DISSERTATION ON

EVALUATION OF DELIRIUM IN HOSPITALIZED ELDERLY PATIENTS

Submitted in partial fulfillment of

M.D. DEGREE EXAMINATION BRANCH – XVI GERIATRIC MEDICINE

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY CHENNAI

MADRAS MEDICAL COLLEGE CHENNAI – 600003

MAY 2020

CERTIFICATE

This is to certify that the dissertation titled **"EVALUATION OF DELIRIUM IN HOSPITALIZED ELDERLY PATIENTS"** is the bonafide work done by **Dr. S.MOHANAVEL**, Post Graduate Student, Department of Geriatric Medicine, Madras Medical College, Chennai – 600003, in partial fulfillment of the University rules and regulations for the award of **MD DEGREE** in **GERIATRIC MEDICINE BRANCH – XVI**, under our guidance and supervision, for the examination to be held on **May 2020**.

Prof. Dr. G.S.SHANTHI, M.D. (Geriatrics),
Professor and Head,
Department of Geriatric Medicine,
MMC &RGGGH,
Chennai –600003

Prof. Dr. R.JAYANTHI, M.D., FRCP (Glasg).,
Dean,
MMC & RGGGH,
Chennai – 600003

DECLARATION

I solemnly declare that this dissertation titled **"EVALUATION OF DELIRIUM IN HOSPITALIZED ELDERLY PATIENTS"** was done by me at Madras Medical College, Chennai - 600003, during the period June 2018 to August 2019 under the guidance and supervision of **Prof. Dr. G.S.SHANTHI, M.D. (Geriatrics),** to be submitted to The Tamilnadu Dr. M.G.R. Medical University, towards the partial fulfillment of requirements for the award of **MD DEGREE IN GERIATRIC MEDICINE BRANCH –XVI**.

Dr. S.MOHANAVEL,
MD GERIATRIC MEDICINE,
Post Graduate Student,
Department of Geriatric Medicine,
Madras Medical College,
Chennai – 600003

PLACE: CHENNAI

DATE:

ACKNOWLEDGEMENT

I thank **Prof. Dr. R.JAYANTHI, M.D., FRCP (Glasg).,** Dean, Madras Medical College, for permitting me to conduct the study and use the hospital resources in the study.

I express my heartfelt gratitude to **Prof. Dr. G.S.SHANTHI, M.D., (Geriatrics),** Professor and Head, Department of Geriatric Medicine, for her inspiration, advice and guidance in making this work complete.

I also extend my sincere thanks to **Prof. Dr. G.USHA, M.D.,** Professor and **Prof. Dr. S.DEEPA, M.D.,** Associate Professor, Department of Geriatric Medicine for guiding me during the study period.

I am extremely thankful to **Dr. K.UMAKALYANI, M.D., D. Diab.,** Assistant Professor, **Dr. M.SENTHIL KUMAR, M.D.,** Assistant Professor, **Dr. D.THANGAM, M.D.,** Assistant Professor and **Dr. C.PRIYA MALINI, M.D., D. Diab.,** Assistant Professor, Department of Geriatric Medicine, for guiding me during the study period.

I also thank all the postgraduate students and paramedical staffs for their cooperation which enormously helped me in this study. I am also indebted to thank all the patients and their caring relatives, without whom this study would not have been possible.

Above all I thank the Lord Almighty for his kindness and benevolence.

TABLE OF CONTENTS

INTRODUCTION

INTRODUCTION

Delirium is one of the major Geriatric syndromes is defined as an acute decline in attention and global cognitive function. It affects nearly more than half of the hospitalized elderly population. It is often life threatening and is a potentially preventable source of morbidity and mortality for hospitalized elderly patients. It is preventable in 30% to 40% of cases.

Development of delirium often initiates a cascade of events resulting in functional decline, loss of independence, morbidity and mortality. Delirium increases hospital costs as well as post hospital costs in elderly population which is attributed to increased need for institutionalization, frequent medical follow-up, rehabilitation services and home health care. It is often iatrogenic in nature and because of its close linkage to the process of care, delirium incidence can serve as a marker for the quality of hospital care.

Delirium is often multi-factorial in nature. It often involves precipitating event in a vulnerable individual (predisposed individual). . Knowledge about predisposing factors is helpful in identifying high risk individuals, interventions needed to prevent delirium occurrence. Since precipitating factor is the event which results in delirium, correct identification and targeted intervention results in complete recovery from delirium. Unlike the predisposing factors, precipitating factors for delirium are modifiable and provides opportunity for intervention. The various predisposing factors and

precipitating events in elderly hospitalized patients were analyzed in this study

Abnormal psychomotor behavior is observed in delirious patients, varying from lethargy and somnolence to restlessness, agitation, and hyperactivity. Based on psychomotor activity delirium is classified as hypoactive, hyperactive, and mixed (both hypoactive and hyperactive).

Hypoactive delirium often goes unrecognized and carries an overall poorer prognosis. The reduced level of activity associated with hypoactive delirium, may contribute to its misdiagnosis or under recognition. Though hypoactive delirium is more common in elderly, we have proposed to analyze the subtypes of delirium prevalent in hospitalized elderly patients in our population.

AIM OF THE STUDY

AIM OF THE STUDY

The primary objective of this cross sectional study in hospitalized elderly patients includes:

1. To study the etiology of delirium (predisposing factors and precipitating factors)
2. To study the delirium subtypes (hypoactive/ hyperactive/ mixed)

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Delirium has been described throughout ancient medical literature. Hippocrates [460–370 BC] described it as ‘‘phrenitis,’’ a syndrome with confusion and restlessness that fluctuated unpredictably and was associated with physical illness.(1) Celsus first introduced the term ‘delirium’. It comes from the Latin word *de*, means down or away from, and *lira*, a furrow or track in the fields

Various terminologies or phrases for delirium used in literatures include

- Acute mental status change
- Acute brain dysfunction
- Brain failure
- Encephalopathy
- Postoperative psychosis
- Acute organic syndrome
- Acute confusional state
- ICU psychosis
- Confusional status
- ICU Syndrome (1)

The International Classification of Diseases- Tenth edition, version 2016 published by World Health Organization describes delirium in chapter V (Mental and behavioural disorder) and coded as F05.

"Delirium, not induced by alcohol and other psychoactive substances

An etiologically nonspecific syndrome characterized by concurrent disturbances of consciousness and attention, perception, thinking, memory, psychomotor behaviour, emotion, and the sleep-wake cycle. The duration is variable and the degree of severity ranges from mild to very severe.

Includes: acute or sub acute

- brain syndrome
- confusional state (non alcoholic)
- infective psychosis
- organic reaction
- psycho-organic syndrome

Excludes: Delirium tremens, alcohol induced or unspecified (F10.4)

F05.0 Delirium, not superimposed on dementia, so described

This code should be used for delirium that is not superimposed upon pre-existing dementia.

F05.1 Delirium, superimposed on dementia

This code should be used for conditions meeting the above criteria but developing in the course of a dementia (F00-F03).

F05.8 Other delirium

- Delirium of mixed origin
- Postoperative delirium

F05.9 Delirium, unspecified"(2)

ICD-10 Diagnostic guidelines (3)

'For a definite diagnosis, symptoms, mild or severe, should be present in each one of the following areas:

(a) Impairment of consciousness and attention (on a continuum from clouding to coma; reduced ability to direct, focus, sustain, and shift attention);

(b) Global disturbance of cognition (perceptual distortions, illusions and hallucinations - most often visual; impairment of abstract thinking and comprehension, with or without transient delusions, but typically with some degree of incoherence; impairment of immediate recall and of recent memory but with relatively intact remote memory; disorientation for time as well as, in more severe cases, for place and person);

(c) Psychomotor disturbances (hypo or hyperactivity and unpredictable shifts from one to the other; increased reaction time; increased or decreased flow of speech; enhanced startle reaction);

(d) Disturbance of the sleep - wake cycle (insomnia or, in severe cases, total sleep loss or reversal of the sleep-wake cycle; daytime drowsiness; nocturnal worsening of symptoms; disturbing dreams or nightmares, which may continue as hallucinations after awakening);

(e) Emotional disturbances, e.g. depression, anxiety or fear, irritability, euphoria, apathy, or wondering perplexity.

The onset is rapid, the course is diurnally fluctuating, and the total duration is less than 6 months. The above clinical picture is so characteristic that the diagnosis of delirium can be made even if the underlying cause is not clearly established. The evidence of cerebral dysfunction (e.g. an abnormal electroencephalogram) may be required if the diagnosis is in doubt.'

DSM V Diagnostic Criteria(4)

'A. A disturbance in attention (i.e., reduced ability to direct, focus, sustain, and shift attention) and awareness (reduced orientation to the environment).

B. The disturbance develops over a short period of time (usually hours to a few days), represents a change from baseline attention and awareness, and tends to fluctuate in severity during the course of a day.

C. An additional disturbance in cognition (e.g., memory deficit, disorientation, language, visuospatial ability, or perception).

D. The disturbances in Criteria A and C are not better explained by another preexisting, established, or evolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma.

E. There is evidence from the history, physical examination, or laboratory findings that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal (i.e., due to a drug of abuse or to a medication), or exposure to a toxin, or is due to multiple etiologies.'

EPIDEMIOLOGY:

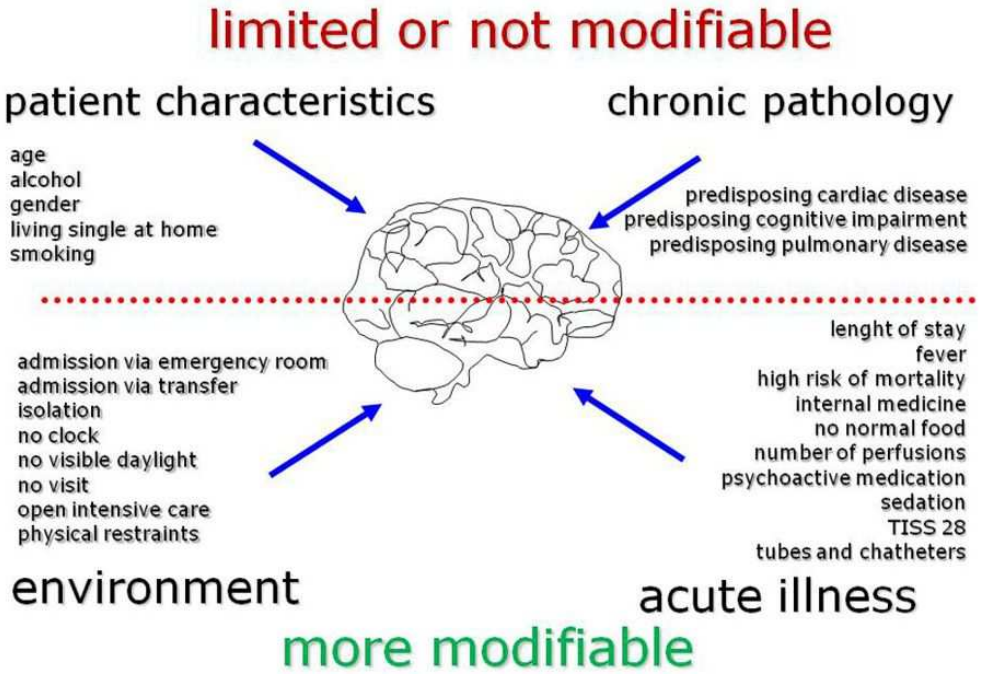
Delirium remains under recognized and misdiagnosed, and rates of identification have not improved over time among primary care physicians and nurses, it remains around 60% in 2015.(5) The prevalence in India is between 11 and 42 percent for elderly patients on medical wards.(6) The prevalence in older individuals presenting to emergency departments is 10 to 30 percent.(7) Incidence and prevalence rate of delirium in a study in India were 24.4% and 53.6% respectively.(7) In general hospital populations the prevalence of delirium when individuals are admitted to the hospital ranges from14 to 24 percent, and the incidence of delirium arising during hospitalization ranges from 6 to 56 percent.(6) Delirium occurs postoperatively in 15-53 per cent of older individuals and in 70-87 percent of those in intensive care units.(6) Delirium occurs in up to 60 per cent of individuals in nursing homes or post-acute care settings and in up to 83 per cent of all individuals at the end of life.(6)

RISK FACTORS:

Development of delirium depends on a complex interaction of multiple risk factors and is more often multi-factorial in nature. It is usually the result of interrelationship between patient's vulnerability (with predisposing factors) and noxious insults/stimuli occurring during hospitalization (precipitating factors). Some of these factors are modifiable and are potential targets for prevention.

Any patient can become delirious with a sufficient dose of noxious stimuli. The degree of noxious stimuli needed to cause the delirium depends on the vulnerability of the patient. Older patients are more susceptible because of the increased rates of predisposing conditions, including cognitive impairment, medical co-morbidities, functional impairment and the like(8).

In the intensive care units delirium risk factors are related to patient characteristics, chronic pathology, acute illness, and environment(9).



Adapted from Van Rompaey B, Elseviers MM, Schuurmans MJ, Shortridge-Baggett LM, Truijen S, Bossaert L. Risk factors for delirium in intensive care patients: a prospective cohort study. Critical Care. 2009 May 20;13(3):R77.

PREDISPOSING FACTORS:

Predisposing factors such as age, visual impairment, hearing impairment, severe illness, and cognitive impairment are the baseline

vulnerabilities of an older person. Predisposing risk factors induce brain network alterations, creating a more vulnerable (i.e. less connected and/or less integrated) brain network.(10) Predisposing factors for delirium are related to patient characteristics and chronic pathology (9).

The leading predisposing risk factors consistently identified at admission in both medical and non-cardiac surgery populations were dementia or cognitive impairment, functional impairment, visual impairment, history of alcohol misuse, and advanced age (>70 years). Co-morbidity burden or presence of specific co-morbidities (e.g. stroke, depression) were associated with an increased risk in all populations(11)

Dementia was the predisposing factor with the highest predictive capacity in a nursing home based study (12)

Predisposing, non-modifiable risk factors for delirium(13)

- Dementia or cognitive impairment
- Advancing age (>65 years)
- History of delirium, stroke, neurological disease, falls or gait disorder
- Multiple co-morbidities
- Male sex
- Chronic renal or hepatic disease

Predisposing Factors for Delirium(14)

Demographic characteristics

- Age of 65 years or older
- Male sex

Functional status

- Functional dependence
- Immobility
- Low level of activity
- History of falls

Cognitive status

- Dementia
- Cognitive impairment
- History of delirium
- Depression

Sensory impairment

- Visual impairment
- Hearing impairment

Drugs

- Treatment with multiple psychoactive drugs
- Treatment with many drugs
- Alcohol abuse

Decreased oral intake

- Dehydration
- Malnutrition

Coexisting medical conditions

- Severe illness
- Multiple coexisting conditions
- Metabolic derangements
- Fracture or trauma
- Terminal illness
- Infection with human immunodeficiency virus
- Chronic renal or hepatic disease
- History of stroke
- Neurologic disease

PRECIPITATING FACTORS:

Precipitating factors are the acute and noxious insults experienced by an older person such as infection, metabolic derangement, or surgery. Precipitating factors may cause an acute alteration in brain dynamics, that results in a global loss of functional brain interactions resulting in delirium.(10) Precipitating factors for delirium are related to acute illness and the environment, and several of these factors are suitable for preventive action.(9) Precipitating factors vary across different populations.

In medical patients, polypharmacy, use of psychoactive drugs, and physical restraints were the leading factors.(11) Mechanical ventilation, raised levels of bilirubin and creatinine, fever, hypoxia, and benzodiazepine administration significantly precipitated delirium in ICU. In the presence of dementia, falls, neuroleptics and anticholinergic drug use were identified as triggering factors in a nursing home based study.(12)

Potentially modifiable risk factors (Precipitating factors)(13)

- Sensory impairment (hearing or vision)
- Immobilization (catheters or restraints)
- Medications (for example, sedative hypnotics, narcotics, anti-cholinergic drugs, corticosteroids, poly-pharmacy, withdrawal of alcohol or other drugs)

- Acute neurological diseases (for example, acute stroke [usually right parietal], intracranial hemorrhage, meningitis, encephalitis)
- Intercurrent illness (for example, infections, iatrogenic complications, severe acute illness, anemia, dehydration, poor nutritional status, fracture or trauma, HIV infection)
- Metabolic derangement
- Surgery
- Environment (for example, admission to an intensive care unit)
- Pain
- Emotional distress
- Sustained sleep deprivation

Precipitating Factors or Insults That Can Contribute to Delirium.(14)

Drugs

- Sedative hypnotics
- Narcotics
- Anticholinergic drugs
- Treatment with multiple drugs
- Alcohol or drug withdrawal

Intercurrent illnesses

- Infections

- Hypoxia
- Shock
- Fever or hypothermia
- Anemia
- Dehydration
- Metabolic derangements (e.g., electrolyte, glucose, acid–base)
- Iatrogenic complications
- Severe acute illness
- Poor nutritional status
- Low serum albumin level

Primary neurologic diseases

- Stroke, particularly non dominant hemispheric
- Intracranial bleeding
- Meningitis or encephalitis

Surgery

- Orthopedic surgery
- Prolonged cardiopulmonary bypass
- Non cardiac surgery
- Cardiac surgery

Environmental

- Admission to an intensive care unit
- Use of bladder catheter
- Use of multiple procedures
- Use of physical restraints
- Pain
- Emotional stress

Prolonged sleep deprivation

PATHOPHYSIOLOGY:

The fundamental pathophysiology of delirium remains unclear. Delirium is thought to be functional rather than a structural lesion. Interactions between various risk factors result in disruption of large-scale neuronal networks in the brain, leading to delirium. In old people, there is gradual accumulation of permanent damage to neurons, receptors, and microglia, and the effects of cerebrovascular diseases or cognitive impairment, which can make them susceptible to delirium when biologically stressed. Age-related changes in central neurotransmission, stress management, hormonal regulation, and immune response may contribute to the increased vulnerability of older persons to delirium. Some of the leading mechanisms postulated to contribute to delirium include neurotransmitters, inflammation,

physiological stressors, metabolic derangements, electrolyte disorders, and genetic factors(11)

According to the neurotransmitter hypothesis, various etiologic factors cause neurotransmitter abnormalities by decreased cerebral oxidative metabolism leading to cerebral dysfunction.(15) Reduced cholinergic function, excess release of dopamine, norepinephrine, and glutamate, and both decreased and increased serotonergic and gamma-aminobutyric acid activity may underlie the different symptoms and clinical presentations of delirium.(16)

Chronic stress activates the sympathetic nervous system and the hypothalamus-hypophysis-suprarenal glands axis, which elevate the cytokines levels and results in chronic hypercortisolism that can cause an alteration in the hippocampus function. High cortisol levels have been hypothesized to precipitate and/ or sustain delirium.(17)

Pathophysiology of Sepsis associated delirium is poorly understood, it involves blood native cytokines (IL-1, IL-6, TNF-α) to penetrate the central nervous system through different mechanisms: disruption of the damaged blood brain barrier (BBB) permits the cytokines to pass from the blood into the CNS; the BBB is absent in the circumventricular organs that are located nearby the midline ventricular system; this allows the cytokines to directly interact with neuroendocrine structures; finally, cytokines may use of

specific carriers. Cytokines in turn activate pericytes, macroglial cells and astrocytes inducing neuroinflammation and neuronal damage.(18)

According to the inflammatory hypothesis, increased cerebral secretion of cytokines due to a wide range of physically stressful events plays an important role in the occurrence of delirium. Since cytokines can influence the activity of various neurotransmitters these mechanism can interact.(16)

Delirium was consistently associated with functional network disruptions, including lower EEG connectivity strength and decreased functional MRI network integration. Decreased connectivity strength and efficiency appear to characterize structural brain networks of patients at risk for delirium, possibly impairing the functional network, while functional network disintegration seems to be a final common pathway for the delirium.(10)

Drugs are the most common reversible cause of delirium. Anticholinergic medications, benzodiazepines, and narcotics in high doses are common causes of drug induced delirium. The mechanisms for this condition, especially the neurotransmitter imbalances involving acetylcholine, dopamine, and gamma amino butyric acid and the age related changes that may contribute to altered pharmacological effects which have a role in delirium.(19)

CLINICAL FEATURES: (17)

Delirium is a clinical diagnosis. It is commonly unrecognized in up to 70% of older patients. Obtaining history from the close family members or caregivers is important in making a correct diagnosis of delirium. Sudden, acute onset and fluctuating course are the central features of delirium. Falling asleep during interview, conflicting reports about mental status of the patient provided by various caregivers are clues for fluctuating course.(15)

Therefore, it is important to establish the patient's baseline cognitive status and the course of cognitive change. These may be intermittent, and are often worse at night. In delirium, the disturbance of consciousness is one of the earliest manifestations. Consciousness is the awareness of oneself and of the environment. It should be considered as a continuum from full alertness and awareness to coma. In delirium, inattention occurs and it is also considered one of the important cardinal features. Forgetting instructions, distraction to irrelevant stimuli, repeatedly asking the same question, gives different replies to same question are important clues for inattention.(15)

Typically there are global or multiple deficits in cognition, including memory impairment and disorientation. The short-term memory is the most commonly affected but retrieval of stored information can also be disturbed.

