age group between 18-65
- Patients fulfilling the criteria of delirium (code 6D 70 according to ICD-11, DCR Version)
- Admitted with at least one family member or caregiver present with the patient
- Giving informed consent. (if patient cannot give consent, it will be taken from informant)

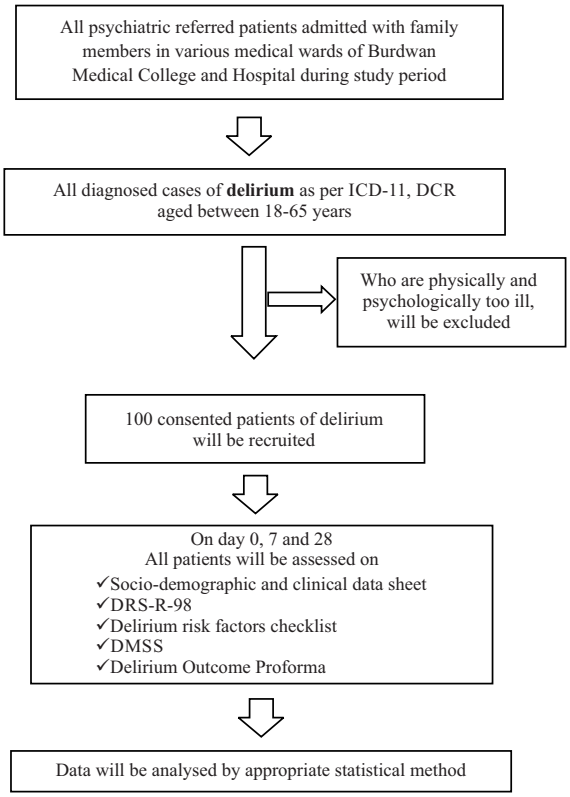
Exclusion criteria:

- Physically and psychologically too ill to fit for participation in the study
- Not giving informed consent
- According to ICD 11 DCR version specific substance induced delirium (alcohol, cannabis, synthetic cannabinoid, opioid, sedative, hypnotic, anxiolytic, cocaine, stimulants, synthetic cathinone, hallucinogen, volatile inhalant, MDMA, ketamine or PCP, specified or unspecified or multiple specified psychoactive substances)

Study tools and variables:

- International Classification of Diseases, Eleventh Edition, Diagnostic Criteria for Research Version (ICD- 11, DCR), (Appendix 1)[12]
- Socio-demographic, psychiatric history record and clinical data sheet (Appendix 2A, 2B, 2C):
- Delirium Risk Factor Checklist (Appendix 3):
- Delirium Rating Scale, Revised version (DRS-R-98) (Appendix 4)[12]:
- Delirium Motor Subtype Scale (DMSS) (66) (Appendix 5): It is an 11-item scale used to classify delirium into several motoric subtypes. Four symptoms are from Hyperactive and rest seven are from Hypoactive delirium. Each item is rated as “absent” (score = 0) or “present” (score = 1). The hyperactive subtype is assigned if the patient shows at least two of the hyperactive symptoms over the previous 24 hrs. The hypoactive subtype is assigned if the patient shows at least two of the Hypoactive symptoms over the previous 24 hrs. The mixed subtype is assigned if the patient shows both hyperactive and hypoactive symptoms. No subtype is assigned if there is no evidence of either the hyperactive or hypoactive subtype
- Delirium Outcome Proforma (Appendix 6): It is a self-structured scale designed for the current study to outcome of delirium.

Study procedure:



Statistical analysis plan: Descriptive analysis will be computed in terms of Mean and standard deviation with range for continuous variable and frequency and percentage for categorical variables.

Chi-square test for non-parametric variables and unpaired t test and analysis of variance (ANOVA) for parametric variables will be used to compare various socio-demographic, clinical variables.

Correlation between various socio-demographic, clinical variables will be examined by using Pearson's product number (for parametric variable) and Spearman's rank order correlations (for parametric variables).

Multivariate (regression) analysis will be run to study the effect of various ind ependent variables on the dependent variable (where applicable).

Data analysis will be done by using statistical software SPSS 20.0 version.

RESULT AND ANALYSIS

Majority of patients (43%) were between the age group 51 to 60 years and 36% were above the age group 61 to 65 years (Table 1).