Forgetting about medicines, meals, visitors, etc, forgetting about things recently discussed are clues for memory impairment.(15)

Disorientation is usually common, first in reference to time and then to place. Not able to say properly about the time, day, month, where they are, misidentifying persons around them, talking as if at home, talking about dead relatives, or relatives who are not present around the patient at that time are clues for disorientation.(15)

The functions of thinking and speaking can be impaired in delirium. Language disturbances found in the course of delirium includes word intrusion and unrelated misnaming. Incoherent or rambling or irrelevant speech, pressure of speech, naming things incorrectly, inability to understand what is being said, are evidence for speech and language disturbance(15)

Another clinical feature is disorganized thinking, manifested by incoherent speech, rambling or irrelevant conversation, or unclear or illogical flow of ideas. Their judgment and insight may be poor and delusions can also occur in around 30% of the cases. Perceptual disturbances have also been described in people with delirium includes illusions, misinterpretations and hallucinations. Visual hallucinations are the most frequent, often occurring at night.

There are other clinical features commonly associated with delirium that are not included in the diagnostic criteria. One of them is sleep-wake cycle disturbance: Not able to sleep at night, interrupted sleep, day time sleepiness; all observed/ reported by others, Reversal of sleep-wake cycle (sleeping in day and awake during night).(15)

Disturbed psychomotor behavior is another clinical feature of delirium, with unusually increased or decreased motor activity. In the first case, patients may have restlessness or frequent sudden changes of position. On the other hand, the patient may also show sluggishness or lethargy, approaching stupor.

Clinical features of delirium from historical/objective evidence(15)

"Perceptual disturbances: Visual hallucinations, tactile hallucinations (report crawling sensation over the body as if some insects are present), auditory hallucinations (hearing things which others do/ cannot), Misinterpretation (alarm of a machine may be interpreted as police siren), Illusions (interpret folds of bed sheets or blankets as animate objects)

Thought process abnormalities: Inability to think clearly and coherently, Delusions (say people are trying to harm them; say the neighbouring patient or member from treating team is going to harm them etc.)

Agitation: Trying to get out of bed repeatedly, Wandering around in the ward or house, Try to pull out the tubes or catheters repeatedly, frequently changing posture in the bed

Apathy and withdrawal: Minimal activity, Minimal or reduced verbal output

Emotional (affective) disturbances: May demonstrate fluctuations in emotional state varying from anxiety, sadness, fearfulness to euphoria"

The disturbances in attention often increase toward evening, a characteristic known as 'sundowning', which may result from fatigue and reduced sensory input. Restlessness in a sedentary position is a more reliable clinical feature than wandering and changing of posture when looking for delirium in geriatric patients.(20) 'Paratonic rigidity' (defined as velocity dependent resistance to passive movements, less evident when limbs are moved slowly) can be present in sepsis associated delirium.(18)

SUBTYPES OF DELIRIUM:

Four different delirium motor subtypes have been described- hyperactive, hypoactive, mixed delirium with both hyperactive and hypoactive features and no-subtype.(21) Each delirium subtype can result from different pathophysiological mechanisms and each carrying different prognosis(13). There were no significant differences in one-year mortality, length of stay or institutionalization across delirium motor subtypes in

geriatric patients, although the study may indicate better prognosis in the no subtype group.(22)

DSM V describes three subtypes of delirium based on the level of psychomotor activity – hyperactive, hypoactive and mixed level of activity.(4) All three subtypes had an elevated risk of dying during 1-year follow up relative to the normal psychomotor group, though the hypoactive group had the highest mortality risk.(23)

Hyperactive delirium: hyperactive symptoms include hyper vigilance, restlessness, fast or loud speech, irritability, combativeness, impatience, swearing, singing, laughing, uncooperativeness, euphoria, anger, wandering, easy startling, fast motor responses, distractibility, tangentiality, nightmares and persistent thoughts. Delirious patients who had three or more different symptoms of 'hyperactivity' were rated as 'hyperactive delirium'.(21) Common risk factors for patients with hyperactive delirium (substance withdrawal, anticholinergic agents, etc).(24)

Hypoactive delirium: 'Hypoactive' symptoms include unawareness, decreased alertness, sparse or slow speech, lethargy, slowed movements, staring, and apathy. Those who had four or more different symptoms of 'hypoactivity' were rated as 'hypoactive delirium'.(21) Hypoactive delirium frequently goes undetected, which can delay diagnosis and further management. It is the most common subtype among hospitalized older patients. Common risk factors for patients with hypoactive delirium (

previous diagnosis of dementia, older age, hypoxia, substance intoxication, hypodopaminergic states) (24)

Mixed delirium: Patients with mixed delirium demonstrate both hyperactive and hypoactive features. There is fluctuation in activity level, cognitive disturbance, level of consciousness and organization of thinking.

CLINICAL APPROACH TO DIAGNOSIS:

The current reference standard diagnostic criteria are the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition) (DSM-5) from the American Psychiatric Association (4) and the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision from the World Health Organization.(3)

Confusion Assessment Method: (CAM) is a standardized evidence-based tool that enables non-psychiatrically trained clinicians to identify and recognize delirium quickly and accurately in both clinical and research settings. It is the most widely used delirium instrument worldwide. It has high sensitivity (94%-100%), specificity (90%-95%), and inter-rater reliability.(5)

The Confusion Assessment Method (CAM) Diagnostic Algorithm(25)**:**

"Feature 1: Acute Onset or Fluctuating Course

This feature is usually obtained from a family member or nurse and is shown by positive responses to the following questions:

Is there evidence of an acute change in mental status from the patient's baseline? Did the (abnormal) behavior fluctuate during the day, that is, tend to come and go, or increase and decrease in severity?

Feature 2: Inattention

This feature is shown by a positive response to the following question: Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?

Feature 3: Disorganized thinking

This feature is shown by a positive response to the following question: Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

Feature 4: Altered Level of consciousness

This feature is shown by any answer other than "alert" to the following question: Overall, how would you rate this patient's level of consciousness?

(alert [normal]), vigilant [hyper alert], lethargic [drowsy, easily aroused], stupor [difficult to arouse], or coma [unarousable])

The diagnosis of delirium by CAM requires the presence of features 1 and 2 and either 3 or 4.

Other features in CAM instrument that aids in diagnosis:

5. Disorientation: Was the patient disoriented at any time during the interview, such as thinking that he or she was somewhere other than the hospital, using the wrong bed, or misjudging the time of day?

6. **Memory impairment:** Did the patient demonstrate any memory problems during the interview, such as inability to remember events in the hospital or difficulty remembering instructions?

7. **Perceptual disturbances:** Did the patient have any evidence of perceptual disturbances, for example, hallucinations, illusions or misinterpretations (such as thinking something was moving when it was not)?

8A. **Psychomotor agitation:** At any time during the interview did the patient have an unusually increased level of motor activity such as restlessness, picking at bedclothes, tapping fingers or making frequent sudden changes of position?

8B. **Psychomotor retardation:** At any time during the interview did the patient have an unusually decreased level of motor activity such as sluggishness, staring into space, staying in one position for a long time or moving very slowly?

9. **Altered sleep-wake cycle:** Did the patient have evidence of disturbance of the sleep-wake cycle, such as excessive daytime sleepiness with insomnia at night?"

Delirium Rating Scale-R-98: (DRS-R-98) (26)(27)It is a 16-item clinician-rated scale with 13 severity items and 3 diagnostic items. It is a revised version of the 1988 DRS. Diagnostic items include: Temporal onset of items; Fluctuation of symptom severity; Physical disorder. Severity items include: Sleep-wake cycle disturbance; Perceptual disturbances and hallucinations; Delusions; Lability of affect; Language; Thought process abnormalities; Motor agitation/retardation; Orientation; Attention; Short/Long term memory; Visuospatial ability. Severity items are rated on a scale of 0-3 and diagnostic items are rated on a scale of 0-2 or 0-3. The maximum possible score for severity items is 39, while the maximum total score is 46. Higher scores indicate more severe delirium; score of 0 indicates no delirium. It can be completed by psychiatrist, other physician, nurse, and psychologist with adequate training. All available sources of information about patient, including information from family, visitors, hospital staff, physicians, and medical records can be used in this scale. Sensitivity (ROC

analysis; delirium group vs. all other groups [92% with cutoff at 15.25; 92% at 17.75]) Specificity (ROC analysis; delirium group vs. all other groups [86% with cutoff at 15.25; 95% at 17.75])

Other delirium screening test includes:

- Clinical Assessment of Confusion (CAC)
- The Delirium Observation Screening Scale
- NEECHAM Confusion Scale
- The Bedside confusion scale
- The 4AT
- Memorial Delirium Assessment Scale
- Cognitive Test for Delirium (CTD)
- Confusion Assessment Method—ICU version (CAM-ICU)
- 3D-CAM
- Confusion Rating Scale (CRS)
- Delirium Index
- Delirium-O-Meter
- Delirium Symptoms Interview (DSI)
- Delirium Diagnostic Test—Provisional (DDT-Pro)
- Intensive Care Delirium Screening Checklist (ICDSC)
- Nursing Delirium Screening Scale (Nu-DESC)
- Single Question in Delirium (SQiD)

Physical examination should include a detailed neurological examination for focal deficits and a careful research for signs of head trauma, falls, infection, etc. Unexplained new or new focal neurological signs are atypical in delirium and warrant neuroimaging. Delirium may be the sole manifestation of serious Underlying disease, for example sepsis, pneumonia in the elderly. Therefore a thorough medical evaluation is required, especially in the elderly where nonspecific or atypical presentation of the underlying illness is frequent.

The laboratory evaluation must be based on clinical judgment and should be tailored to the individual situation. There is no single panel of laboratory tools that is recommended for all cases of delirium. Targeted laboratory testing for an elderly patient with delirium should include Complete blood count, plasma glucose, urea, creatinine, serum electrolytes and urine analysis.

Other tests, that may warranted in individual situations include chest x ray, ECG, liver function test, arterial blood gas analysis, thyroid function test, culture of body fluids, serum cortisol, serum B_{12}/ folate assay, CSF analysis, EEG, brain imaging.

CSF analysis is for patients with fever and acute confusion were meningitis or encephalitis must be excluded. Brain imaging is reserved for cases with focal neurological signs.

EEG in delirium demonstrates generalized slowing into the theta and delta ranges and slowing of the alpha frequency. It plays a limited role in clinical practice. EEG may be useful in differentiating delirium from non organic psychiatric disorders.(28)

DELIRIUM SUPERIMPOSED ON DELIRIUM:

Because cognitive impairment may easily be missed during routine conversation, brief cognitive screening tests, such as the Short Portable Mental Status Questionnaire, Mini-Cog test, or 3D-CAM assessment, should be used to rate the CAM.

Cognitive deficits constitute an important risk factor for delirium and when co morbid with delirium may result in a worst post delirium follow-up prognosis. In a systematic review, it is found that delirium in persons with dementia is associated with more hospital readmissions and higher rates of institutionalization and mortality. Prevalence of delirium in dementia patients ranges between 22% and 89%.(29) Delirium superimposed on dementia (DSD) was associated with increased mortality and new institutionalization at one month and at 1 year.(30)

For every point the MMSE decreases in the cognitive impairment group, the odds for becoming delirious increases by 0.164. Further, this correlation between severity of cognitive impairment and delirium severity was

significant where for each unit that the MMSE worsened, the DRS-R98 score increased by 0.4.(31)

DIFFERENTIAL DIAGNOSIS:

Delirium should be differentiated from

1. Dementia- differentiated by the acute onset of symptoms in delirium, with dementia presenting more insidiously and by the impaired attention and altered level of consciousness associated with delirium.
2. Depression and
3. Non organic psychotic disorders

PREVENTION OF DELIRIUM:

Non pharmacological intervention:

There is a benefit in the non-pharmacological intervention for the prevention of delirium using family members, when compared with standard management.(32) It consists of following six elements:

- Education: the observers conducted brief interviews with each patient's family members, in which the main aspects regarding the clinical features and prognostic implications of acute confusional syndromes were explained.
- Provision of a clock (analogue or digital) and calendar in the room.

- Avoidance of sensory deprivation (glasses, denture and hearing aids must be available as needed).
- Presence of familiar objects in the room (photographs, cushions and radio).
- Reorientation of patient provided by family members (current date and time, recent events).
- Extended visitors times (5 h daily).

Proactive geriatrics consultation may play an important role in the acute hospital management of hip-fracture patients. It reduced delirium by over one-third and reduced severe delirium by over one-half.(33)

Content of the Structured Geriatrics Consultation(33)**:**

"1. Adequate CNS oxygen delivery:

- Supplemental oxygen to keep saturation >90%,
- Treatment to raise systolic blood pressure >2/3 baseline or >90 mmHg
- Transfusion to keep hematocrit >30%

2. Fluid/electrolyte balance:

- Treatment to restore serum sodium, potassium, glucose to normal limits
- Treat fluid overload or dehydration

3. Treatment of severe pain:

- Around-the-clock Acetaminophen
- Early-stage break-through pain: low-dose subcutaneous Morphine
- Late-stage break-through pain: Oxycodone

4. Elimination of unnecessary medications:

- Discontinue/ minimize benzodiazepines, anticholinergics, antihistamines
- Eliminate drug interactions, adverse effects, modify drugs accordingly
- Eliminate medication redundancies

5. Regulation of bowel/bladder function:

- Bowel movement by postoperative day 2 and every 48 hours
- Discontinue urinary catheter by postoperative day 2,
- Skin care program for patients with established incontinence

6. Adequate nutritional intake:

- Dentures used properly, proper positioning for meals
- Supplements: 1 can Ensure, 3 cans Ensure for poor oral intake
- If unable to take food orally, feed via temporary nasogastric tube

7. Early mobilization and rehabilitation:

- Out of bed on postoperative day 1 and several hours daily

- Mobilize by nursing staff as tolerated, such as to bathroom
- Daily physical therapy; occupational therapy if needed

8. Prevention, early detection, and treatment of major postoperative complications:

- Myocardial infarction/ischemia- electrocardiogram, cardiac enzymes if needed
- Supraventricular arrhythmias/ atrial fibrillation- appropriate rate control, electrolyte adjustments, anticoagulation
- Pneumonia/chronic obstructive pulmonary disease—screening, treatment, including chest therapy
- Pulmonary embolus- appropriate anticoagulation
- Screening for and treatment of urinary tract infection

9. Appropriate environmental stimuli:

- Appropriate use of glasses and hearing aids
- Provision of clock and calendar
- If available, use of radio, tape recorder, and soft lighting

10. Treatment of agitated delirium:

- Appropriate diagnostic workup/ management
- For agitation, calm reassurance, family presence

- For agitation, if absolutely necessary, low-dose Haloperidol 0.25–0.5 mg every 4 hours as needed; if contraindicated, use Lorazepam at same dose”

Multi-component non pharmacological delirium prevention interventions are effective in reducing delirium incidence and preventing falls, which also decreases length of stay and avoids institutionalization.(34)

Pharmacological intervention:

Several studies on ICU patients for postoperative care reported a significant reduction in delirium incidence favoring the pharmacologic agent. There is some evidence that haloperidol, newer neuroleptics (e.g., Risperidone or Olanzapine), and Melatonin may be effective in reducing the incidence of postoperative delirium.(35)

Prophylactic low dose haloperidol may reduce severity and duration of delirium episodes and shorten length of hospital admission in hip surgery(36)

For elderly patients admitted to intensive care unit after non cardiac surgery, short-term prophylactic administration of low-dose intravenous Haloperidol significantly decreased the incidence of postoperative delirium(37)

A single dose of Risperidone 1 mg orally administered soon after cardiac surgery with cardiopulmonary bypass reduces the incidence of postoperative delirium(38)

For patients aged over 65 years who are admitted to the intensive care unit after non-cardiac surgery, prophylactic low-dose Dexmedetomidine significantly decreases the occurrence of delirium during the first 7 days after surgery(39)

Sleep deprivation is a well known precipitating factor for delirium and several studies using melatonin to prevent delirium have been performed. However, the results are conflicting and there is insufficient evidence to recommend Melatonin for the prevention of delirium.(40)

Among critically ill adults at high risk of delirium, the use of prophylactic Haloperidol compared with placebo did not improve survival at 28 days.(41)

Page et al., suggest that commonly used Haloperidol dose regimen does not decrease delirium in an unselected population of critically ill patients requiring mechanical ventilation, when commenced early during ICU stay.(42)

TREATMENT:

Non pharmacological treatment

Early delirium recognition and management may aid in delirium resolution and shorten the length of stay. Increasing exposure to daylight, boosting family contact and avoiding use of restraints are endorsed by intensivists. The Hospital Elder Life Program (HELP) is one of the approaches targeted to delirium. It uses an interdisciplinary team and trained volunteers to implement interventions, including reorientation, early mobilization, therapeutic activities, hydration, nutrition, sleep strategies, and hearing and vision adaptations.(34)

Liberation and Animation strategy: Liberation aims to reduce the harmful effects of sedative exposure through use of target-based sedation protocols, spontaneous awakening trials, and proper choice of sedative as well as liberation from the ventilator and the ICU. Animation refers to early mobilization, which reduces delirium and improves neurocognitive outcomes(43)

Pharmacological treatment

Pharmacological interventions in delirium are considered for the management of behavioral symptoms, but not for the basic treatment of this condition. Recent evidence indicates that the use of antipsychotics is not safe in elderly patients, especially in those with dementia.(17) Haloperidol

and atypical anti-psychotics have emerged as the standard pharmacological treatments for delirium in the ICU.(44) Benzodiazepines have also been recommended, but only in delirium due to alcohol and benzodiazepine withdrawal, or neuroleptic malignant syndrome.(17)

OUTCOMES:

Delirium is an important independent prognostic determinant of hospital outcomes including death or new nursing home placement, and functional decline.(45) It also increases length of stay in the hospital and the number of patients discharged to nursing or residential institutions. Important predictors of poor outcome include the duration of the delirium episode, delirium severity, a hypoactive motor subtype and pre-existing psychiatric morbidity with dementia or depression.(30) Hypoactive delirium may be associated with increased risk complications of inactivity like pressure damage, hypoventilation and venous thrombosis, dehydration.(30)

MATERIALS AND METHODS

MATERIALS AND METHODS

STUDY CENTRE:

Rajiv Gandhi Government General Hospital, Chennai.

Geriatric Medicine- Male ward, Female Ward and Geriatric ICU

Internal Medicine- Male wards, Female Wards & Intensive medical care unit

STUDY DURATION: 15 months (June 2018 – August 2019)

STUDY DESIGN: Cross sectional observational study

SAMPLE SIZE: 300 patients

INCLUSION CRITERIA:

Patients aged above 60 years admitted in geriatric & medical wards, GICU & IMCU with delirium, who are willing for the study.

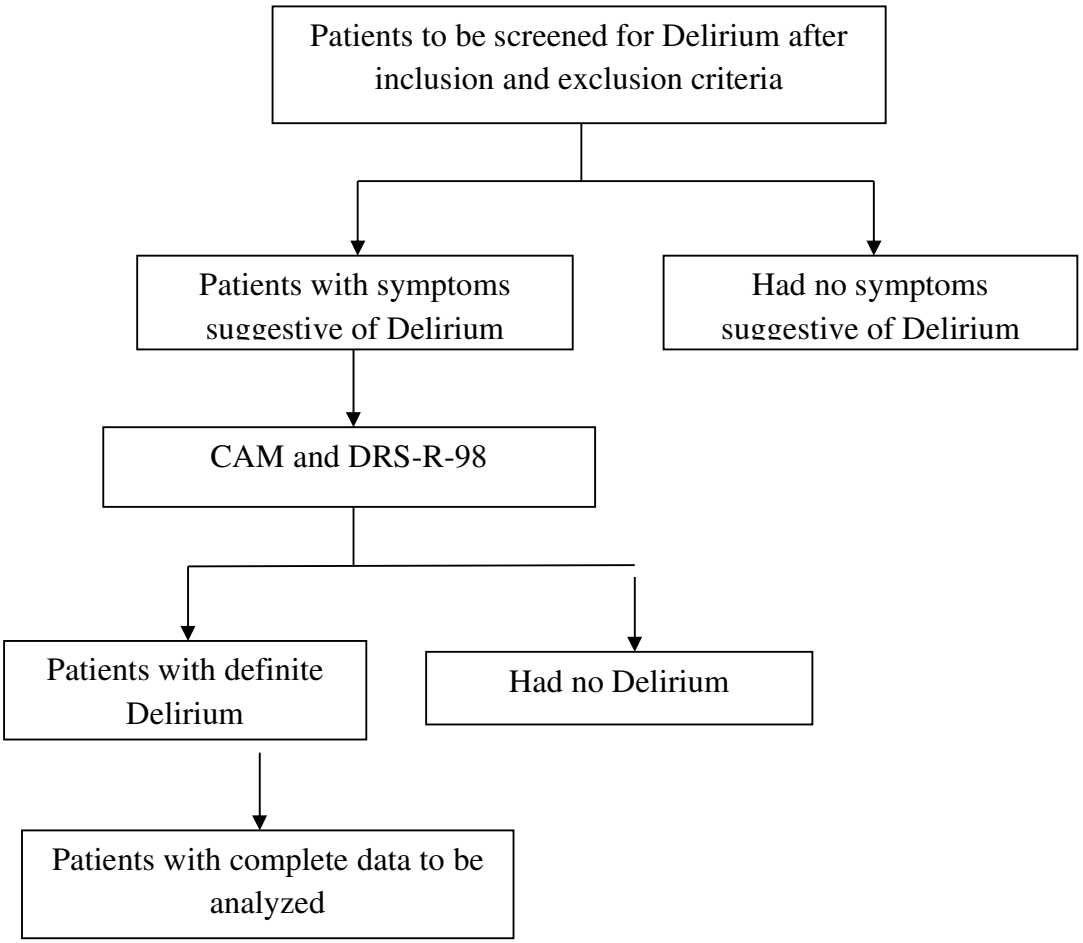
EXCLUSION CRITERIA:

1. Person aged above 60 years admitted in geriatric & medical wards, GICU & IMCU with delirium, who are not willing for the study.
2. Patients in very moribund state.

PROCEDURE:

All patients with symptoms suggestive of delirium were screened after inclusion and exclusion criteria. Patients with definitive delirium diagnosed by confusion assessment method, there severity assessed by delirium rating scale-R-98 were analyzed for various predisposing factors, precipitating

factors and delirium subtypes (hypoactive/ hyperactive/ mixed) by using Richmond agitation sedation scale and by clinical criteria. Confusion Assessment Method is a well validated tool for delirium with sensitivity of 94 to 100%, specificity of 90 to 95%. Delirium Rating Scale-R-98 is a validated tool for severity assessment with sensitivity 92%, specificity of 86 to 95%. Mini-cog is a well validated tool for cognitive assessment.



DATA COLLECTION:

Data including age of the patient, sex, education, care giver, address were collected from patient and their care givers. It is often difficult to obtain history from confused and uncooperative patients. So history is obtained from care givers, family members and from past medical records. Present history include basic activities of daily living were obtained. Past history including cognitive status, psychiatric illness, drugs, history regarding visual and hearing impairment were obtained from the care givers and medical records. Personal history regarding smoking, alcohol abuse and bowel & bladder habits were collected.

General examination include hydration status, skin condition, vital signs were assessed. All Systemic examination was performed.

Patient prior cognitive status was obtained from history and from Mini-cog test which is applied during lucid interval. Patients were observed for medical devices like Foley's catheter, Ryle's tube, etc.

LABORATORY STUDIES:

Test done in all patients include complete blood cell count, electrolytes, blood glucose, renal function test, liver function test, urine analysis, electrocardiogram. Special investigations as per indication of patients if needed include thyroid function test, blood culture, urine culture,

neuroimaging, chest X ray, lumbar puncture and arterial blood gas analysis. All patients were treated accordingly.

The age and sex distribution, risk factors (predisposing and precipitating factors) were analyzed and subtypes of delirium were analyzed. Comparisons were made with the Pearson chi-square test.

RESULTS

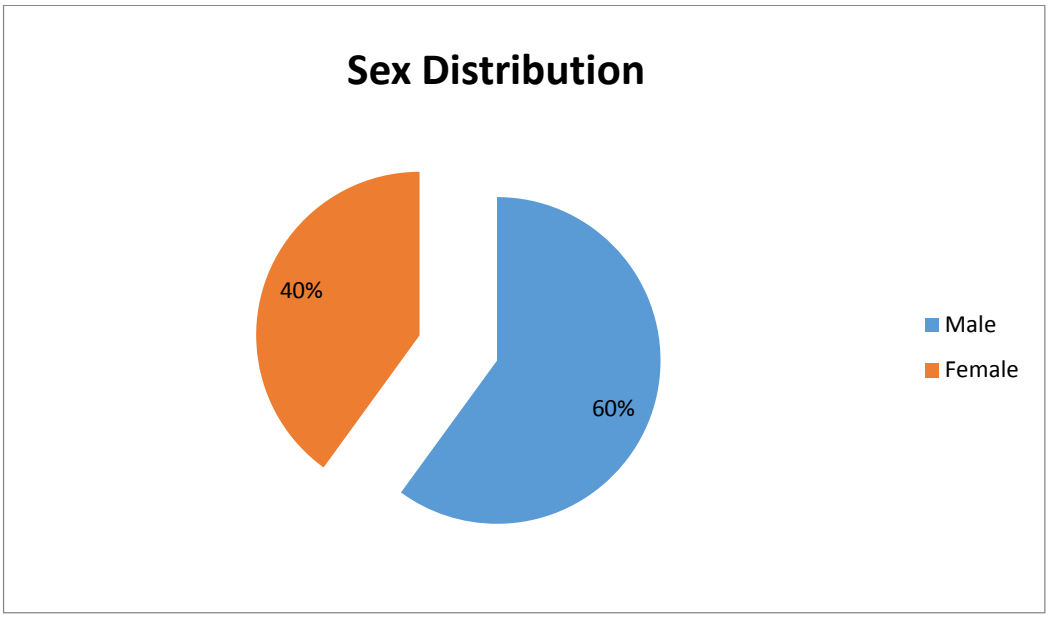
RESULTS

SEX DISTRIBUTION

In this study 300 elderly patients who had delirium are studied, among which 60 percent are males and 40 percent are females.

SEX DISTRIBUTION

Study population	Frequency	Percent
Male	181	60.3
Female	119	39.7
Total	300	100

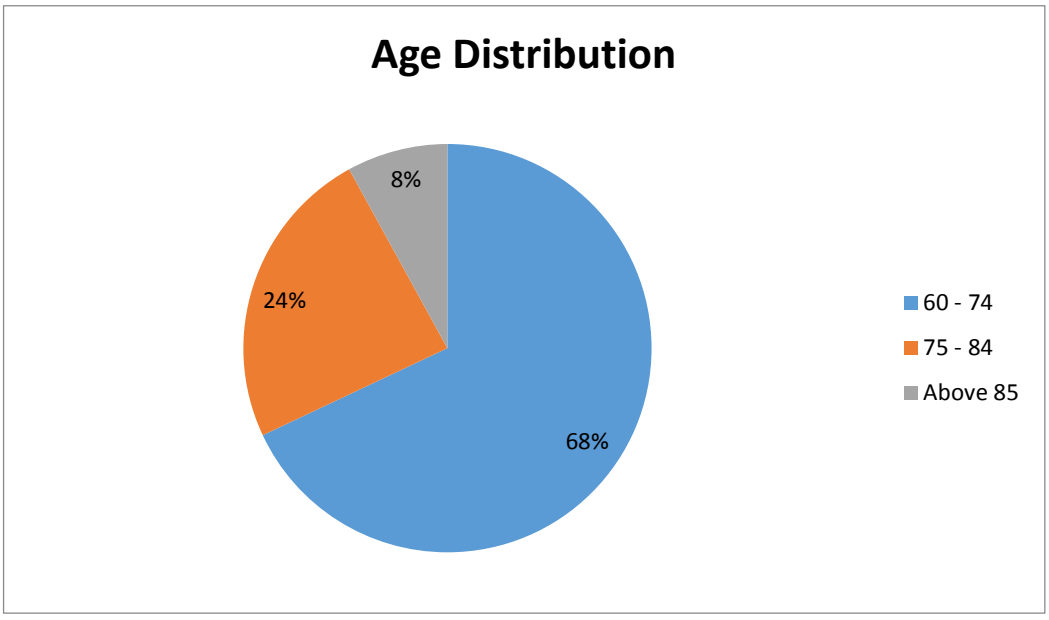


AGE DISTRIBUTION

Among the delirious patient in our study, patients aged 60-74 constitute nearly two-thirds of the study population. Patients aged 75- 84 constitute nearly twenty five percent of the population. Remaining by patients aged above 85.

AGE DISTRIBUTION

Age	Frequency	Percent
60-74	204	68.0
75-84	73	24.3
≥ 85	23	7.7



PREDISPOSING FACTORS FOR DELIRIUM

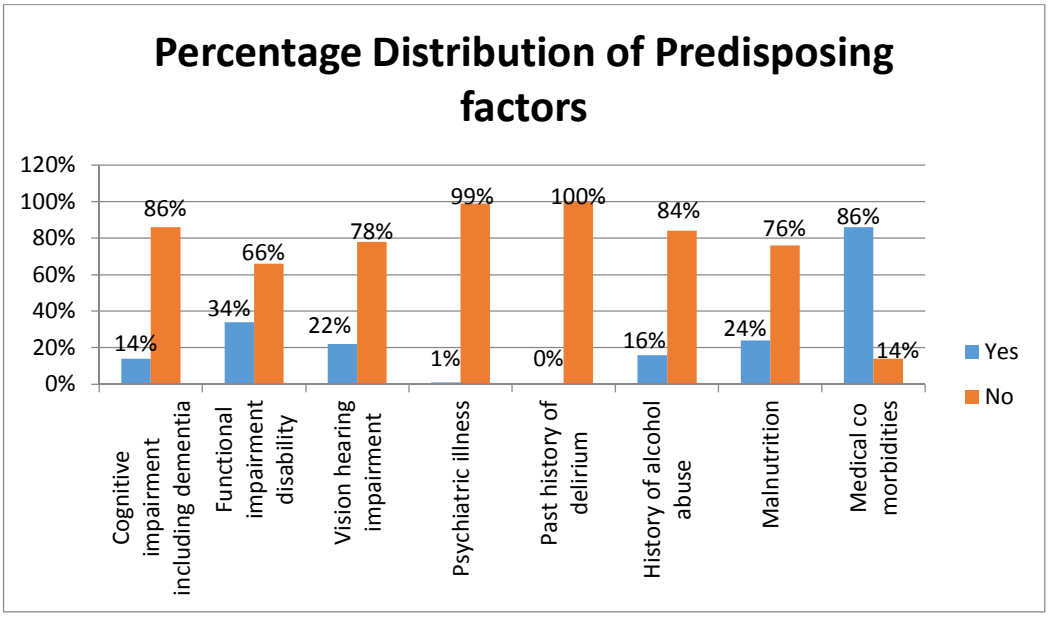
Mild cognitive impairment and dementia are common in elderly population and is a common predisposing factor for delirium and is present in almost fourteen percent of the study population. Details of cognitive status are obtained from history from the caregivers, past medical records, previous MMSE scores of the patients or from MINI-COG score during lucid intervals.

Functional impairment and special sensory impairment are present in nearly one-third and one-fifth of the patients respectively. Details on functional status are obtained from the caregivers include usage of walking aids etc and from current Barthel index. One-fourth of the patient have malnutrition as predisposing factor which is based on any of the following BMI less than eighteen, general appearance and serum protein and albumin status.

Medical co-morbidities are more common in elderly patients and are one of the most important predisposing factors in elderly. It is around eighty six percent in our study. History of alcohol abuse is observed in around sixteen percent of the patients. History of psychiatric illness is less than 1 percent and no patients was with past history of delirium were observed in this study.

PREDISPOSING FACTORS FOR DELIRIUM

Predisposing factors		Count	Percent
Cognitive impairment including dementia	No	257	85.7%
	Yes	43	14.3%
Functional impairment & disability	No	199	66.3%
	Yes	101	33.7%
Vision/ hearing impairment	No	235	78.3%
	Yes	65	21.7%
Psychiatric illness	No	299	99.7%
	Yes	1	0.3%
Past history of delirium	No	300	100.0%
	Yes	0	0.0%
History of alcohol abuse	No	253	84.3%
	Yes	47	15.7%
Malnutrition	No	228	76.0%
	Yes	72	24.0%
Medical co-morbidities	No	41	13.7%
	Yes	259	86.3%

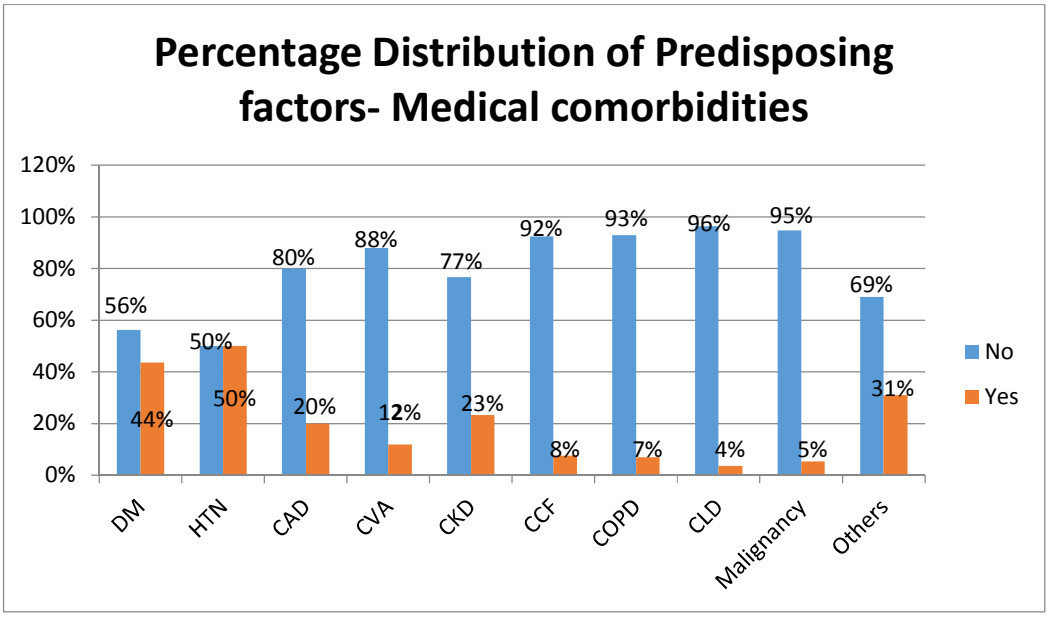


PREDISPOSING FACTORS- MEDICAL CO MORBIDITIES

Though multiple medical problems are common in elderly people, Systemic hypertension is the most common medical co morbidity in our study followed by Diabetes mellitus. Chronic kidney disease and coronary artery disease are seen in one-fifth of the study population. Cerebrovascular accident includes both infarct and hemorrhage is seen in twelve percent of the patients. Congestive cardiac failure and chronic obstructive pulmonary disease are observed in seven percent of the elderly patients in this study. Chronic liver disease and malignancy are seen in five percent of the patients each. Other medical comorbidites seen in elderly patients in this study includes Hypothyroidism, anemia, pulmonary tuberculosis etc.

PREDISPOSING FACTORS- MEDICAL CO MORBIDITIES

Medical co morbidities		COUNTS	PERCENT
Diabetes mellitus	No	169	56.3%
	Yes	131	43.7%
Systemic hypertension	No	150	50.0%
	Yes	150	50.0%
Coronary artery disease	No	240	80.0%
	Yes	60	20.0%
Cerebrovascular accident	No	264	88.0%
	Yes	36	12.0%
Chronic kidney disease	No	230	76.7%
	Yes	70	23.3%
Congestive cardiac failure	No	277	92.3%
	Yes	23	7.7%
Chronic obstructive pulmonary disease	No	279	93.0%
	Yes	21	7.0%
Chronic liver disease	No	289	96.3%
	Yes	11	3.7%
Malignancy	No	284	94.7%
	Yes	16	5.3%
Others	No	207	69.0%
	Yes	93	31.0%



AGE WISE DISTRIBUTION OF PREDISPOSING FACTORS

Nearly more than half of the delirious patients with cognitive impairment are aged 60- 74. Functional impairment and disability in any of the basic daily activities is an important predisposing factor for delirium is common among all the three age groups and is statistically significant.

Special sensory impairment includes visual impairment and hearing impairment. Special sensory impairment is common in all the three age groups and is statistically significant. History of psychiatric illness is uncommon in our study. History of alcohol abuse is more among delirious elderly patients aged 60- 74 which is almost seventy eight percent.

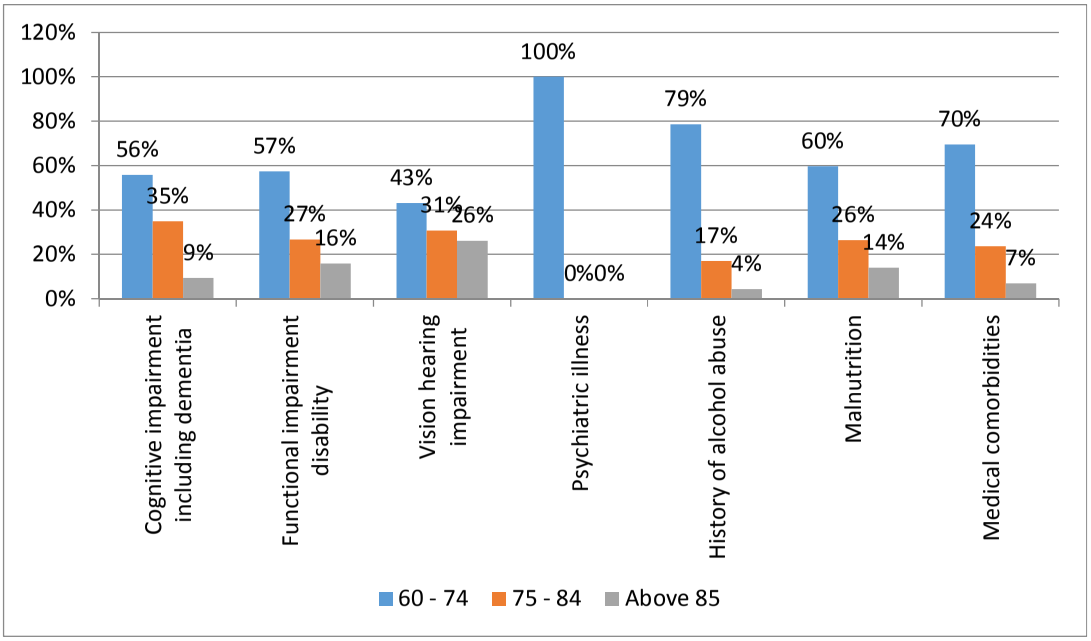
Nearly sixty percent of delirious patients with malnutrition are aged 60- 74 in this study. Medical co morbidities are more common in elderly delirious

patients. In our study there is high prevalence of medical co morbidities in delirious patients who are aged 60- 74, which is almost seventy percent.

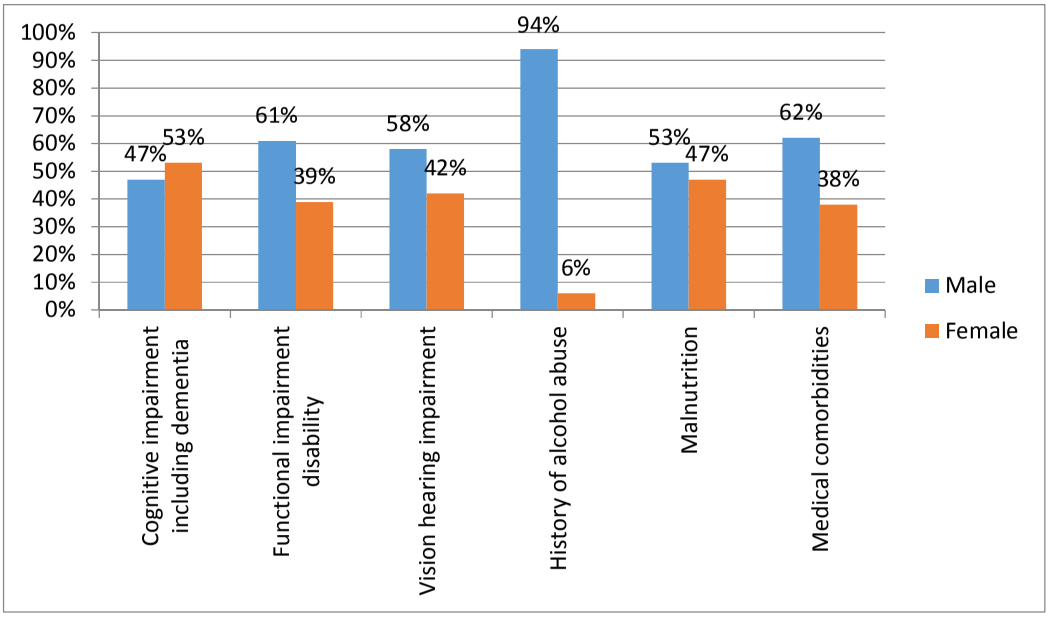
AGE WISE DISTRIBUTION OF PREDISPOSING FACTORS

Predisposing factors	**Age group**						**P value**
	60 – 74		**75 - 84**		**Above 85**		
	No	**%**	**No**	**%**	**No**	**%**	
Cognitive impairment including dementia	24	55.8	15	34.9	4	9.3	0.168
Functional impairment disability	58	57.4	27	26.7	16	15.8	p<0.001
Vision hearing impairment	28	43.1	20	30.8	17	26.2	p<0.001
Psychiatric illness	1	100	0	0	0	0	0.790
History of alcohol abuse	37	78.7	8	17.0	2	4.3	0.222
Malnutrition	43	59.7	19	26.4	10	13.9	0.052
Medical co morbidities	180	69.5	61	23.6	18	6.9	0.306

AGE WISE DISTRIBUTION OF PREDISPOSING FACTORS



SEX WISE DISTRIBUTION OF PREDISPOSING FACTORS



SEX WISE DISTRIBUTION OF PREDISPOSING FACTORS

Cognitive impairment is almost equal both sexes though female patients have prevalence of fifty three percent in this study. Both sexes with alcohol abuse have increased risk of delirium is statistically significant. Functional impairment, special sensory impairment, malnutrition and medical co morbidities causing delirium is more common among males when compared to females in this study

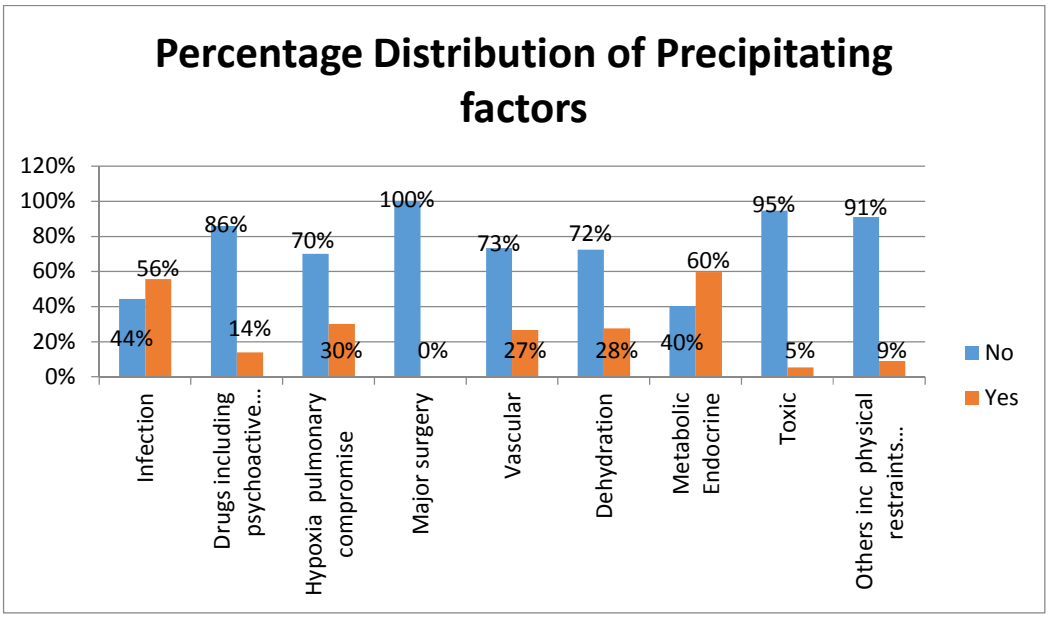
SEX WISE DISTRIBUTION OF PREDISPOSING FACTORS

Precipitating factors	Sex				P value
	Male		Female		
	No	%	No	%	
Cognitive impairment including dementia	20	47	23	53	0.045
Functional impairment & disability	62	61	39	39	0.791
Vision hearing impairment	38	58	27	42	0.727
History of alcohol abuse	44	94	3	6	p<0.001
Malnutrition	38	53	34	47	0.133
Medical co morbidities	161	62	98	38	0.104

PRECIPITATING FACTORS FOR DELIRIUM

Metabolic abnormalities are being the most common precipitating factor for delirium in this study, with more than three-fifth of the study population has metabolic disturbance as precipitating factors. It is followed by infection which is around fifty five percent.