Majority of the patients were Male, Muslim, married, unemployed, from lower socio-economic rural joint family background and majority of them were educated up to high school.

Table 1: Distribution of age in group

Age In group	Frequency	Percent
21-30	4	4.0
31-40	8	8.0
41-50	9	9.0
51-60	43	43.0
≥61	36	36.0
Total	100	100.0

Females are larger proportion of risk factors like meningitis, pneumonia, post operative cases of major surgery and dyselectrolytemia, while male has larger proportion of risk factors like cerebrovascular accident, metabolic encephalopathy and head injury (Table 2).

There was a significant difference between the 13 groups in terms of Age (χ^2 = 53.244, p = <0.001), with the mean Age being higher in the Risk Factors for Delirium: Septicaemia, hypoglycaemia, dyselectrolytemia, Meningitis, Neck femur fracture (post-surgical), pneumonia and Ureamic encephalopathy and cerebrovascular accident group.

Patients of hyperactive subtype of delirium had recovered more, while mixed subtype of delirium has more chances of not recovering from delirium. Participants who were died within four weeks had the larger proportion of hypoactive subtype of delirium. Participants who were alive at the end of four weeks had the larger proportion of hyperactive type of delirium.

Mean Delirium Rating Scale-Revised 98 at the first day of interview (24.70 days) and at the end of four weeks (9.33 days) are higher in those patients who did not recover from delirium (Table 3).

In those patients who recovered from delirium, majority of them regained (60.3%) regained functionality fully at the end of four weeks. Mortality was seen to be significantly higher (34.4%) in CVA than other risk factors. Mortality was also lesser if admission-referral interval is lesser that if patient has been referred earlier, there have been less mortality. Mortality is highest (63.2%) in hypoactive motor subtype and is lowest (50%) in hyperactive motor subtype (Table 4).

In those patients who recovered from delirium, majority of them regained (60.3%) regained functionality fully at the end of four weeks. Mortality was seen to be significantly higher (34.4%) in CVA than other risk factors. Mortality was also lesser if admission-referral interval is lesser that if patient has been referred earlier, there have been less mortality. Mortality is highest (63.2%) in hypoactive motor subtype and is lowest (50%) in hyperactive motor subtype (Table 5).

39.7% of the participants who were recovered from delirium had impaired their functionality partially at the end of four weeks. 60.3% of the participants who were recovered from delirium had regained their

Table 2: Association between gender and risk factors for delirium (n = 100)

	Gender			Chi-squared test	
Risk factors for delirium	Male	Female	Total	χ^2	p-value
Meningitis	10 (15.4%)	7 (20.0%)	17 (17.0%)	34.341	<0.001
CVA	14 (21.5%)	1 (2.9%)	15 (15.0%)		
Neck femur fracture (post-surgical)	3 (4.6%)	6 (17.1%)	9 (9.0%)		
Pneumonia	5 (7.7%)	4 (11.4%)	9 (9.0%)		
Cardiogenic shock	8 (12.3%)	0 (0.0%)	8 (8.0%)		
Dyselectrolytemia	3 (4.6%)	4 (11.4%)	7 (7.0%)		
Eclampsia	0 (0.0%)	6 (17.1%)	6 (6.0%)		
Head injury	6 (9.2%)	0 (0.0%)	6 (6.0%)		
Hepatic encephalopathy	4 (6.2%)	1 (2.9%)	5 (5.0%)		
Hypoglycaemia	3 (4.6%)	2 (5.7%)	5 (5.0%)		
Septicaemia	4 (6.2%)	0 (0.0%)	4 (4.0%)		
Ureamic encephalopathy	3 (4.6%)	1 (2.9%)	4 (4.0%)		
Choledocholithiasis (post-surgical)	2 (3.1%)	3 (8.6%)	5 (5.0%)		
Total	65 (100.0%)	35 (100.0%)	100 (100.0%)		

Table 3: Association between mortality and delirium motor subtype (n = 100)