Nearly more than one fourth of the study population has hypoxia, vascular events and dehydration as precipitating factors. Other less common precipitating factors for delirium in this study includes toxic causes like adverse effects of medications substance withdrawal state like alcohol withdrawal, fecal impaction, sleep deprivation, pain, indwelling catheters. Drugs including psychoactive medications, sedative hypnotics and polypharmacy as precipitating factors are seen in fourteen percent of the study population.



PRECIPITATING FACTORS FOR DELIRIUM

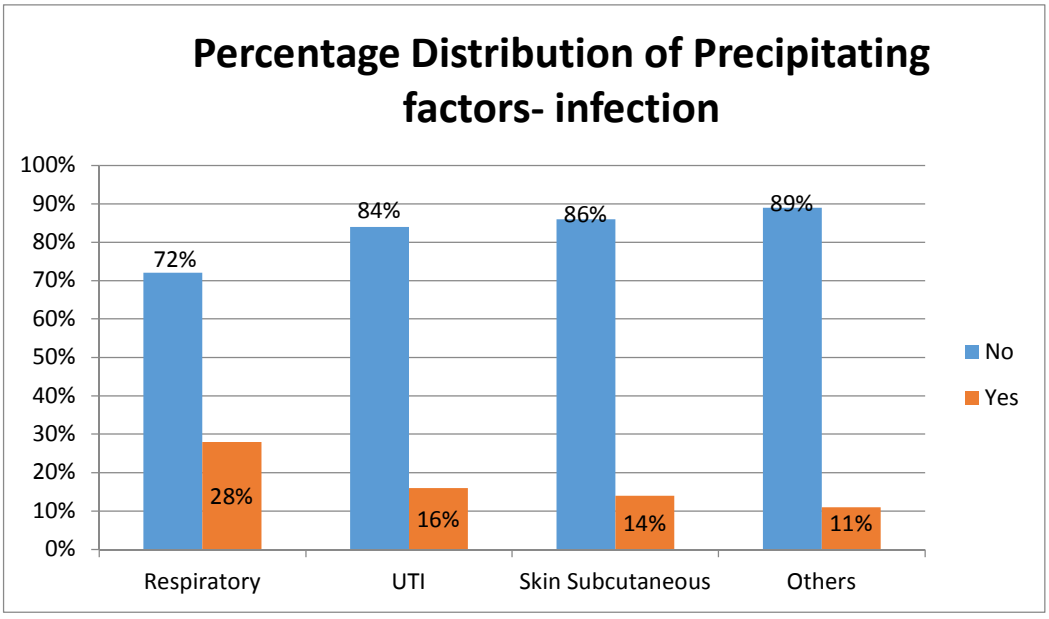
Precipitating factors		Count	Percent
Infection	No	133	44.3%
	Yes	167	55.7%
Drugs including psycho actives, sedatives and polypharmacy	No	258	86.0%
	Yes	42	14.0%
Hypoxia pulmonary compromise	No	210	70.0%
	Yes	90	30.0%
Major surgery	No	300	100.0%
	Yes	0	0.0%
Vascular	No	220	73.3%
	Yes	80	26.7%
Dehydration	No	217	72.3%
	Yes	83	27.7%
Metabolic Endocrine	No	121	40.3%
	Yes	179	59.7%
Toxic	No	284	94.7%
	Yes	16	5.3%
Others inc physical restraints indwelling catheter	No	273	91.0%
	Yes	27	9.0%

PRECIPITATING FACTOR- INFECTIONS

Among the infections respiratory infection being the most common infection as precipitating factor followed by urinary tract infection and skin and subcutaneous infections.

PRECIPITATING FACTOR- INFECTIONS

Infections		Count	Percent
Respiratory	No	217	72.3%
	Yes	83	27.7%
UTI	No	251	83.7%
	Yes	49	16.3%
Skin Subcutaneous	No	256	85.6%
	Yes	43	14.4%
Others	No	267	89.0%
	Yes	33	11.0%

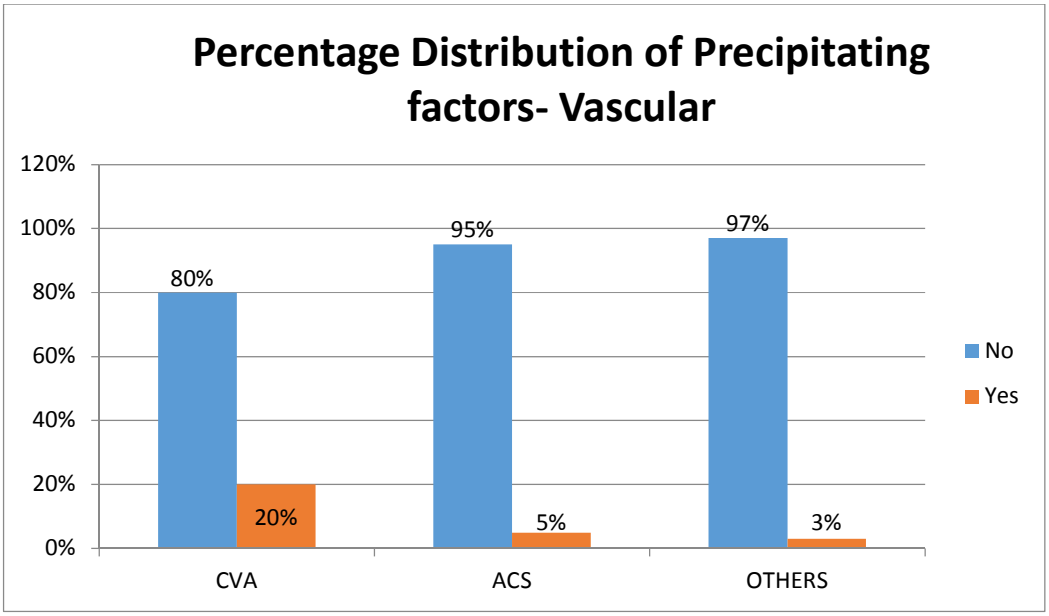


PRECIPITATING FACTORS- VASCULAR EVENTS

Cerebrovascular accident is being the leading cause among vascular events causing delirium in this study followed by acute coronary syndrome.

PRECIPITATING FACTORS- VASCULAR EVENTS

Vascular events		Count	Percent
Cerebrovascular events	No	239	79.7%
	Yes	61	20.3%
Acute coronary syndromes	No	284	94.7%
	Yes	16	5.3%
Others	No	290	96.7%
	Yes	10	3.3%

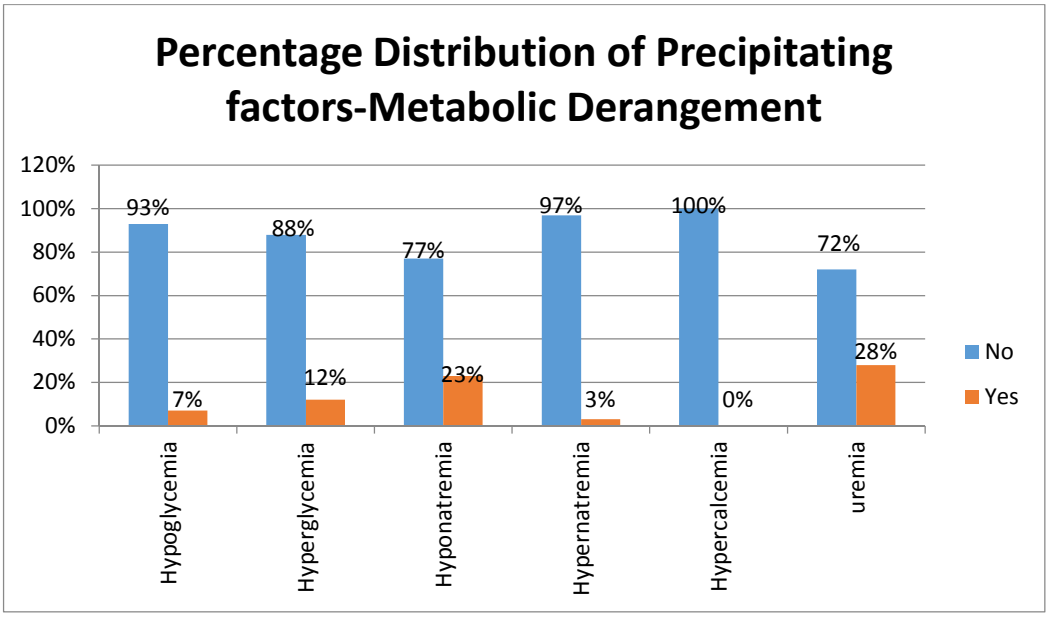


PRECIPITATING FACTORS- METABOLIC DERANGEMENT

Uremia is the most common precipitating factor among metabolic factors in this study, which is around twenty eight percent. It is followed by hyponatremia, twenty three percent. Others metabolic causes include hyperglycemia which is seen in eleven percent of the cases, hypoglycemia which is around seven percent of the cases of delirium in this study.

PRECIPITATING FACTORS- METABOLIC DERANGEMENT

Metabolic factors		Count	Percent
Hypoglycemia	No	279	93.0%
	Yes	21	7.0%
Hyperglycemia	No	265	88.3%
	Yes	35	11.7%
Hyponatremia	No	231	77.0%
	Yes	69	23.0%
Hypernatremia	No	292	97.3%
	Yes	8	2.7%
Hypercalcemia	No	300	100.0%
	Yes	0	0.0%
Uremia	No	215	71.7%
	Yes	85	28.3%



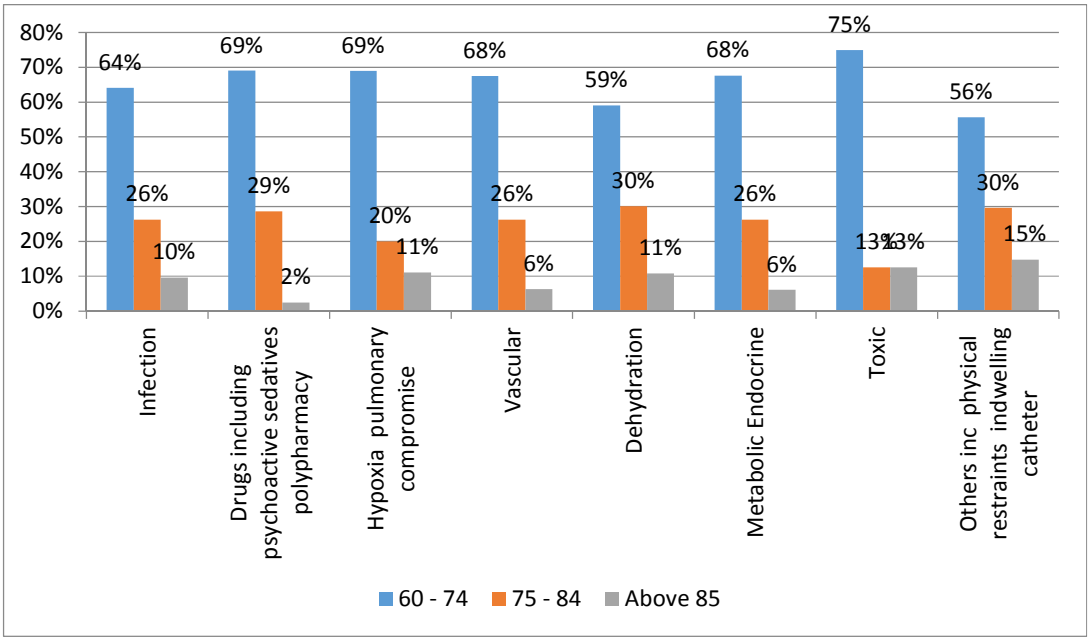
AGE WISE DISTRIBUTION OF PRECIPITATING FACTORS

Infections are more prevalent in patients age group of 60- 74, which is nearly two-thirds of the patients in this study. Among the infections, two-thirds of respiratory infections have occurred in patients aged 60- 74. Sixty nine percent of acute vascular events occurred in patients age group of 60-74 in this study. Drugs as a causative agent for delirium have occurred more commonly in patients in age group of 60- 74 which is followed by 75- 84 and ≥ 85 age groups. Acute vascular events including cerebrovascular accidents and acute coronary syndrome and metabolic derangement occurred in nearly two-thirds of the patients aged 60-74 years in this study. Toxic causes as precipitating factors have occurred in three fourth of the patients in 60- 74 years age group remaining in other age groups.

AGE WISE DISTRIBUTION OF PRECIPITATING FACTORS

Precipitating factors	Age group						P value
	60 - 74		75 – 84		Above 85		
	Count	Percent	Count	Percent	Count	Percent	
Infection	107	64.1	44	26.3	16	9.6	.194
Drugs including psychoactive, sedatives, polypharmacy	29	69.0	12	28.6	1	2.4	.342
Hypoxia & pulmonary compromise	62	68.9	18	20.0	10	11.1	.223
Major surgery	0	0	0	0	0	0	
Vascular	54	67.5	21	26.3	5	6.3	.797
Dehydration	49	59.0	25	30.1	9	10.8	.108
Metabolic Endocrine	121	67.6	47	26.3	11	6.1	.363
Toxic	12	75.0	2	12.5	2	12.5	.447[a]
Others inc. physical restraints indwelling catheter	15	55.6	8	29.6	4	14.8	.224

AGE WISE DISTRIBUTION OF PRECIPITATING FACTORS



SEX WISE DISTRIBUTION OF PRECIPITATING FACTORS

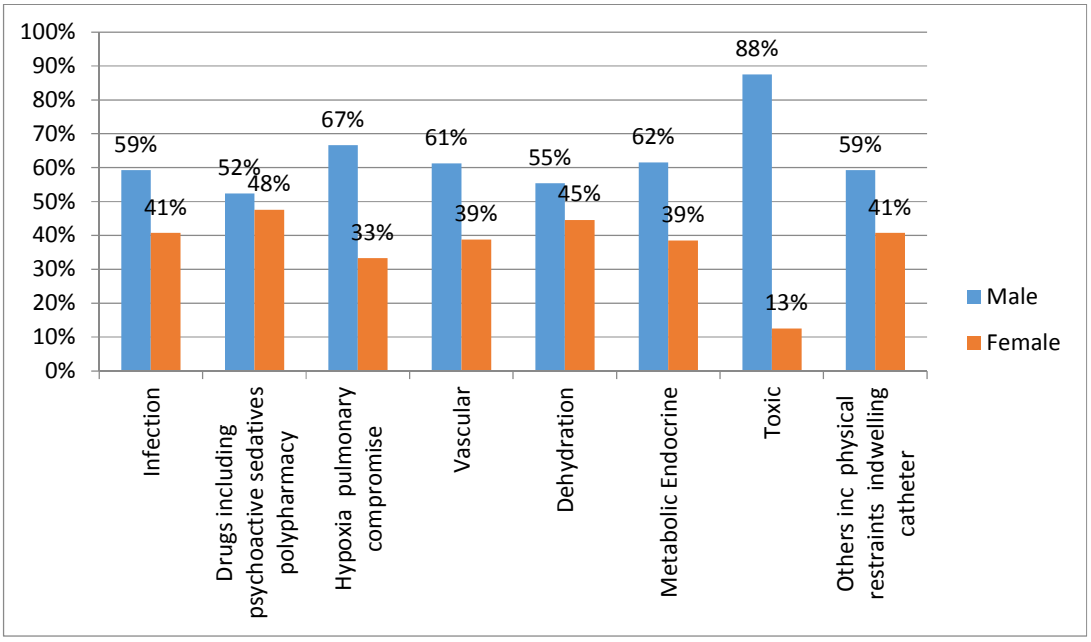
Infection is common among males as precipitating factors when compared to females in our study. Toxic causes like drug or alcohol withdrawal is highly prevalent among males and is statistically significant. Drugs including psychoactive medications, sedative hypnotics and polypharmacy are almost equally prevalent in both sexes.

Hypoxia including pulmonary compromise, dehydration, vascular events, and metabolic events all are highly prevalent in males in our study. Other precipitating factors like indwelling catheters, physical restraints, pain, sleep deprivation all are common in males.

SEX WISE DISTRIBUTION OF PRECIPITATING FACTORS

Precipitaing factors	Sex				P value
	Male		Female		
	Count	Percent	Count	Percent	
Infection	99	59.3%	68	40.7%	.676
Drugs including psychoactive sedatives polypharmacy	22	52.4%	20	47.6%	.256
Hypoxia pulmonary compromise	60	66.7%	30	33.3%	.142
Vascular	49	61.2%	31	38.8%	.845
Dehydration	46	55.4%	37	44.6%	0.282
Metabolic Endocrine	110	61.5%	69	38.5%	0.630
Toxic	14	87.5%	2	12.5%	0.022*
Others inc. physical restraints indwelling catheter	16	59.3%	11	40.7%	0.905

SEX WISE DISTRIBUTION OF PRECIPITATING FACTORS



SUBTYPES OF DELIRIUM

Among the three subtypes hypoactive delirium is more prevalent in our study seen in almost fifty six percent of the patients, which is followed by mixed delirium, twenty seven percent and hyperactive delirium, sixteen percent of study population in our study.

HYPOACTIVE DELIRIUM

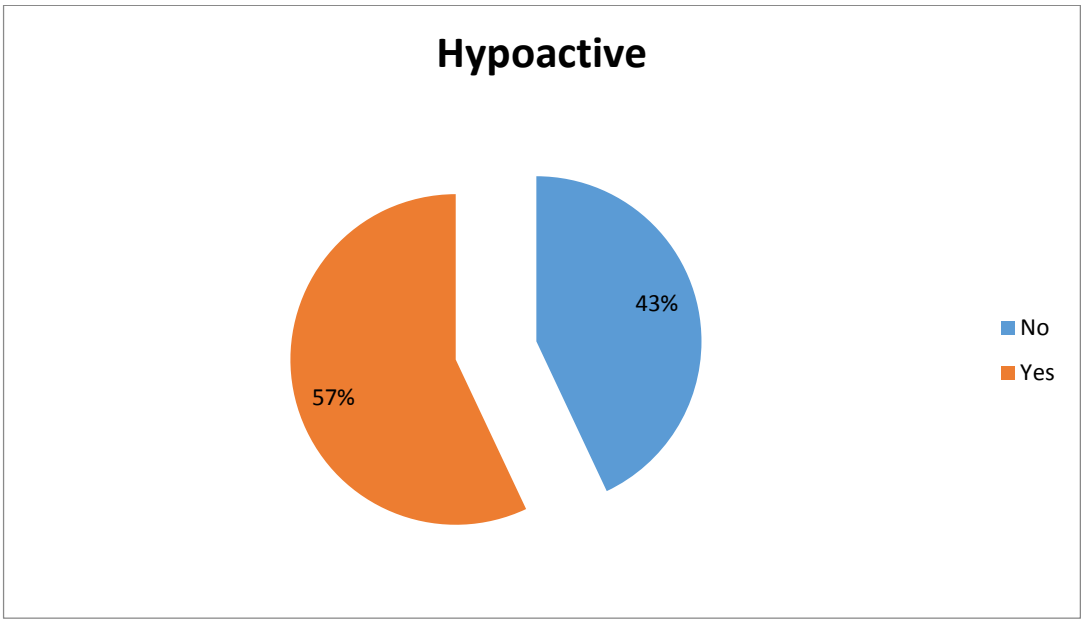
Hypoactive	Frequency	Percent
No	130	43.3
Yes	170	56.7
Total	300	100.0

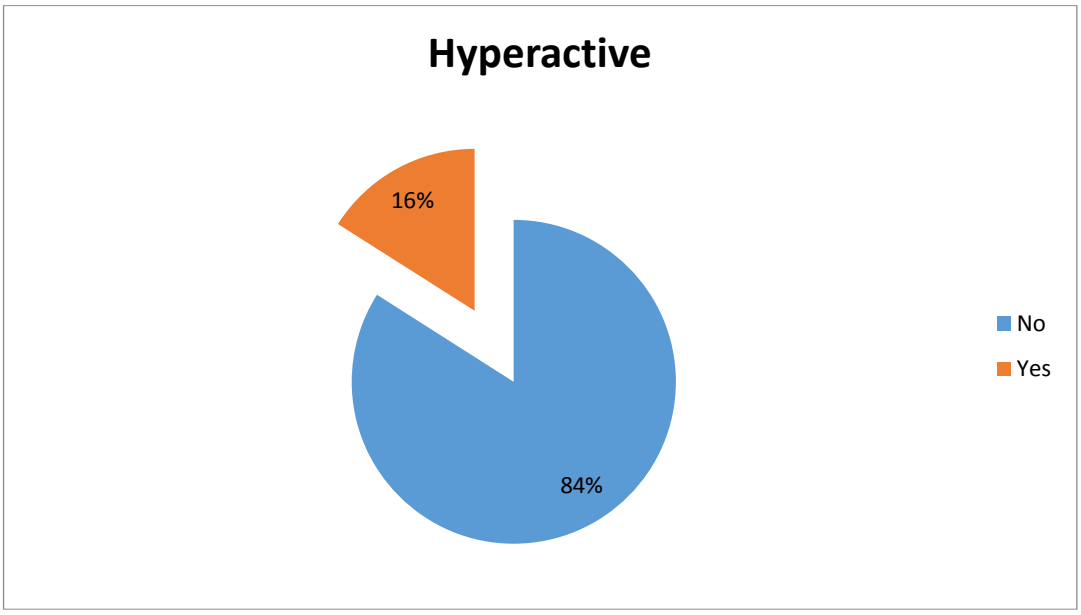
HYPERACTIVE DELIRIUM

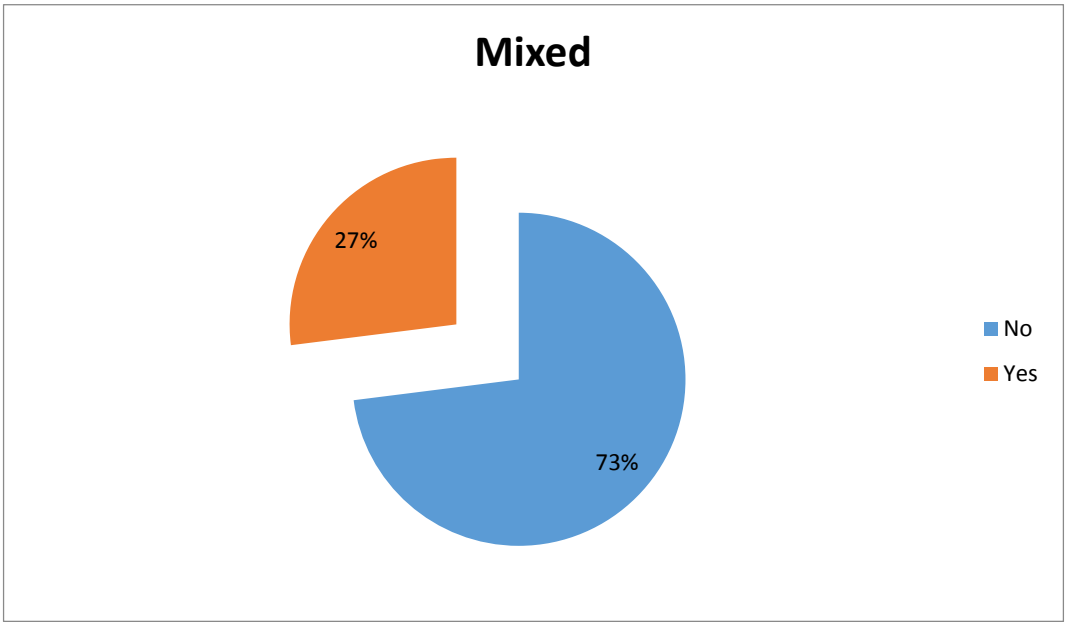
Hyperactive	Frequency	Percent
No	251	83.7
Yes	49	16.3
Total	300	100.0

MIXED DELIRIUM

Mixed	Frequency	Percent
No	219	73.0
Yes	81	27.0
Total	300	100.0




Hyperactive
16%
84%
No
Yes


Mixed
27%
73%
No
Yes

SUBTYPES BASED ON PREDISPOSING FACTORS

Among the patients with cognitive impairment as predisposing factors nearly sixty percent has hypoactive delirium in our study. Similarly among patients with functional impairment and disability as risk factors hypoactive delirium is common.

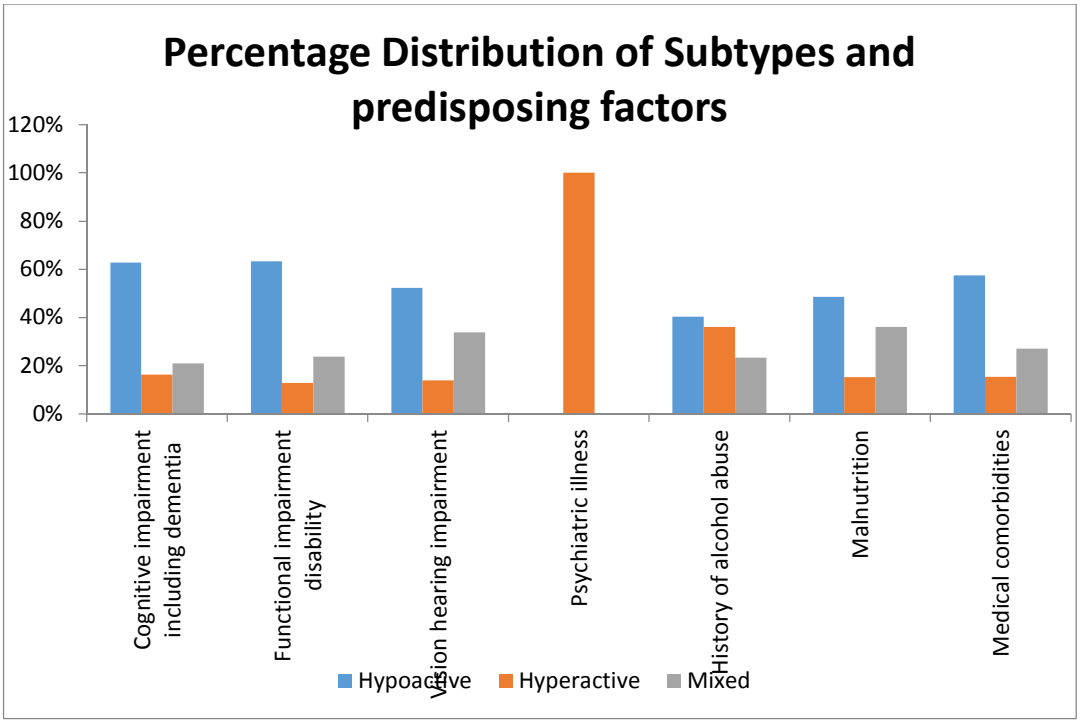
Nearly fifty percent of the patients with special sensory impairment as predisposing factor have hypoactive delirium. Hypoactive is more prevalent in patients with alcohol abuse as risk factor followed by hyperactive and then mixed delirium.

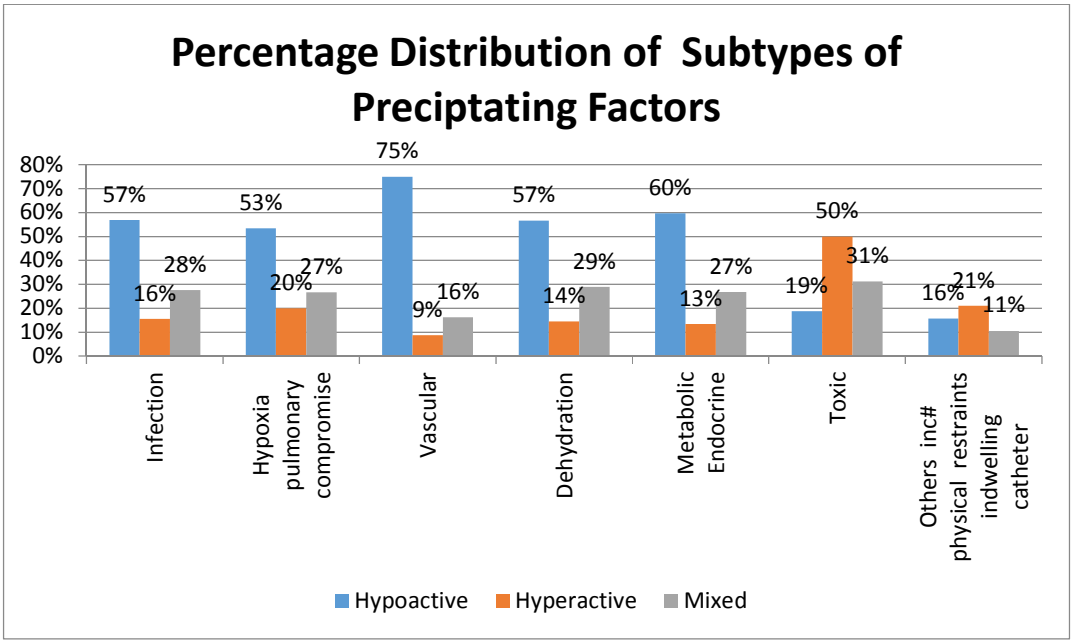
Hypoactive delirium is more common among patients with malnutrition and medical co morbidities which is followed by mixed delirium and hyperactive delirium. Since number of patients with prior history of psychiatric illness is only one, subtype more prevalent could not be studied.

SUBTYPES BASED ON PRECIPITATING FACTORS

Infections, dehydration and metabolic derangement cause hypoactive delirium in nearly three fifth of the cases with each as precipitating factors followed by mixed and hyperactive delirium. Hypoactive delirium is more common among patients with acute vascular events as risk factors. Hypoxia causes hypoactive delirium in nearly fifty percent of patients.

Hyperactive delirium is more prevalent in patients with toxic causes like drugs or alcohol withdrawal state and others causes like physical restraints, indwelling catheters, painful stimuli etc.,





SUBTYPES BASED ON PREDISPOSING FACTORS

		Hypoactive				Hyperactive				Mixed			
		No		Yes		No		Yes		No		Yes	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Cognitive impairment including dementia	Yes	16	37.3	27	62.7	36	83.7	7	16.3	34	79.1	9	20.9
Functional impairment & disability	Yes	37	36.7	64	63.3	88	87.1	13	12.9	77	76.2	24	23.8
Vision/ hearing impairment	Yes	31	47.7	34	52.3	56	86.1	9	13.9	43	66.1	22	33.9
Psychiatric illness	Yes	1	100	0	0.0	0	0.0	1	100	1	100	0	0.0
Past history of delirium	Yes	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
History of alcohol abuse	Yes	28	59.5	19	40.5	30	63.8	17	36.2	36	76.5	11	23.5
Malnutrition	Yes	37	51.3	35	48.7	61	84.7	11	15.3	46	63.8	26	36.2
Medical co morbidities	Yes	110	42.5	149	57.5	219	84.5	40	15.5	189	73	70	27

SUBTYPES BASED ON PRECIPITATING FACTORS

		Hypoactive				Hyperactive				Mixed			
		No		Yes		No		Yes		No		Yes	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Infection	Yes	72	43.1	95	56.9	141	84.4	26	15.6	121	72.4	46	27.6
Drugs inc. psychoactives sedatives & polypharmacy	Yes	23	54.7	19	45.3	35	83.3	7	16.7	26	69	16	31
Hypoxia & pulmonary compromise	Yes	42	46.6	48	53.4	72	80	18	20	66	73.3	24	26.7
Major surgery	Yes	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Vascular	Yes	20	25	60	75	73	91.2	7	8.8	67	83.7	13	16.3
Dehydration	Yes	36	43.3	47	56.7	71	85.5	12	14.5	59	71	24	29
Metabolic/ Endocrine	Yes	72	40.2	107	59.8	155	86.5	24	13.5	131	73.1	48	23.9
Toxic	Yes	13	81.2	3	18.8	8	50	8	50	11	68.7	5	31.3
Others inc. Physical restraints/ indwelling catheter	Yes	18	66.7	9	33.3	15	55.5	12	44.5	21	77.7	6	22.3

DISCUSSION

DISCUSSION

This study was conducted to analyze various predisposing factors, precipitating factors and subtypes of delirium which is prevalent in hospitalized elderly patients.

Fortini et al. in their analysis on relationship between predisposing risk factors and incident delirium has found an independent association between delirium and male gender with odds ratio of 2.187.(46) Inouye et al. has identified male sex as one of the predisposing factor for delirium.(14) Male gender is associated with agitated delirium in study by Nagese et al. (47) Kim et al. in their study has more percent of males with delirium.(48) Similarly in this study nearly twenty percent difference in sex distribution is observed.

Age of 65 years and above is identified as one of the predisposing factors for delirium.(14) Age is the most significantly associated predisposing factor for the development of delirium in patients admitted in surgical wards for more than five days.(49) The prevalence of delirium in the community increases with age, rising to 14 per cent among individuals older than 85 yr.(6) A study from India has identified higher age as predisposing factor for delirium in intensive care unit patients.(7) In our study patients aged 60 to 74 constituted nearly two-thirds of the study population when compared with patients in group 75- 84 and ≥ 85. Most

studies on epidemiology were done in developed countries where life expectancy is high when compared to our country which is 68.56 years in 2016 which can influence difference in age distribution in our study. Other factors which can influence the difference in distribution include logistics reasons to attend hospital, hospital admissions, social factors, referrals etc.

PREDISPOSING FACTORS:

Various studies which prospectively validated prediction models for delirium across different clinical settings have identified dementia and cognitive impairment as predisposing factor with relative risk of 2·3–4·7 and 2·1–2·8 respectively.(11) Prevalence of delirium in dementia patients ranges between 22% and 89%.(30) In this study prevalence of delirium in demented and cognitively impaired elderly patients is around fourteen percent and is more prevalent in patients in age group of 60- 74 and in females. Since it is a cross sectional study we rely mostly on history from the caregivers and previous medical records for history of dementia and cognitive impairment. Only some patients in lucid interval were assessed for cognitive impairment using MINI COG. This explains the less prevalence of dementia and cognitive impairment as predisposing factor for delirium in our study.

One of the leading risk factor identified at admission in both medical and non-cardiac surgery patients is functional impairment & disability with relative risk of 4.0.(11) A Katz Activities of Daily Living (ADL) of ≤ 4 is

independently associated with presenting with delirium in the emergency department.(50) Functional impairment is seen in nearly one third of the study population and is common in male patients and in all the three age groups and is statistically significant..

Elie et al in their study identified hearing impairment and visual impairment as risk factors for delirium with odds ratio of 1.9 and 1.7 respectively.(51) In our study special sensory impairment is seen in one fifth of the patients. Special sensory impairment is common in all the three age groups and is statistically significant.

Past history of delirium is an important predisposing factor for development of delirium in postoperative patients with odds ratio of 4.1(52) similarly in non cardiac surgery patients with relative risk of 3.0.(11) In our study there is no patient with past history of delirium. Psychiatric illness including dementia is one of the predisposing factor for delirium with odds ratio of 1.9.(51) History of psychiatric illness is seen in less than 1 percent of the study population.

Another risk factor consistently observed at admission in both medical and non-cardiac surgery patients is history of alcohol misuse with risk ratio of 5·7.(11) Similarly Elie et al in a study has found alcohol abuse as predisposing factor with odds ratio of 3.3. (51) Use of alcohol more than 3 units per day (OR of 3.23)is associated with increased risk of delirium.(9) History of alcohol abuse is observed in around sixteen percent of the study

patients. Both sexes have increased risk for delirium when they have alcohol abuse as risk factor and it is statistically significant.

Malnutrition with Mini nutritional assessment score <17, is a predisposing factor for delirium is seen in nearly 35.6% patients in a study.(53) In our study malnutrition is seen in one fourth of the study population as a predisposing factor. Malnutrition is almost equally seen in both sexes.

Co morbid medical illness/ severe illness is a predisposing factor for delirium with risk ratio of 3.5.(8) Co morbidity burden or presence of specific co morbidities (eg, stroke, depression) were associated with an increased risk in all populations(11) In our study it is prevalent in 86 percent of the study population. Stroke history and hypertension are important risk factors for the delirium in surgical patients.(54) Hypertension is a important risk factors for the delirium medical subgroup in a study by Lee et al.(54) Similarly in our study systemic hypertension is most prevalent medical co morbidity followed by diabetes as predisposing factor. Old stroke as a predisposing medical co morbidity is seen in 12% of the patients.

PRECIPITATING FACTORS:

In medical patients, polypharmacy, use of psychoactive drugs, and physical restraints were the leading factors, conferring as much as four and half times increased risk. (11) More than three medications is a

precipitating factor with relative risk of 2.9.(8) Drugs including psychoactive medications, sedative hypnotics and polypharmacy as precipitating factors are seen in fourteen percent of the study population.

Sepsis associated delirium is the most common form of delirium in the ICU and is seen in about 50% of septic patients.(18) Infection is a precipitating factor for delirium in ICU patients with relative risk of 3.1. (11) In our study sepsis is seen in 55% of the study population as precipitating factors. Infections as precipitating factor for delirium are more prevalent in patients age group of 60- 74 and in males. Among the infections respiratory infection being the most common infection as precipitating factor followed by urinary tract infection and skin and subcutaneous infections.

Hypoxia (SaO_2 <90%) is found to be a significant precipitating factor for delirium ($P = 0.007$) in a study by jayaswal et al. Cerebral hypoxia, in early stages present as hypoactive or mixed subtype of delirium.(55) Hypoxia or pulmonary compromise as a risk factor for delirium is seen in thirty percent of the study population.

The cause of dehydration is multi-factorial, is both a predisposing and precipitating factor for delirium (56) Dehydration is observed as precipitating factor in 26.4% of the patients with delirium in a study.(57) One fourth of the patients in our study have dehydration as precipitating factor.

Vascular events including stroke, acute myocardial infarction, critical limb ischemia, pulmonary embolism, heart failure, arterial emboli of upper arm occurred in 37.9% of the patients in a study (58) In this study we have observed more than one fourth of the study patients with vascular events as risk factor for delirium, among which stroke being the most common cause for delirium. Toxic causes like adverse effects of medications, substance withdrawal state like alcohol withdrawal is seen in sixteen patients.

Inouye et al in a study on hospitalized elderly patients- among the precipitating factors like use of physical restraints with relative risk of 4.4, indwelling bladder catheter with relative risk of 2.4 and any iatrogenic events with relative risk of 1.9 for delirium.(59) In medical patients use of physical restraints are the leading factors, conferring as much as a four-and-a-half-times increased risk.(11) In our study other factors including physical restraints and indwelling catheter is observed in nine percent of the patients as triggering factors.

Metabolic conditions as triggering factor for delirium is observed in 43.7% of the patients and it includes dehydration with electrolyte imbalance, SIADH, hyperthyroidism, Addison's disease, hypercalcaemia, severe anaemia, rhabdomyosis.(58) water and electrolyte disturbance as precipitating factor is observed at 36.5% of patients at first assessment and in 45.7% patients at final assessment in a study by Magny et al(57) Increased serum urea is a triggering factor with relative risk of 5.1.(11)

Uremia is the most common precipitating factor among metabolic factors in this study which is around twenty eight percent followed by hyponatremia which is twenty three percent. Metabolic abnormalities are more common in males when compared to females as triggering factor for delirium in our study.