	Mortality			Chi-Squared Test	
Delirium motor subtype	Yes	No	Total	χ^2	p-value
Hypoactive	43 (63.2%)	6 (18.8%)	49 (49.0%)	17.246	<0.001
Hyperactive	15 (22.1%)	16 (50.0%)	31 (31.0%)		
Mixed	10 (14.7%)	10 (31.2%)	20 (20.0%)		
Total	68 (100.0%)	32 (100.0%)	100 (100.0%)		

Table 4: Association between delirium motor subtype and recovered from delirium (n = 100)

	Delirium motor subtype				Chi-squared test	
Recovered from delirium	Hypoactive	Hyperactive	Mixed	Total	χ2	p-value
Yes	39 (79.6%)	26 (83.9%)	8 (40.0%)	73 (73.0%)	13.989	<0.001
No	10 (20.4%)	5 (16.1%)	12 (60.0%)	27 (27.0%)		
Total	49 (100.0%)	31 (100.0%)	20 (100.0%)	100 (100.0%)		

Table 5: Comparison of the 2 subgroups of the variable recovered from delirium in terms of delirium rating scale (day 0) (n = 100)

	Recovered from Delirium		Wilcoxon-Mann-Whitney U Test	
Delirium rating scale (day 0)	Yes	No	W	p-value
Mean (SD)	22.99 (1.65)	24.70 (0.95)	321.000	<0.001
Median (IQR)	23 (22-24)	24 (24-26)		
Min-Max	20 – 27	23 - 26		

Table 6: Comparison of the 2 subgroups of the variable recovered from delirium in terms of delirium rating scale (day 28) (n = 79)

	Recovered from delirium		Wilcoxon-Mann-Whitney U test	
Delirium rating scale (Day 28)	Yes	No	W	p-value
Mean (SD)	3.04 (1.49)	9.33 (0.52)	0.000	<0.001
Median (IQR)	4 (2-4)	9 (9-9.75)		
Min-Max	0-4	9-10		

Table 7: Association between recovered from delirium and functionality at 4 weeks (n = 100)

	Recovered from delirium			Chi-squared test	
Functionality at 4 weeks	Yes	No	Total	χ^2	p-value
Grossly Impaired	0 (0.0%)	21 (77.8%)	21 (21.0%)	74.777	<0.001
Partially Impaired	29 (39.7%)	6 (22.2%)	35 (35.0%)		
Fully Regained	44 (60.3%)	0 (0.0%)	44 (44.0%)		
Total	73 (100.0%)	27 (100.0%)	100 (100.0%)		

functionality fully at the end of four weeks. 77.8% of the participants who were not recovered from delirium had impaired functionality grossly at the end of 4 weeks (Table 6).

Participants who were not recovered from delirium had the larger proportion of patients whose functionality was impaired grossly at the end of 4 weeks (Table 7).

The mean (SD) of hospital stays (Days) in the participants whose comorbid physical illness was aggravated was 16.48 days which is higher than participants whose comorbid physical illness was improved (9.43 days) (Table 8).

34.4% of the participants who died within four weeks had cerebrovascular accident. About 22.1% of the participants who were alive at the end of four weeks had meningitis (Table 9).

Participants who were died within four weeks had the larger proportion meningitis and participants who were alive had the larger proportion cerebrovascular accident (Table 10).

Participants who were died within four weeks had the larger proportion of primary reason for psychiatric referral were confusion and disorientation. Participants who were alive at the end of four weeks had the larger proportion of primary reason for psychiatric referral was restlessness (Table 11).

Table 8: Comparison of the 2 subgroups of the variable outcome of comorbid physical illness in terms of outcome: hospital stays (days) (n = 100)

	Outcome of comorbid physical illness		Wilcoxon-Mann-Whitney U test	
Outcome: Hospital stays (days)	Aggravated	Improved	W	p-value
Mean (SD)	16.48 (5.08)	9.43 (0.60)	93.500	<0.001
Median (IQR)	16 (15-16)	9 (9-10)		
Min-Max	8-35	9-11		

Table 9: Association between mortality and risk factors for delirium (n = 100)