SUBTYPES:

In an empirical study on delirium subtypes by Liptzin et al in 1992 on patients with delirium, (15%) were rated as only hyperactive,(19%) were only hypoactive,(52%) had a mixed picture, and (l4%) had neither hyper- nor hypoactivity.(21) Nearly half the patients had hypoactive psychomotor activity, and almost one third did not have disturbed psychomotor activity (normal) and the remaining proportion almost equally comprised hyperactive and mixed subtypes in a study (23) The most common subtype of delirium was hypoactive (45.33%), followed by hyperactive (37.33%) and few patients had mixed subtype of delirium (17.33%) in a study by Sharma et al in North India.(7) The majority (92.0%) delirious emergency department patients had the hypoactive subtype of delirium in a study.(50). The most frequent delirium subtype was the hypoactive delirium followed by the mixed, hyperactive and non-motor subtype of delirium in a study by Morandi et al.(24).

Among the three subtypes, hypoactive delirium is more prevalent in our study seen in almost one hundred and seventy patients, which is followed by

mixed delirium almost more than one fourth of the patients and hyperactive delirium in sixteen percent of the patients in our study.

Dementia was associated with all three delirium motor subtypes (hyperactive- OR 3.3, hypoactive- OR 2.8, mixed OR- 2.6), atypical antipsychotics with hypoactive delirium (OR 0.23) and intravenous lines with mixed delirium (OR 2.9).(24) Among the patients with cognitive impairment as predisposing factors nearly sixty percent has hypoactive delirium in our study. Similarly among patients with functional impairment and disability as risk factors hypoactive delirium is common. Nearly fifty percent of the patients with special sensory impairment as predisposing factor have hypoactive delirium.

Males had higher scores on motor agitation and affective lability (behavioral), whereas females had a higher frequency of hypoactive delirium in a study by Trzepacz et al.(60). It is known that hypoactive delirium is caused by infections, hypoxia, hepatic and renal failures, hypothermia, hyperglycaemia, and thyroid diseases etc.(61) Infections, dehydration and metabolic abnormalities each as precipitating factors cause hypoactive delirium in nearly three fifth of the cases in this study. Hypoactive delirium is more common among patients with acute vascular events as risk factors. Hypoxia causes hypoactive delirium in nearly fifty percent of patients in our study.

Hyperactive delirium is often associated with the adverse effects of anticholinergic drugs, drug intoxication and withdrawal states.(61) Hyperactive delirium is more prevalent in patients with toxic causes like drugs or alcohol withdrawal state and others causes like physical restraints, indwelling catheters, painful stimuli etc. in our study.

CONCLUSION

CONCLUSION

1. Majority of the subjects in this study are male and in the age group of 60 to 74 years.
2. Delirium is often multi-factorial with multiple predisposing and precipitating factors.
3. Medical co morbidities were the single most common predisposing factor for delirium which is followed by functional impairment and malnutrition. Among the medical co morbidities, systemic hypertension is the most common condition as predisposing factor associated with delirium followed by Diabetes mellitus, chronic kidney disease, coronary artery disease and cerebrovascular accident.
4. Cognitive impairment is less prevalent in this study as predisposing factor. Functional impairment and special sensory impairment including vision and hearing as predisposing factors are prevalent in all the three age groups and it is statistically significant. History of alcohol abuse is prevalent in both sex and is a statistically significant predisposing factor.
5. Metabolic abnormalities are being the most common precipitating factor for delirium in this study followed by infections. Uremia is the most common precipitating factor among metabolic factors in this study followed by hyponatremia. Drugs including psychoactive

medications, sedative hypnotics and polypharmacy are less prevalent as precipitating factors for delirium in our study.

6. Respiratory and urinary tract infections account for nearly two-third of infections as precipitating factors.
7. Vascular events, hypoxia and dehydration each occurs in one fourth of study patients as precipitating factor. Cerebrovascular accidents being the leading cause among vascular events causing delirium in this study which is followed by acute coronary syndrome.
8. Toxic causes like substance withdrawal, alcohol withdrawal state are statistically significant precipitating factor delirium in both sexes.
9. Among the three subtypes, hypoactive delirium is more prevalent in our study seen in 56.7% of patients, which is followed by mixed delirium seen in 27% of the patients and hyperactive delirium 16.3% of study population in our study.
10. Predisposing factors like cognitive impairment, functional impairment, and special sensory impairment are associated with high prevalence of hypoactive delirium.
11. Infections, dehydration and metabolic derangements cause hypoactive delirium in nearly three fifth of the cases with each as precipitating factors. Hypoactive delirium is common in patients with vascular events as precipitating factors in our study.

12. Hyperactive delirium is more prevalent in patients with toxic causes like drugs or alcohol withdrawal state and others causes like physical restraints, indwelling catheters, painful stimuli etc. in our study.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Morandi A, Pandharipande P, Trabucchi M, Rozzini R, Mistraletti G, Trompeo AC, et al. Understanding international differences in terminology for delirium and other types of acute brain dysfunction in critically ill patients. Intensive Care Med. 2008 Oct;34(10):1907–15.

2. World Health Organization. International statistical classification of diseases and related health problems. 2016.

3. Organization WH. The ICD-10 classification of mental and behavioural disorders : clinical descriptions and diagnostic guidelines [Internet]. World Health Organization; 1992 [cited 2019 Sep 1]. Available from: https://apps.who.int/iris/handle/10665/37958

4. American Psychiatric Association, American Psychiatric Association, editors. Diagnostic and statistical manual of mental disorders: DSM-5. 5th ed. Washington, D.C: American Psychiatric Association; 2013. 947 p.

5. Oh ES, Fong TG, Hshieh TT, Inouye SK. Delirium in Older Persons: Advances in Diagnosis and Treatment. JAMA. 2017 Sep 26;318(12):1161.

6. Kukreja D, Günther U, Popp J. Delirium in the elderly: Current problems with increasing geriatric age. Indian Journal of Medical Research. 2015 Dec 1;142(6):655.

7. Sharma A, Malhotra S, Grover S, Jindal SK. Incidence, prevalence, risk factor and outcome of delirium in intensive care unit: a study from India. General Hospital Psychiatry. 2012 Nov;34(6):639–46.

8. Inouye SK. Predisposing and Precipitating Factors for Delirium in Hospitalized Older Patients. Dement Geriatr Cogn Disord. 1999;10(5):393–400.

9. Van Rompaey B, Elseviers MM, Schuurmans MJ, Shortridge-Baggett LM, Truijen S, Bossaert L. Risk factors for delirium in intensive care patients: a prospective cohort study. Critical Care. 2009 May 20;13(3):R77.

10. van Montfort SJT, van Dellen E, Stam CJ, Ahmad AH, Mentink LJ, Kraan CW, et al. Brain network disintegration as a final common pathway for delirium: a systematic review and qualitative meta-analysis. NeuroImage: Clinical. 2019;23:101809.

11. Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. The Lancet. 2014 Mar;383(9920):911–22.

12. Pérez-Ros P, Martínez-Arnau FM, Baixauli-Alacreu S, Caballero-Pérez M, García-Gollarte JF, Tarazona-Santabalbina F. Delirium Predisposing and Triggering Factors in Nursing Home Residents: A Cohort Trial-Nested Case-Control Study. JAD. 2019 Aug 20;70(4):1113–22.

13. Fong TG, Tulebaev SR, Inouye SK. Delirium in elderly adults: diagnosis, prevention and treatment. Nat Rev Neurol. 2009 Apr;5(4):210–20.

14. Inouye SK. Delirium in Older Persons. The New England Journal of Medicine. 2006;9.

15. Mattoo SK, Grover S, Gupta N. Delirium in general practice. INDIAN J MED RES. 2010;12.

16. van der Mast RC. Pathophysiology of Delirium. J Geriatr Psychiatry Neurol. 1998 Oct;11(3):138–45.

17. Martins S, Fernandes L. Delirium in Elderly People: A Review. Front Neur [Internet]. 2012 [cited 2019 Sep 1];3. Available from: http://journal.frontiersin.org/article/10.3389/fneur.2012.00101/abstract

18. Piva S, McCreadie V, Latronico N. Neuroinflammation in Sepsis: Sepsis Associated Delirium. CHDDT. 2015 Jan 24;15(1):10–8.

19. Alagiakrishnan K. An approach to drug induced delirium in the elderly. Postgraduate Medical Journal. 2004 Jul 1;80(945):388–93.

20. Evensen S, Bourke AK, Lydersen S, Sletvold O, Saltvedt I, Wyller TB, et al. Motor activity across delirium motor subtypes in geriatric patients assessed using body-worn sensors: a Norwegian cross-sectional study. BMJ Open. 2019 Feb;9(2):e026401.

21. Liptzin B, Levkoff SE. An Empirical Study of Delirium Subtypes. Br J Psychiatry. 1992 Dec;161(6):843–5.

22. Evensen S, Saltvedt I, Lydersen S, Wyller TB, Taraldsen K, Sletvold O. Delirium motor subtypes and prognosis in hospitalized geriatric patients – A prospective observational study. Journal of Psychosomatic Research. 2019 Jul;122:24–8.

23. Kiely DK, Jones RN, Bergmann MA, Marcantonio ER. Association Between Psychomotor Activity Delirium Subtypes and Mortality

Among Newly Admitted Postacute Facility Patients. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences. 2007 Feb 1;62(2):174–9.

24. Morandi A, Di Santo SG, Cherubini A, Mossello E, Meagher D, Mazzone A, et al. Clinical Features Associated with Delirium Motor Subtypes in Older Inpatients: Results of a Multicenter Study. The American Journal of Geriatric Psychiatry. 2017 Oct;25(10):1064–71.

25. Jackson JC, Ely EW. The Confusion Assessment Method (CAM). Int J Geriat Psychiatry. 2003 Jun;18(6):557–8.

26. Trzepacz PT. Delirium Rating Scale--Revised-98 [Internet]. American Psychological Association; 2014 [cited 2019 Sep 8]. Available from: http://doi.apa.org/getdoi.cfm?doi=10.1037/t28506-000

27. Trzepacz PT, Mittal D, Torres R, Kanary K, Norton J, Jimerson N. Validation of the Delirium Rating Scale-Revised-98: Comparison With the Delirium Rating Scale and the Cognitive Test for Delirium. J Neuropsychiatry Clin Neurosci. 2001;14.

28. Martin GC. DELIRIUM IN ELDERLY PATIENTS.

29. Fick DM, Agostini JV, Inouye SK. Delirium Superimposed on Dementia: A Systematic Review. Journal of the American Geriatrics Society. 2002 Oct;50(10):1723–32.

30. Jackson TA, Wilson D, Richardson S, Lord JM. Predicting outcome in older hospital patients with delirium: a systematic literature review: Predicting outcome in delirium. Int J Geriatr Psychiatry. 2016 Apr;31(4):392–9.

31. Bowden VM. The Journal of Neuropsychiatry and Clinical Neurosciences. JAMA. 1992 Sep 16;268(11):1473.

32. Martinez FT, Tobar C, Beddings CI, Vallejo G, Fuentes P. Preventing delirium in an acute hospital using a non-pharmacological intervention. Age and Ageing. 2012 Sep 1;41(5):629–34.

33. Marcantonio ER, Flacker JM, Wright RJ, Resnick NM. Reducing Delirium After Hip Fracture: A Randomized Trial. Journal of the American Geriatrics Society. 2001 May;49(5):516–22.

34. Hshieh TT, Yue J, Oh E, Puelle M, Dowal S, Travison T, et al. Effectiveness of Multicomponent Nonpharmacological Delirium Interventions: A Meta-analysis. JAMA Intern Med. 2015 Apr 1;175(4):512.

35. Gosch M, Nicholas JA. Pharmacologic prevention of postoperative delirium. Z Gerontol Geriat. 2014 Feb;47(2):105–9.

36. Siddiqi N, Holt R, Britton AM, Holmes J. Interventions for preventing delirium in hospitalised patients. 2009;43.

37. Wang W, Li H-L, Wang D-X, Zhu X, Li S-L, Yao G-Q, et al. Haloperidol prophylaxis decreases delirium incidence in elderly patients after noncardiac surgery: A randomized controlled trial*. Critical Care Medicine. 2012 Mar;40(3):731–9.

38. U. Prakanrattana DrSP. Efficacy of Risperidone for Prevention of Postoperative Delirium in Cardiac Surgery.pdf. 2007.

39. Su X, Meng Z-T, Wu X-H, Cui F, Li H-L, Wang D-X, et al. Dexmedetomidine for prevention of delirium in elderly patients after non-cardiac surgery: a randomised, double-blind, placebo-controlled trial. The Lancet. 2016 Oct;388(10054):1893–902.

40. Steiner LA. Postoperative delirium. Part 2: detection, prevention and treatment. European Journal of Anaesthesiology. 2011 Oct;28(10):723–32.

41. van den Boogaard M, Slooter AJC, Brüggemann RJM, Schoonhoven L, Beishuizen A, Vermeijden JW, et al. Effect of Haloperidol on Survival Among Critically Ill Adults With a High Risk of Delirium: The REDUCE Randomized Clinical Trial. JAMA. 2018 Feb 20;319(7):680.

42. Page VJ, Ely EW, Gates S, Zhao XB, Alce T, Shintani A, et al. Effect of intravenous haloperidol on the duration of delirium and coma in critically ill patients (Hope-ICU): a randomised, double-blind, placebo-controlled trial. The Lancet Respiratory Medicine. 2013 Sep;1(7):515–23.

43. King M, Render M, Ely E, Watson P. Liberation and Animation: Strategies to Minimize Brain Dysfunction in Critically Ill Patients. Semin Respir Crit Care Med. 2010 Feb;31(01):087–96.

44. Hipp DM, Ely EW. Pharmacological and Nonpharmacological Management of Delirium in Critically Ill Patients. Neurotherapeutics. 2012 Jan;9(1):158–75.

45. Inouye SK, Rushing JT, Foreman MD, Palmer RM, Pompei P. Does delirium contribute to poor hospital outcomes?: A three-site epidemiologic study. J Gen Intern Med. 1998 Mar;13(4):234–42.

46. Fortini A, Morettini A, Tavernese G, Facchini S, Tofani L, Pazzi M. Delirium in elderly patients hospitalized in internal medicine wards. Intern Emerg Med. 2014 Jun;9(4):435–41.

47. Nagase M, Okamoto Y, Tsuneto S, Tanimukai H, Matsuda Y, Okishiro N, et al. A Retrospective Chart Review of Terminal Patients with Cancer with Agitation and Their Risk Factors. Journal of Palliative Medicine. 2012 Nov;15(11):1185–90.

48. Kim H, Chung S, Joo YH, Lee JS. The major risk factors for delirium in a clinical setting. Neuropsychiatric Disease and Treatment. :7.

49. Kubota K, Suzuki A, Ohde S, Yamada U, Hosaka T, Okuno F, et al. Age is the Most Significantly Associated Risk Factor With the Development of Delirium in Patients Hospitalized for More Than Five Days in Surgical Wards: Retrospective Cohort Study. Annals of Surgery. 2018 May;267(5):874–7.

50. Han JH, Zimmerman EE, Cutler N, Schnelle J, Morandi A, Dittus RS, et al. Delirium in Older Emergency Department Patients: Recognition, Risk Factors, and Psychomotor Subtypes. Academic Emergency Medicine. 2009 Mar;16(3):193–200.

51. Elie M, Cole MG, Primeau FJ, Bellavance F. Delirium risk factors in elderly hospitalized patients. J Gen Intern Med. 1998 Mar;13(3):204–12.

52. Litaker D, Locala J, Franco K, Bronson DL, Tannous Z. Preoperative risk factors for postoperative delirium. General Hospital Psychiatry. 2001 Mar;23(2):84–9.

53. Laurila JV, Laakkonen M-L, Laurila JV, Timo SE, Reijo TS. Predisposing and precipitating factors for delirium in a frail geriatric population. Journal of Psychosomatic Research. 2008 Sep;65(3):249–54.

54. Lee J, Chung S, Joo Y, Kim H. The major risk factors for delirium in a clinical setting. NDT. 2016 Jul;Volume 12:1787–93.

55. Jayaswal A, Sampath H, Soohinda G, Dutta S. Delirium in medical intensive care units: Incidence, subtypes, risk factors, and outcome. Indian J Psychiatry. 2019;61(4):352.

56. George J, Rockwood K. Dehydration and Delirium--Not a Simple Relationship. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences. 2004 Aug 1;59(8):M811–2.

57. Magny E, Le Petitcorps H, Pociumban M, Bouksani-Kacher Z, Pautas É, Belmin J, et al. Predisposing and precipitating factors for delirium in community-dwelling older adults admitted to hospital with this condition: A prospective case series. Marengoni A, editor. PLoS ONE. 2018 Feb 23;13(2):e0193034.

58. Laurila JV, Laakkonen M-L, Laurila JV, Timo SE, Reijo TS. Predisposing and precipitating factors for delirium in a frail geriatric population. Journal of Psychosomatic Research. 2008 Sep;65(3):249–54.

59. Inouye SK. Precipitating Factors for Delirium in Hospitalized Elderly Persons: Predictive Model and Interrelationship With Baseline Vulnerability. JAMA. 1996 Mar 20;275(11):852.

60. Trzepacz PT, Kishi Y, Kean J. Delirium Phenotype by Age and Sex in a Pooled Data Set of Adult Patients. J Neuropsychiatry Clin Neurosci. 2018;8.

61. Ahmet Turan ishk. Delirium in elderly patients. 1st edition. New York, NY: Springer Berlin Heidelberg; 2017.

ANNEXURES

PROFORMA

Name			Past history including cognitive status & special sensory impairment	
Age				
Sex			Drug history	
Education				
Address				
Care giver				
In patient no.			Personal history	
Date of admission				
Clinical details including ADL			General examination	
			Systemic examination	

CAM Score	
DRS-R-98 Score	
MINI COG Score	

INVESTIGATIONS	DIAGNOSIS
PREDISPOSING FACTORS	PRECIPITATING FACTORS
SUBTYPE	

The Confusion Assessment Method Instrument

Acute onset

1. Is there evidence of an acute change in mental status from the patient's baseline?

Inattention*

2. A. Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?

- Not present at any time during interview.
- Present at some time during interview, but in mild form.
- Present at some time during interview, in marked form.
- Uncertain.

B. (If present or abnormal) Did this behavior fluctuate during the interview, that is, tend to come and go or increase and decrease in severity?

- Yes.
- No.
- Uncertain
- Not applicable.

C. (If present or abnormal) Please describe this behavior:

Disorganized thinking

3. Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

Altered level of consciousness

4. Overall, how would you rate this patient's level of consciousness?

- Alert (normal).
- Vigilant (hyperalert, overly sensitive to environmental stimuli, startled very easily).
- Lethargic (drowsy, easily aroused).
- Stupor (difficult to arouse).
- Coma (unarousable).
- Uncertain.

Disorientation

5. Was the patient disoriented at any time during the interview, such as thinking that he or she was somewhere other than the hospital, using the wrong bed, or misjudging the time of day?

Memory impairment

6. Did the patient demonstrate any memory problems during the interview, such as inability to remember events in the hospital or difficulty remembering instructions?

Perceptual disturbances

7. Did the patient have any evidence of perceptual disturbances, for example, hallucinations, illusions, or misinterpretations (such as thinking something was moving when it was not)?

Psychomotor agitation

8. Part 1.

At any time during the interview, did the patient have an unusually increased level of motor activity, such as restlessness, picking at bedclothes, tapping fingers, or making frequent sudden changes of position?

Psychomotor retardation

8. Part 2.

At any time during the interview, did the patient have an unusually decreased level of motor activity, such as sluggishness, staring into space, staying in one position for a long time, or moving very slowly?

Altered sleep-wake cycle

9. Did the patient have evidence of disturbance of the sleep-wake cycle, such as excessive daytime sleepiness with insomnia at night?

The Confusion Assessment Method (CAM) Diagnostic Algorithm*

Feature 1. Acute Onset and Fluctuating Course

This feature is usually obtained from a family member or nurse and is shown by positive responses to the following questions: Is there evidence of an acute change in mental status from the patient's baseline? Did the (abnormal) behavior fluctuate during the day, that is, tend to come and go, or increase and decrease in severity?

Feature 2. Inattention

This feature is shown by a positive response to the following question: Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?

Feature 3. Disorganized Thinking

This feature is shown by a positive response to the following question: Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

Feature 4. Altered Level of Consciousness

This feature is shown by any answer other than "alert" to the following question: Overall, how would you rate this patient's level of consciousness? (alert [normal], vigilant [hyperalert], lethargic [drowsy, easily aroused], stupor[difficult to arouse], or coma [unarousable])

*** The diagnosis of delirium by CAM requires the presence of features 1 and 2 and either 3 or 4.**

Adapted from Inouye, S. K. (1990). *Clarifying Confusion: The Confusion Assessment Method. Annals of Internal Medicine, 113(12), 941.* doi:10.7326/0003-4819-113-12-941

GENERAL INSTRUCTIONS FOR USE OF THE DRS-R-98

The Delirium Rating Scale-Revised-98 (DRS-R-98) is a 16-item clinician-rated scale with two sections and a score sheet. The 13-item severity section can be scored separately from the 3-item diagnostic section; their sum constitutes the total scale score. The severity section functions as a separate scale for repeated measures at short intervals within an episode of delirium. The total scale can be scored initially to enhance differential diagnosis by capturing characteristic features of delirium, such as acute onset and fluctuation of symptom severity. Concomitant use of diagnostic criteria such as from the International Classification of Disease (ICD)-10 Research Manual or versions of the Diagnostic and Statistical Manual (DSM) will enhance its ability to measure delirium when demented patients are involved because the DRS-R-98 is mostly a severity scale.

All items are anchored by text descriptions as guides for rating along a continuum from normal to severely impaired. Severity items are rated from 0 to 3 points and diagnostic items from 0 to either 2 or 3 points. The scoresheet offers space to circle item ratings and to optionally note characteristics of symptoms (e.g., type of hallucination) or the condition of patients during the ratings (e.g., restrained).

Though designed to be rated by psychiatrists, other physicians, nurses, and psychologists can use it if they have had appropriate clinical training in evaluating psychiatric phenomenology in medically ill patients. It can be used in research or comprehensive clinical evaluations. It does require enough clinical expertise to distinguish, for example, language problems from thought process abnormalities or delusions from confabulation. Even with sufficient clinical expertise, at times it may be difficult to make certain distinctions and more than one item may need to be rated to reflect that presentation (e.g., Wernicke’s aphasia and severe loose associations).

The DRS-R-98 can be used in conjunction with the Delirium Rating Scale (DRS) for certain research purposes because they differ substantially in descriptions of items. For example, the DRS may be more helpful for patients emerging from stupor.

The DRS-R-98 measures symptoms without regard to cause. Thus, preexisting conditions may add points, for example, dysphasia will affect the language item. However, longitudinal ratings will clarify effects of preexisiting conditions after the delirium has cleared. The inclusion of mentally retarded and Cognitive Disorder Not Otherwise Specified subjects during the validation study suggests that delirium can still be reliably assessed in the presence of such confounds.

All sources of available information are used to rate the patient—family, visitors, hospital staff, doctors, medical chart, and so on. Even a hospital roommate can contribute information. During interviews for such collateral information, ensure that terms used are mutually understood before accepting others’ interpretation of symptoms

Any time frame can be chosen for the DRS-R-98. Time frames greater than 24 hours are probably not necessary as this coincides with circadian rhythms and their possible disruptions. Shorter periods (e.g., 4 to 12 hours) may be helpful for intervention assessment—either for clinical or research purposes—though the fluctuating nature of symptom severity may need to be considered when interpreting the scores. Choosing periods less than 2 hours risks not adequately capturing some items (e.g., hallucinations, sleep-wake cycle disturbance) that occur intermittently. In such circumstances, a researcher may wish to use a smaller subset of items to monitor the patient, though such a subscale has not been validated.

Some items are rated based on examination and history, while others incorporate formal testing (e.g., cognitive and language items). It may be useful for a given clinician to standardize the questions used routinely in his/her practice, for example, asking months of the year backwards for attention, clockface or puzzle pieces for visuospatial ability, and par- ticular items for confrontational naming. Adjunctive use of the Cognitive Test for Delirium (CTD) or some of its items offers the advantage of not needing the patient to write or speak. Evaluation of general information included in the long- term memory item should be geared appropriately to the educational and cultural background of the patient.

When both interview behavior and formally elicited responses are used, the relative contribution of each needs to be weighed by the clinician and a scoring judgment needs to be made. For example, on the attention item a patient has difficulty with reciting months of the year backwards but attends fairly well during the interview, or on long-term memory a patient recalls personal remote information accurately, but cannot recall well on formal testing of three words after 15 minutes.

Despite text descriptions for each item rating, the rater may need to exercise judgment in scoring. At times an inter- mediate rating with a 0.5 point interval may be needed (e.g., 2.5 points) if the rater cannot decide between two choices. Also, the time frame chosen may affect how to weigh the presence of certain symptoms. For example, a patient who has periods of intense hyperactivity and hypoactivity in a 24-hour period would be rated as “3” on both items #7 and 8. If this same patient is rated for a shorter interval that only involved hyperactivity, then item #7 would be rated as “3” and item #8 would be “0”.

In cases where an item cannot be rated at all, the rater should make a notation on the score sheet and decide later how to handle that item’s scoring. If used for research, a statistical consultant may have to advise. If used clinically, altering the denominator of the maximum possible score may be acceptable.

DELIRIUM RATING SCALE (DRS-R-98)

This is a revision of the Delirium Rating Scale (Trzepacz et al. 1988). It is used for initial assessment and repeated measurements of delirium symptom severity. The sum of the 13 item scores provides a severity score. All available sources of information are used to rate the items (nurses, family, chart) in addition to examination of the patient. For serial repeated ratings of delirium severity, reasonable time frames should be chosen between ratings to document meaningful changes because delirium symptom severity can fluctuate without interventions.

DRS-R-98 SEVERITY SCORE

Sleep wake cycle disturbance

Rate sleep-wake pattern using all sources of information, including from family, caregivers, nurses' reports, and patient. Try to distinguish sleep from resting with eyes closed.

0. Not present

1. Mild sleep continuity disturbance at night or occasional drowsiness during the day

2. Moderate disorganization of sleep-wake cycle (e.g., falling asleep during conversations, napping during the day or several brief awakenings during the night with confusion/behavioral changes or very little nighttime sleep)

3. Severe disruption of sleep-wake cycle (e.g., day-night reversal of sleep-wake cycle or severe circadian fragmentation with multiple periods of sleep and wakefulness or severe sleeplessness.)

Perceptual disturbance and hallucinations

Illusions and hallucinations can be of any sensory modality. Misperceptions are "simple" if they are uncomplicated, such as a sound,noise, color, spot, or flashes and ''complex'' if they are multidimensional, such as voices, music, people, animals, or scenes. Rate if reported by patient or caregiver, or inferred by observation.

0. Not present

1. Mild perceptual disturbances (e.g., feelings of derealization or depersonalization; or patient may not be able to discriminate dreams from reality)

2. Illusions present

3. Hallucinations present

Delusions

Delusions can be of any type, but are most often persecutory. Rate if reported by patient, family or caregiver. Rate as delusional if ideas are unlikely to be true yet are believed by the patient who cannot be dissuaded by logic. Delusional ideas cannot be explained otherwise by the patient's usual cultural or religious background.

0. Not present

1. Mildly suspicious, hypervigilant, or preoccupied

2. Unusual or overvalued ideation that does not reach delusional proportions or could be plausible

3. Delusional

Lability of affect

Rate the patient's affect as the outward presentation of emotions and not as a description of what the patient feels.

0. Not present

1. Affect somewhat altered or incongruent to situation; changes over the course of hours; emotions are mostly under self-control

2. Affect is often inappropriate to the situation and intermittently changes over the course of minutes; emotions are not consistently

under self-control, though they respond to redirection by others

3. Severe and consistent disinhibition of emotions; affect changes rapidly, is inappropriate to context, and does not respond to redirection by others

Language

Rate abnormalities of spoken, written or sign language that cannot be otherwise attributed to dialect or stuttering. Assess fluency, grammar, comprehension, semantic content and naming. Test comprehension and naming nonverbally if necessary by having patient follow commands or point.

0. Normal language

1. Mild impairment including word-finding difficulty or problems with naming or fluency

2. Moderate impairment including comprehension difficulties or deficits in meaningful communication (semantic content)

3. Severe impairment including nonsensical semantic content, word salad, muteness, or severely reduced comprehension

Thought process abnormalities

Rate abnormalities of thinking processes based on verbal or written output. If a patient does not speak or write, do not rate this item.

0. Normal thought processes

1. Tangential or circumstantial

2. Associations loosely connected occasionally, but largely comprehensible

3. Associations loosely connected most of the time

Motor agitation

Rate by observation including from other sources of observation such as by visitors, family and clinical staff. Do not include dyskinesia, tics, or chorea.

0. No restlessness or agitation

1. Mild restlessness of gross motor movements or mild fidgetiness

2. Moderate motor agitation including dramatic movements of the extremities, pacing, fidgeting, removing intravenous lines, etc.

3. Severe motor agitation, such as combativeness or a need for restraints or seclusion

Motor retardation

Rate movements by direct observation or from other sources of observation such as family, visitors, or clinical staff. Do not rate components of retardation that are caused by parkinsonian symptoms. Do not rate drowsiness or sleep.

0. No slowness of voluntary movements

1. Mildly reduced frequency, spontaneity or speed of motor movements, to the degree that may interfere somewhat with the assessment.

2. Moderately reduced frequency, spontaneity or speed of motor movements to the degree that it interferes with participation in activities or self-care

3. Severe motor retardation with few spontaneous movements.

Orientation

Patients who cannot speak can be given a visual or auditory presentation of multiple choice answers. Allow patient to be wrong by upto 7 days instead of 2 days for patients hospitalized more than 3 weeks. Disorientation to person means not recognizing familiar persons and may be intact even if the person has naming difficulty but recognizes the person. Disorientation to person is most severe when one doesn't know one's own identity and is rare. Disorientation to person usually occurs after disorientation to time and/or place.

0. Oriented to person, place and time

1. Disoriented to time (e.g., by more than 2 days or wrong month or wrong year) or to place (e.g., name of building, city, state), but not both

2. Disoriented to time and place

3. Disoriented to person

Attention

Patients with sensory deficits or who are intubated or whose hand movements are constrained should be tested using an alternate modality besides writing. Attention can be assessed during the interview (e.g., verbal perseverations, distractibility, and difficulty with set shifting) and/or through use of specific tests, e.g., digit span.

0. Alert and attentive

1. Mildly distractible or mild difficulty sustaining attention, but able to refocus with cueing. On formal testing makes only minor errors and is not significantly slow in responses

2. Moderate inattention with difficulty focusing and sustaining attention. On formal testing, makes numerous errors and either requires prodding to focus or finish the task

3. Severe difficulty focusing and/or sustaining attention, with many incorrect or incomplete responses or inability to follow instructions. Distractible by other noises or events in the environment

Short-term memory

Defined as recall of information (e.g., 3 items presented either verbally or visually) after a delay of about 2 to 3 minutes. When formally tested, information must be registered adequately before recall is tested. The number of trials to register as well as effect of cueing can be noted on scoresheet. Patient should not be allowed to rehearse during the delay period and should be distracted during that time. Patient may speak or nonverbally communicate to the examiner the

identity of the correct items. Short-term deficits noticed during the course of the interview can be used also.

0. Short-term memory intact

1. Recalls 2/3 items; may be able to recall third item after category cueing

2. Recalls 1/3 items; may be able to recall other items after category cueing

3. Recalls 0/3 item

Long-term memory

Can be assessed formally or through interviewing for recall of past personal (e.g., past medical history or information or experiences that can be corroborated from another source) or general information that is culturally relevant. When formally tested, use a verbal and/or visual modality for 3 items that are adequately registered and recalled after at least 5 minutes. The patient should not be allowed to rehearse during the delay period during formal testing. Make allowances for patients with less than 8 years of education or who are mentally retarded regarding general information questions. Rating of the severity of deficits may involve a judgment about all the ways long-term memory is assessed, including recent and/or remote long-term memory ability informally tested during the interview as well as any formal testing of recent long-term memory using 3 items.

0. No significant long-term memory deficits

1. Recalls 2/3 items and/or has minor difficulty recalling details of other long-term information

2. Recalls 1/3 items and/or has moderate difficulty recalling other long-term information

3. Recalls 0/3 items and/or has severe difficulty recalling other long-term information

Visuospatial ability

Assess informally and formally. Consider patient's difficulty navigating one's way around living areas or environment (e.g., getting lost).Test formally by drawing or copying a design, by arranging puzzle pieces, or by drawing a map and identifying major cities, etc. Take into account any visual impairments that may affect performance.

0. No impairment

1. Mild impairment such that overall design and most details or pieces are correct; and/or little difficulty navigating in his/her surroundings

2. Moderate impairment with distorted appreciation of overall design and/or several errors of details or pieces; and/or needing repeated redirection to keep from getting lost in a newer environment despite, trouble locating familiar objects in immediate environment

3. Severe impairment on formal testing; and/or repeated wandering or getting lost in environment

DRS-R-98 OPTIONAL DIAGNOSTIC ITEMS

These three items can be used to assist in the differentiation of delirium from other disorders for diagnostic and research purposes. They are added to the severity score for the total scale score, but are NOT included in the severity score.

Temporal onset of symptoms

Rate the acuteness of onset of the initial symptoms of the disorder or episode being currently assessed, not their total duration. Distinguish the onset of symptoms attributable to delirium when it occurs concurrently with a different preexisting psychiatric disorder. For example, if a patient with major depression is rated during a delirium episode due to an overdose, then rate the onset of the delirium symptoms.

0. No significant change from usual or longstanding baseline behavior

1. Gradual onset of symptoms, occurring over a period of several weeks to a month

2. Acute change in behavior or personality occurring over days to a week

3. Abrupt change in behavior occurring over a period of several hours to a day

Fluctuation of symptom severity

Rate the waxing and waning of an individual or cluster of symptom(s) over the time frame being rated. Usually applies to cognition, affect, intensity of hallucinations, thought disorder, language disturbance. Take into consideration that perceptual disturbances usually occur intermittently, but might cluster in period of greater intensity when other symptoms fluctuate in severity.

0. No symptom fluctuation

1. Symptom intensity fluctuates in severity over hours

2. Symptom intensity fluctuates in severity over minutes

Physical disorder

Rate the degree to which a physiological, medical or pharmacological problem can be specifically attributed to have caused the symptoms being assessed. Many patients have such problems but they may or may not have causal relationship to the symptoms being rated.

0. None present or active

1. Presence of any physical disorder that might affect mental state

2. Drug, infection, metabolic disorder, CNS lesion or other medical problem that specifically can be implicated in causing the altered behavior or mental state

DELIRIUM RATING SCALE (DRS-R-98)

Severity items	**Item score**				**Optional information**
Sleep wake cycle	0	1	2	3	
Perceptual disturbance	0	1	2	3	
delusions	0	1	2	3	
Lability of affect	0	1	2	3	
Language	0	1	2	3	
Thought process	0	1	2	3	
Motor agitation	0	1	2	3	
Motor retardation	0	1	2	3	
Orientation	0	1	2	3	
Attention	0	1	2	3	
Short term memory	0	1	2	3	
Long term memory	0	1	2	3	
Visuospatial ability	0	1	2	3	
Diagnostic items	**Item score**				**Optional information**
Tempotal onset of symptoms	0	1	2	3	
Fluctuation of symptom severity	0	1	2		
Physical disorder	0	1	2		
Severity score:					**Total score:**

Adapted from Trzepacz PT, Mittal D, Torres R, Kanary K, Norton J, Jimerson N. Validation of the Delirium Rating Scale-Revised-98: Comparison With the Delirium Rating Scale and the Cognitive Test for Delirium. J Neuropsychiatry Clin Neurosci. 2001;14.

Richmond Agitation Sedation Scale (RASS) *

Score	Term	Description
+4	Combative	Overtly combative, violent, immediate danger to staff
+3	Very agitated	Pulls or removes tube(s) or catheter(s); aggressive
+2	Agitated	Frequent non-purposeful movement, fight ventilator
+1	Restless	Anxious but movements not aggressive vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained awakening(eye-opening/eye contact) to voice (>10 seconds)
-2	Light sedation	Briefly awakens with eye contact to voice(<10 seconds)
-3	Moderate sedation	Movement or eye opening to voice (but no eye contact)
-4	Deep sedation	No response to voice, but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

* Sessler CN, Gosnell M, Grap MJ, Brophy GT, O'Neal PV, Keane KA et al. The Richmond AgitationSedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002; 166:1338-1344.

* Ely EW, Truman B, Shintani A, Thomason JWW, Wheeler AP, Gordon S et al. Monitoring sedation status over time in ICU patients: the reliability and validity of the Richmond Agitation Sedation Scale (RASS). JAMA 2003; 289:2983-2991.Verbal Stimulation Physical Stimulation

Procedure for RASS Assessment

1. Observe patient

a. Patient is alert, restless, or agitated. (score 0 to +4)

2. If not alert, state patient's name and say to open eyes and look at speaker.

b. Patient awakens with sustained eye opening and eye contact. (score –1)

c. Patient awakens with eye opening and eye contact, but not sustained. (score –2)

d. Patient has any movement in response to voice but no eye contact. (score –3)

3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.

e. Patient has any movement to physical stimulation. (score –4)

f. Patient has no response to any stimulation. (score –5)

* Sessler CN, Gosnell M, Grap MJ, Brophy GT, O'Neal PV, Keane KA et al. The Richmond AgitationSedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002; 166:1338-1344.

* Ely EW, Truman B, Shintani A, Thomason JWW, Wheeler AP, Gordon S et al. Monitoring sedation status over time in ICU patients: the reliability and validity of the Richmond Agitation Sedation Scale (RASS). JAMA 2003; 289:2983-2991.Verbal Stimulation Physical Stimulation

MINI COG

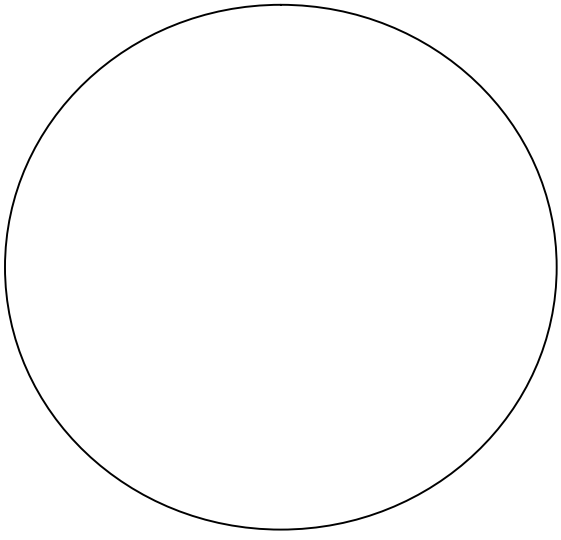
Step 1: Three word registration

Look directly at person and say, “Please listen carefully. I am going to say three words that I want you to repeat back to me now and try to remember. The words are [select a list of words from the versions below]. Please say them for me now.” If the person is unable to repeat the words after three attempts, move on to Step 2 (clock drawing). The following and other word lists have been used in one or more clinical studies.1-3 For repeated administrations, use of an alternative word list is recommended.

Version 1	**Version 2**	**Version 3**	**Version 4**	**Version 5**	**Version 6**
Banana	Leader	Village	River	Captain	Daughter
Sunrise	Season	Kitchen	Nation	Garden	Heaven
Chair	Table	Baby	Finger	Picture	Mountain

Step 2: Clock Drawing

Say: “Next, I want you to draw a clock for me. First, put in all of the numbers where they go.” When that is completed, say: “Now, set the hands to 10 past 11.” Use preprinted circle (see next page) for this exercise. Repeat instructions as needed as this is not a memory test. Move to Step 3 if the clock is not complete within three minutes.



Step 3: Three Word Recall

Ask the person to recall the three words you stated in Step 1. Say: "What were the three words I asked you to remember?" Record the word list version number and the person's answers below.
Word List Version: _____ Person's Answers: _____, _____, _____.

Scoring

Word Recall: ____ (0-3 points)	1 point for each word spontaneously recalled without cueing.
Clock Draw: ____ (0 or 2 points)	Normal clock = 2 points. A normal clock has all numbers placed in the correct sequence and approximately correct position (e.g., 12, 3, 6 and 9 are in anchor positions) with no missing or duplicate numbers. Hands are pointing to the 11 and 2 (11:10). Hand length is not scored. Inability or refusal to draw a clock (abnormal) = 0 points.
Total Score: ____ (0-5 points)	Total score = Word Recall score + Clock Draw score. A cut point of < 3 has been validated for dementia screening, but many individuals with clinically meaningful cognitive impairment will score higher. When greater sensitivity is desired, a cut point of < 4 is recommended as it may indicate a need for further evaluation of cognitive status.

Adapted from Borson S. The mini-cog: a cognitive "vitals signs" measure for dementia screening in multi-lingual elderly Int J Geriatr Psychiatry 2000; 15(11):1021.

INFORMATION SHEET

We are conducting a study titled **"Evaluation of Delirium in Hospitalized Elderly Patients"**at Madras Medical College &Rajiv Gandhi Government General Hospital, Chennai and for that your participation may be valuable to us.

The purpose of this study is to find the Etiology (Predisposing and Precipitating factors) Delirium sub types in Hospitalised Elderly Patients which helps in management.

The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.

The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of investigator Signature of participant/ Attender

Date:

Place: Chennai.

PATIENT CONSENT FORM

Study Detail : **"Evaluation of Delirium in Hospitalized Elderly Patients"**

Study Centre : Rajiv Gandhi Govt. General Hospital, Chennai.

Patient's Name :

Patient's Age :

Identification No.:

Patient may check (✓) these boxes:

a) I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ☐

b) I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ☐

c) I understand that sponsor of the clinical study, others working on the sponsor's behalf, the ethical committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study. ☐

d) I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or wellbeing or any unexpected or unusual symptoms. ☐

e) I hereby consent to participate in this study. ☐

f) I hereby give permission to undergo complete clinical examination and hematological tests. ☐

Signature / Thumb Impression of Patient/ Attender

Signature of Investigator

Patient's Name & Address:

Study Investigator's Name:

ஆராய்ச்சி தகவல் தாள்

ஆராய்ச்சி தலைப்பு
மருத்துவமனையில் அனுமதிக்கப்பட்ட முதியோரின் சித்தபிரமையை (Delirium) மதிப்பிடுதல்.

பெயர்	:	தேதி	:
வயது	:	உள் நோயாளி எண்	:
பால்	:	ஆராய்ச்சி சேர்க்கை எண்	:

இந்த ஆராய்ச்சின் விவரங்களும் அதன் நோக்கங்களும் முழுமையாக நோயாளியின உறவினரான எனக்கு தெளிவாக விளக்கப்பட்டது.