	Mortality			Chi-squared test	
Risk factors for delirium	Yes	No	Total	χ^2	p-value
Meningitis	2 (6.2%)	15 (22.1%)	17 (17.0%)	46.215	<0.001
CVA	11 (34.4%)	4 (5.9%)	15 (15.0%)		
Neck femur fracture (post-surgical)	0 (0.0%)	9 (13.2%)	9 (9.0%)		
Pneumonia	4 (12.5%)	5 (7.4%)	9 (9.0%)		
Cardiogenic shock	2 (6.2%)	6 (8.8%)	8 (8.0%)		
Dyselectrolytemia	0 (0.0%)	7 (10.3%)	7 (7.0%)		
Eclampsia	2 (6.2%)	4 (5.9%)	6 (6.0%)		
Head Injury	6 (18.8%)	0 (0.0%)	6 (6.0%)		
Hepatic encephalopathy	0 (0.0%)	5 (7.4%)	5 (5.0%)		
Hypoglycaemia	0 (0.0%)	5 (7.4%)	5 (5.0%)		
Septicaemia	3 (9.4%)	1 (1.5%)	4 (4.0%)		
Ureamic encephalopathy	0 (0.0%)	4 (5.9%)	4 (4.0%)		
Choledocholithiasis (post-surgical)	2 (6.2%)	3 (4.4%)	5 (5.0%)		
Total	32 (100.0%)	68 (100.0%)	100 (100.0%)		

Table 10: Association between mortality and primary reason for psychiatric referral (n = 100)

	Mortality			Chi-squared test	
Primary Reason for Psychiatric Referral	Yes	No	Total	χ^2	p-value
Confusion	24 (35.3%)	11 (34.4%)	35 (35.0%)	12.793	0.005
Disorientation	21 (30.9%)	9 (28.1%)	30 (30.0%)		
Irrelevant Talk	18 (26.5%)	2 (6.2%)	20 (20.0%)		
Restlessness	5 (7.4%)	10 (31.2%)	15 (15.0%)		
Total	68 (100.0%)	32 (100.0%)	100 (100.0%)		

Table 11: Comparison of the 2 subgroups of the variable mortality in terms of admission-referral interval (days) (n = 100)

	Mortality		Wilcoxon-Mann-Whitney U Test	
Admission-referral interval (days)	Yes	No	W	p-value
Mean (SD)	3.15 (1.07)	2.62 (0.61)	1449.000	0.005
Median (IQR)	3 (3-4)	3 (2-3)		
Min-Max	1-5	1-4		

Table 12: Association between mortality and delirium motor subtype (n = 100)

	Mortality			Chi-squared test	
Delirium motor subtype	Yes	No	Total	χ^2	p-value
Hypoactive	43 (63.2%)	6 (18.8%)	49 (49.0%)	17.246	<0.001
Hyperactive	15 (22.1%)	16 (50.0%)	31 (31.0%)		
Mixed	10 (14.7%)	10 (31.2%)	20 (20.0%)		
Total	68 (100.0%)	32 (100.0%)	100 (100.0%)		

The mean (SD) of admission-referral interval (Days) in the participants who were died within four weeks was 3.15 days. The mean (SD) of Admission-referral interval (Days) in the participants who were alive at the end of four weeks was 2.62 days (Table 12).

Participants who were died within four weeks had the larger proportion of hypoactive subtype of delirium. Participants who were alive at the end of four weeks had the larger proportion of hyperactive type of delirium.

DISCUSSION

Present study was planned to assess and estimate sociodemographic profile, clinical profile, risk factors, motor subtypes and outcome of patients (aged between 18 to 65) of different medical wards of Burdwan Medical College Hospital, who were referred for psychiatric evaluation, diagnosed as delirium as per ICD-11, DCR Version. 100 such patients who fulfilled the selection criteria, were recruited for the current study. Those who were physically and psychologically too ill to fit for psychological assessment were excluded from the current study. They were treated for delirium and other medical and psychological illnesses as per standard treatment guideline as indicated. All of the patients were assessed on Day 0 on a pre-tested semi-structured socio-demographic data sheet to examine socio-demographic profile and on Day 0, Day 7 and Day 28 on clinical data sheet, Revised Delirium Rating Scale (DRD-R-98), Delirium Risk Factors Checklist (self-structured), Delirium Motor Subtype Scale (DMSS) and Delirium Outcome Proforma (self-structured) to measure clinical profile, pattern and severity of delirium, risk factors, subtypes and outcome of delirium respectively. Collected data are analysed by appropriate statistical method. The present study is summarized with the major findings in the following:

- Majority of patients (43%) were between the age group 51 to 60 years and 36% were above the age group 61 to 65 years, total 79% of patients were greater than above 51 years of age
- Majority of the patients were Male, Muslim, married, unemployed, from lower socio-economic rural joint family background and majority of them were educated up to high school
- Females are larger proportion of risk factors like meningitis, pneumonia, post operative cases of major surgery and dyselectrolytemia, while male has larger proportion of risk factors like cerebrovascular accident, metabolic encephalopathy and head injury
- The recovery from delirium and fully regaining of functionality at the end of 4 weeks is significantly more in female patients. The impairment of functionality is more in male, Muslim, below graduate patients and also in patients belonging from lower socio-economic rural background
- Major risk factors of delirium were meningitis, cerebrovascular accident, metabolic abnormality, cardiovascular accident, post operative cases of major surgery like major hip surgery and bile duct exploration surgery and last but not least dyselectrolytemia
- Most referrals were come from medical ward and CCU followed by surgical wards like General surgery, Orthopaedics and Gynaecology and obstetrics ward
- Major causes of referrals were confusion and disorientation, followed by irrelevant talk and behavioural disturbances
- Major motor subtypes of delirium are hypoactive, followed by hyperactive followed by mixed type
- Patients of hyperactive subtype of delirium had recovered more, while mixed subtype of delirium has more chances of not recovering from delirium
- Achievement of full functionality at the end of 4 weeks is highest in hyperactive subtype followed by hypoactive subtype. In case of hyperactive and hypoactive subtype of delirium, comorbid physical illness improved more, while aggravation of physical illness is more in mixed subtype of delirium. But those who recovered from delirium, the time to recovery is more or less similar (mean duration is 2 weeks) in three motor subtypes of delirium
- Mortality is majorly seen in post operative cases of major surgery (100%) followed by CCU (50%)
- Mean hospital stays are more in post operative cases of neck femur fracture (20 days), metabolic encephalopathy (16 days) and infections (meningitis 16.4 days and septicaemia 15.25 days), while mean hospital stays are lower in hypoglycaemia (9 days) and cerebrovascular accident (10 days)
- In hypoglycaemia the hospital stays are lesser due to early recovery but in case of cerebrovascular accident hospital stays are lower due to its fatality
- Hospital stays are lesser (13.90 days) in case referrals which are received on the very 1st day of appearance of symptoms of delirium
- The percentage of recovery from delirium is highest in meningitis (20.5%) and the percentage of not recovering from delirium is highest in cerebrovascular accident (40.7%)
- Mean Delirium Rating Scale-Revised 98 at the first day of interview (24.70 days) and at the end of four weeks (9.33 days) are higher in those patients who did not recover from delirium
- Delirium Rating Scale Revised 98 score significantly decreased within first seven days in the patients who recovered from delirium. Mean reduction of DRS-R 98 score in first seven days is 5.84
- Mortality was seen to be significantly higher (34.4%) in CVA than other risk factors
- Mortality was seen to be higher in those patients whose primary cause for referral was confusion and disorientation, while mortality was much lower in those patients who were referred due to restlessness
- Mortality was also lesser if admission-referral interval is lesser that if patient has been referred earlier, there have been less mortality. That is the reason behind restlessness patients are referred earlier, because they came into attention earlier and their mortality also is lesser
- Mean value of Delirium Rating Scale-Revised 98 of the dead patients at day 7 and day 28 was respectively 26.41 and 3.76 which is significantly higher than alive patients. Hospital staying was seen to be significantly prolonged (mean is 16.72 days) in dead patient with respect to alive patients (mean is 11.34 days)
- Mortality is highest (63.2%) in hypoactive motor subtype and is lowest (50%) in hyperactive motor subtype. Also, it was seen that mortality is more in male patients (84.4%)
- Mortality is highest in CCU patients (50%) and which are referred due to confusion (34.4%), that too statistically significant

LIMITATION

Despite the best effort, this study ended up with certain lacunae which should be considered while interpreting the results:

- Time bound nature of the work has limited the size of the sample of the present study
- The study has been done in a tertiary care hospital. So, hospital bias can't be ruled out
- The study has been carried out with the referral patients only. It does not interpret the whole patient population

- The study has been done in a single Centre
- Long term follow up could not be done in the study. Long term should have done to get longitudinal outcome the patients in long run period
- Ongoing COVID 19 pandemic and lockdown has further hampered the study

RECOMMENDATION

- In all hospitalized patients specially in elderly population strict monitoring of symptoms is recommended for early diagnosis of delirium
- Early Psychiatric consultation is recommended for better treatment approach
- Monitoring of common risk factors should be kept in mind for better outcome
- Proper psychoeducation to the nursing staffs, other ward attendants and care givers should be done. So that any subtypes of delirium could not be overlooked
- For fatal physical diseases like brain infections, cerebrovascular accidents and metabolic encephalopathy extra-edge should be given for early diagnosis and management of delirium for better treatment outcome

ACKNOWLEDGMENT

We are thankful to the all participants of this current study for their active cooperation and kind help. We are also thankful to the all category of staff of Burdwan Medical College and Hospital for their help.

REFERENCES

1. Sarkhel, S., 2009. Kaplan and Sadock's synopsis of psychiatry: Behavioural sciences/clinical psychiatry. Indian J. Psychiat., Vol. 51 No. 4.
2. World Health Organization, 2011. World report on ageing and health. World Health Organization, Geneva.
3. Gross, A.L., R.N. Jones, D.A. Habtemariam, T.G. Fong and D. Tommet, 2012. Delirium and long-term cognitive trajectory among persons with dementia. Arch. Intern. Med., 172: 1324-1331.
4. Silver, G.C. Traube, L.M. Gerber, X. Sun, J. Kearney, A. Patel and B. Greenwald, 2015. Pediatric delirium and associated risk factors: A single-center prospective observational study. Pediatr. Crit. Care Med., 16: 303-309.
5. Smith, P.J., D.K. Attix, B.C. Weldon, N.H. Greene and T.G. Monk, 2009. Executive function and depression as independent risk factors for postoperative delirium. Anesthesiology, 110: 781-787.
6. Wilson, K., C. Broadhurst, M. Diver, M. Jackson and P. Mottram, 2005. Plasma insulin growth factor-1 and incident delirium in older people. Int. J. Geriatr. Psychiatr., 20: 154-159.
7. Velayati, A., M.V. Shariatpanahi, E. Shahbazi and Z.V. Shariatpanahi, 2019. Association between preoperative nutritional status and postoperative delirium in individuals with coronary artery bypass graft surgery: A prospective cohort study. Nutrition, 66: 227-232.
8. Sanford, A.M. and J.H. Flaherty, 2014. Do nutrients play a role in delirium? Curr. Opin. Clin. Nutr. Metab. Care, 17: 45-50.
9. Smith, T.O., A. Cooper, G. Peryer, R. Griffiths, C. Fox and J. Cross, 2017. Factors predicting incidence of postoperative delirium in older people following hip fracture surgery: A systematic review and meta-analysis. Int. J. Geriatr. Psychiatry 32: 386-396.
10. Inouye, S.K., R.G. Westendorp and J.S. Saczynski, 2014. Delirium in elderly people. Lancet 383: 911-922.
11. de Rooij, S.E. and B.C. van Munster, 2013. Melatonin deficiency hypothesis in delirium: A synthesis of current evidence. Rejuvenation Res, 16: 273-278.
12. De Jonghe, A., J.C. Korevaar, B.C. van Munster and S.E. De Rooij, 2010. Effectiveness of melatonin treatment on circadian rhythm disturbances in dementia. Are there implications for delirium? A systematic review. Int. J. Geriatr. Psychiatr., Vol. 25.
13. Mathillas, J., B. Olofsson, H. Lövheim and Y. Gustafson, 2013. Thirty-day prevalence of delirium among very old people: A population-based study of very old people living at home and in institutions. Arch Gerontol Geriatr, 57, 298-304.
14. Bellelli, G., J.S. Brathwaite and P. Mazzola, 2021. Delirium: A marker of vulnerability in older people. Frontiers Aging Neurosci., Vol. 2021.
15. Berman, B.D., 2011. Neuroleptic malignant syndrome: A review for neurohospitalists. Neurohospitalist, 1: 41-47.