எனக்கு விளக்கப்பட்ட விஷயங்களை நான் புரிந்துகொண்டு எனது சம்மதத்தை தெரிவிக்கிறேன்.

இந்த ஆராய்ச்சியில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின்பேரில் நோயாளி பங்கு பெற சம்மதிக்கிறேன். இந்த ஆராய்ச்சியில் இருந்து எந்நேரமும் பின்வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்துகொண்டேன்.

நோயாளியின் உறவினரான நான் இந்த மருத்துவ ஆராய்ச்சியில் நோயாளியை சேர்த்துக்கொள்ள சம்மதம் தெரிவிக்கிறேன்.

ஆய்வாளரின் கையொப்பம்

பங்கேற்பாளர் கையொப்பம்/
பங்கேற்பாளர் உறவினர் கையொப்பம்

தேதி

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராயச்சியின் தலைப்பு

மருத்துவமனையில் அனுமதிக்கப்பட்ட முதியோரின் சித்தபிரமையை (Delirium) மதிப்பிடுதல்.

ஆய்வு நிலையம் : முதியோர் மருத்துவத்துறை,
சென்னை மருத்துவக் கல்லூரி சென்னை - 3.

பங்கு பெறுவரின் பெயர் :

பங்குபெறுபவரின் எண் :

பங்குபெறுபவர்/ பங்குபெறுபவரின் உறவினர் இதனை (✓) குறிக்கவும்

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் நோயாளியின் உறவினரான எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது. ☐

எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நோயாளி இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன். ☐

இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் நோயாளியின் மருத்துவ அறிக்கைகளை பார்ப்பதற்கு நோயாளியின் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நோயாளி ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன். ☐

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும் நோயாளியின் உறவினரான நான் முழு மனதுடன் சம்மதிக்கின்றேன். ☐

இந்த ஆய்வில் நோயாளி பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன் 'இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிகிறேன். ☐

பங்கேற்பாளர் கையொப்பம்/

பங்கேற்பாளர் உறவினர் கையொப்பம்/ ..... இடம்..... தேதி.....

கட்டைவிரல் ரேகை

பங்கேற்பவரின் பெயர் மற்றும் விலாசம்

.....

ஆய்வாளரின் கையொப்பம் ..... இடம்..... தேதி.....

ஆய்வாளரின் பெயர் .....

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003

EC Reg.No.ECR/270/Inst./TN/2013
Telephone No.044 25305301
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.Mohanavel.S.
I Year PG in M.D. Geriatrics
Department of Geriatric Medicine
Madras Medical College
Chennai

Dear Dr.Mohanavel.S.

The Institutional Ethics Committee has considered your request and approved your study titled **"EVALUATION OF DELIRIUM IN HOSPITALIZED ELDERLY PATIENTS " - NO.27042018**

The following members of Ethics Committee were present in the meeting held on **03.04.2018** conducted at Madras Medical College, Chennai 3

1. Prof.P.V.Jayashankar :Chairperson
2. Prof.R.Jayanthi,MD.,FRCP(Glasg) Dean,MMC,Ch-3 : Deputy Chairperson
3. Prof.Sudha Seshayyan,MD., Vice Principal,MMC,Ch-3 : Member Secretary
4. Prof.N.Gopalakrishnan,MD,Director,Inst.of Nephrology,MMC,Ch : Member
5. Prof.S.Mayilvahanan,MD,Director,Inst. of Int.Med,MMC, Ch-3 : Member
6. Prof.A.Pandiya Raj,Director, Inst. of Gen.Surgery,MMC : Member
7. Prof.Shanthy Gunasingh, Director, Inst.of Social Obstetrics,KGH : Member
8. Prof.Rema Chandramohan,Prof.of Paediatrics,ICH,Chennai : Member
9. Prof. Susila, Director, Inst. of Pharmacology,MMC,Ch-3 : Member
10. Prof.K.Ramadevi,MD., Director, Inst. of Bio-Chemistry,MMC,Ch-3 : Member
11. Prof.Bharathi Vidya Jayanthi,Director, Inst. of Pathology,MMC,Ch-3: Member
12. Thiru S.Govindasamy, BA.,BL,High Court,Chennai : Lawyer
13. Tmt.Arnold Saulina, MA.,MSW., :Social Scientist
14. Thiru K.Ranjith, Ch- 91 : Lay Person

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary – Ethics Committee

Urkund Analysis Result

Analysed Document: evaluation of delirium.docx (D57280176)
Submitted: 10/19/2019 1:45:00 PM
Submitted By: madhu.svz1992@gmail.com
Significance: 8 %

Sources included in the report:

Thesis Modified ur.docx (D43261407)
SSC Project.docx (D20665822)
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2717440/
https://slideplayer.com/slide/12483964/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5256313/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6657559/
https://www.sciencedirect.com/science/article/pii/S2213158219301597
https://dokumen.tips/documents/nursing-management-of-delirium-siriraj-clubgrand-roundphysical-disorder-8.html
https://slideplayer.com/slide/6255006/
https://accessmedicine.mhmedical.com/content.aspx?bookid=371&Sectionid=41587665
https://oncohemakey.com/delirium-4/
https://medicinainternaelsalvador.com/wp-content/uploads/2018/07/Psychosis.12.pdf
https://accessmedicine.mhmedical.com/content.aspx?legacysectionid=haz7e_ch47
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6722464/
https://www.researchgate.net/publication/23175404_Predisposing_and_precipitating_factors_for_delirium_in_a_frail_geriatric_population
a5d66029-ccf1-4efa-ab4a-1e788e12eb86
https://www.cfps.org.sg/publications/the-singapore-family-physician/article/1051_pdf
https://www.bjmp.org/content/assessment-risk-factors-and-precipitating-factors-delirium-patients-admitted-intensive-care-unit-tertiary-care-hospital
https://www.researchgate.net/publication/11537075_Early_recognition_of_delirium_Review_of_the_literature

Instances where selected sources appear:

38

CERTIFICATE - II

This is to certify that this dissertation work titled EVALUATION OF DELIRIUM IN HOSPITALIZED ELDERLY PATIENTS of the candidate Dr. S.MOHANAVEL with registration Number 201726003 for the award of M.D., degree in the branch of GERIATRIC MEDICINE. I personally verified the urkund.com website for the purpose of plagiarism Check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows 8 percentage of plagiarism in the dissertation.

Guide & Supervisor sign with Seal.

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
1	70	F	4th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
2	63	M	8th std	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes
3	60	F	8th std	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
4	62	F	10th std	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	No	No
5	82	M	5th std	No	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes	No	No
6	65	M	6th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
7	76	F	Illiterate	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	No	Yes	No	No
8	75	M	3rd std	No	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No	No	Yes
9	70	M	5th std	No	No	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No	Yes	No
10	85	F	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
11	74	M	11th std	No	Yes	No	No	No	Yes	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
12	78	F	Illiterate	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	No	No
13	60	M	10th std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
14	70	M	5th std	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	Yes	No
15	62	M	10th std	No	No	No	No	No	Yes	No	No	Yes	No	No	No	Yes	No	Yes	No	No	Yes	No	No
16	68	M	8th std	No	Yes	No	No	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	Yes	No	No
17	65	M	5th std	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
18	70	M	6th std	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	No	No
19	73	M	8th std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
20	65	M	10th std	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes
21	84	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes
22	65	M	5th std	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
23	60	M	8th std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
24	72	M	B.A	No	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	No	Yes	No	Yes	No
25	74	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes	No	No
26	83	F	Illiterate	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
27	76	M	10th std	No	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes
28	70	M	5th std	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	No	No	No	Yes
29	65	M	3rd std	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
30	65	M	7th std	No	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	Yes	No	No
31	80	F	Illiterate	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	No	No
32	65	F	3rd std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No	Yes	No	No
33	60	F	Illiterate	No	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	Yes	No	No
34	60	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
35	65	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
36	65	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
37	65	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No	No
38	85	F	Illiterate	Yes	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	Yes	No	No
39	70	F	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	No	No
40	80	M	Illiterate	No	No	Yes	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
41	65	F	3rd std	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
42	65	F	5th std	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	No
43	79	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes
44	60	F	3rd std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	Yes	No	No
45	62	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
46	70	F	Illiterate	No	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes	No	No
47	94	M	3rd std	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No	No	Yes
48	79	M	8th std	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	No	No	Yes
49	63	M	Illiterate	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No
50	80	M	4th std	No	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
51	84	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	Yes	No	No
52	85	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	No
53	78	M	4th std	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
54	60	M	8th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
55	72	M	5th std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
56	77	M	5th std	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
57	70	M	Illiterate	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No	No	Yes	No	No
58	65	M	7th std	No	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	No	No	No	No	No	Yes	No
59	80	M	3rd std	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
60	65	F	Illiterate	No	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	Yes	No	No
61	65	F	6th std	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
62	65	F	2nd std	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	No	No	No	No	Yes
63	70	F	Illiterate	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes	No	No
64	60	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No
65	60	M	10th std	No	No	Yes	No	No	Yes	No	Yes	No	No	Yes	No	Yes	No	No	No	No	No	Yes	No
66	68	F	3rd std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
67	75	F	Illiterate	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No	No	No	Yes	No
68	75	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
69	74	F	Illiterate	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No
70	78	F	Illiterate	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No
71	65	F	3rd std	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
72	76	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No
73	66	M	5th std	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	Yes	No
74	62	M	8th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No	Yes	No	No
75	78	M	8th std	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes	No	No
76	78	M	5th std	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	Yes	No	No	Yes	No	No
77	62	M	8th std	No	No	No	No	No	Yes	No	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No
78	65	M	4th std	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
79	79	M	5th std	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
80	66	M	Illiterate	No	No	No	No	No	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
81	80	M	Illiterate	No	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	No	No	Yes
82	85	M	3rd std	No	No	Yes	No	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	No	No	Yes	No	No
83	71	M	5th std	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
84	76	M	Illiterate	No	No	No	No	No	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No
85	71	M	3rd std	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
86	65	M	8th std	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes	No	No	Yes	No	No
87	75	M	3rd std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
88	72	M	Illiterate	No	No	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	Yes
89	60	F	10th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
90	70	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
91	97	F	Illiterate	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
92	75	M	Illiterate	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
93	67	M	5th std	No	Yes	No	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
94	95	M	Illiterate	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes
95	65	M	8th std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
96	86	M	8th std	No	Yes	Yes	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	Yes	No	No
97	63	M	10th std	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes
98	78	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No
99	79	M	Illiterate	No	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	No	No	Yes	No
100	60	M	Illiterate	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes
101	78	M	5th std	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	No	Yes	Yes	No	No	Yes	No	No
102	72	F	5th std	Yes	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No
103	70	F	8th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
104	65	M	8th std	No	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No
105	65	M	5th std	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
106	66	M	7th std	No	No	Yes	No	No	Yes	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes
107	73	M	Illiterate	No	Yes	No	No	No	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No
108	65	M	3rd std	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	Yes	No	No
109	78	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	Yes	No	Yes	No	Yes	No	No	Yes	No	No
110	63	M	8th std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes
111	62	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	Yes	No	Yes	No
112	68	F	Illiterate	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
113	65	F	Illiterate	No	Yes	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	No
114	65	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
115	65	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Yes
116	60	F	5th std	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
117	65	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	Yes	No	No
118	65	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
119	60	M	7th std	No	Yes	No	No	No	Yes	No	Yes	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes
120	80	M	Illiterate	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
121	70	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
122	70	M	Illiterate	Yes	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	Yes	No	No
123	60	M	Illiterate	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	Yes	No	No
124	69	M	3rd std	No	No	No	No	No	Yes	No	Yes	No	No	Yes	No	Yes	No	Yes	No	No	Yes	No	No
125	60	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes
126	70	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No	No	Yes
127	65	M	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
128	62	M	Illiterate	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
129	63	M	Illiterate	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No	No	Yes
130	75	M	10th std	Yes	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
131	75	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	Yes	No	No
132	62	M	5th std	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	Yes
133	72	M	Illiterate	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	No	No
134	64	M	3rd std	No	Yes	No	No	No	Yes	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes
135	80	F	Illiterate	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No
136	63	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
137	66	F	5th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	No
138	65	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
139	65	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
140	60	F	2nd std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	Yes
141	60	F	3rd std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
142	75	F	Illiterate	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
143	60	F	4th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes	No
144	70	F	Illiterate	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
145	75	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
146	70	M	5th std	No	Yes	No	No	No	Yes	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
147	66	M	8th std	No	Yes	No	No	No	No	No	Yes	No	No	Yes	No	Yes	No	Yes	No	No	Yes	No	No
148	65	F	5th std	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
149	65	M	5th std	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No
150	63	M	10th std	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No	No	Yes
151	63	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	Yes	No	No
152	75	F	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	Yes	Yes	No	No
153	60	F	5th std	No	No	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes
154	80	F	Illiterate	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No
155	60	F	7th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
156	72	F	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes	No	No
157	85	F	Illiterate	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	Yes	No
158	69	F	5th std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes	No	No
159	70	F	5th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	No	No	Yes	No	No
160	65	F	8th std	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	No	No	No	No	Yes

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
161	80	F	Illiterate	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	No	Yes	No	No
162	70	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes
163	98	F	Illiterate	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	No	Yes	No	No
164	65	F	5th std	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
165	66	F	2nd std	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	No	No	Yes	No	No
166	75	F	3rd std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
167	70	F	Illiterate	No	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No
168	70	F	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No
169	71	F	2nd std	No	No	No	No	No	No	No	Yes	No	Yes	No	No	Yes	No	Yes	No	No	Yes	No	No
170	80	F	Illiterate	No	Yes	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
171	71	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	Yes	No
172	65	F	2nd std	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	Yes	No	No	Yes	No	No
173	84	F	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes
174	75	F	Illiterate	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No
175	84	F	Illiterate	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No
176	60	F	5th std	No	No	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes
177	70	F	Illiterate	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes
178	65	F	Illiterate	No	Yes	No	No	No	No	Yes	Yes	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No
179	76	F	3rd std	No	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No
180	82	F	Illiterate	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No
181	60	F	5th std	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	Yes	No	No
182	73	F	2nd std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
183	60	M	8th std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes
184	74	M	Illiterate	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes	No	No
185	72	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
186	68	M	5th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes
187	76	M	5th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	Yes	No
188	70	M	3rd std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
189	61	M	Illiterate	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	Yes	No	Yes	No	No	Yes	No
190	75	M	3rd std	No	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes
191	72	M	8th std	No	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	Yes
192	85	M	Illiterate	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
193	74	M	5th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
194	101	M	Illiterate	No	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	Yes	No	No
195	68	M	8th std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
196	68	M	4th std	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes
197	65	M	Illiterate	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	No	No
198	68	M	5th std	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes
199	76	M	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
200	68	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
201	65	F	5th std	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No
202	75	F	Illiterate	No	Yes	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
203	60	F	3rd std	Yes	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No	No	Yes
204	70	F	Illiterate	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No
205	62	F	5th std	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	No	Yes
206	65	F	2nd std	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	Yes	No	No	Yes	No	No
207	80	F	Illiterate	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No
208	75	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No
209	65	F	3rd std	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	No	No
210	61	F	5th std	Yes	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
211	75	F	Illiterate	Yes	Yes	Yes	No	No	No	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes	No	No
212	60	F	8th std	Yes	Yes	No	No	No	No	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No	No	No	Yes
213	65	F	5th std	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
214	80	F	Illiterate	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No
215	66	F	Illiterate	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes
216	85	F	Illiterate	Yes	Yes	Yes	No	No	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
217	64	F	5th std	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No
218	86	F	Illiterate	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	No	Yes
219	80	F	Illiterate	Yes	Yes	Yes	No	No	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes
220	65	F	3rd std	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
221	60	F	5th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes
222	63	F	8th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No
223	83	F	Illiterate	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	Yes	No	No	Yes
224	73	F	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
225	70	F	5th std	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No
226	72	F	3rd std	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No
227	75	F	Illiterate	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
228	70	F	2nd std	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	No	Yes	No	No
229	68	F	5th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
230	65	M	Illiterate	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
231	80	M	Illiterate	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
232	70	M	4th std	No	Yes	No	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes	No
233	70	M	5th std	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No
234	79	M	Illiterate	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No
235	65	M	5th std	No	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes
236	76	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
237	70	M	Illiterate	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	No	Yes
238	70	M	Illiterate	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No
239	60	M	5th std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes
240	84	M	Illiterate	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	No	Yes	No

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
241	72	M	1st std	Yes	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes
242	85	M	Illiterate	No	No	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes	No	No
243	70	M	Illiterate	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
244	70	M	5th std	No	Yes	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	Yes	No
245	70	M	2nd std	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes
246	70	M	3rd std	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes	No
247	77	M	Illiterate	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
248	82	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No	Yes	No	No
249	70	M	Illiterate	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
250	75	M	5th std	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	Yes	No
251	62	M	8th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes
252	70	M	Illiterate	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No
253	85	M	Illiterate	No	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes	No	No
254	80	M	Illiterate	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
255	75	M	Illiterate	Yes	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes	No	No
256	65	M	5th std	Yes	No	Yes	No	No	Yes	No	Yes	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No
257	65	M	Illiterate	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	Yes	No	No	No	Yes	No	No	Yes
258	93	M	Illiterate	No	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes	No	No
259	65	M	5th std	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	No	No
260	72	M	3rd std	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes
261	65	M	10th std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
262	74	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	Yes
263	74	M	Illiterate	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes
264	67	M	7th std	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
265	61	M	10th std	No	No	No	No	No	No	No	Yes	No	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
266	75	M	8th std	Yes	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	Yes	No	No
267	86	M	Illiterate	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No
268	60	M	2nd std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
269	70	M	Illiterate	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No
270	70	M	5th std	No	No	Yes	No	No	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	Yes	No	No	Yes	No
271	87	M	Illiterate	No	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No	No	Yes
272	85	M	Illiterate	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No
273	65	M	6th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes	No
274	62	M	Illiterate	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	No
275	78	M	4th std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes
276	60	M	8th std	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes
277	72	M	6th std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
278	65	M	10th std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	Yes	No
279	63	M	Illiterate	No	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No
280	72	M	Illiterate	No	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No

S.No	Age	Sex	Education	Predisposing factors								Precipitating factors									Sub-type		
				Cognitive impairment including dementia	Functional impairment & disability	Vision/ hearing impairment	Psychiatric illness	Past history of delirium	History of alcohol abuse	Malnutrition	Medical comorbidities	Infection	Drugs including psychoactive, sedatives & polypharmacy	Hypoxia & pulmonary compromise	Major surgery	Vascular	Dehydration	Metabolic/ Endocrine	Toxic	Others inc. physical restraints & indwelling catheter	Hypoactive	Hyperactive	Mixed
281	85	M	5th std	No	Yes	Yes	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No	No
282	94	M	10th std	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	No
283	81	M	6th std	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	No	No
284	65	M	3rd std	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	Yes	Yes	No	No
285	68	M	3rd std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes	No
286	62	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No
287	82	M	6th std	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No
288	70	M	8th std	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
289	75	M	5th std	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes
290	93	M	10th std	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	No	No	Yes	No	No
291	69	M	Illiterate	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No
292	70	M	3rd std	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No
293	60	M	5th std	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Yes
294	68	M	2nd std	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
295	70	M	Illiterate	No	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No	No
296	82	M	Illiterate	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	No	No	No	No	No	Yes
297	60	M	5th std	No	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No
298	68	M	8th std	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	Yes	No
299	73	M	Illiterate	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes
300	65	M	6th std	No	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	Yes	No	No

	DRS-R-98		Medical Comorbidities										
SNo	Severity score	Total score	DM	HTN	CAD	CVA	CKD	CCF	COPD	CLD	Malignancy	Others	
1	17	21	Yes	Yes	No	No	No	No	No	No	No	No	
2	17	20	Yes	No	No	No	No	No	No	Yes	No	No	
3	18	20	Yes	Yes	Yes	No	No	No	No	No	No	Yes	
4	23	25	Yes	No	No	No	No	No	No	No	Yes	No	
5	17	20	No	No	No	No	No	No	No	No	No	Yes	
6	21	24	No	Yes	No	No	No	No	No	No	No	No	
7	20.5	23.5	No	Yes	No	Yes	Yes	No	No	No	No	Yes	
8	16.5	19.5	No	No	No	No	No	No	Yes	No	No	No	
9	20	23	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No	
10	18	20	Yes	Yes	Yes	Yes	No	No	No	No	No	No	
11	17.5	21.5	No	Yes	No	No	Yes	No	No	No	No	No	
12	21	24	No	No	No	No	No	No	No	No	No	No	
13	21.5	24	No	Yes	No	No	No	No	No	No	No	No	
14	18.5	21.5	Yes	Yes	No	Yes	No	No	No	No	No	No	
15	23	26	No	No	No	No	No	No	No	No	No	No	
16	19	22	Yes	Yes	No	No	No	No	No	No	No	No	
17	16	19	Yes	Yes	No	Yes	No	No	No	No	No	No	
18	15	18	No	No	Yes	Yes	No	No	No	No	No	No	
19	24	27	No	Yes	Yes	No	No	No	No	No	No	No	
20	20	23	Yes	Yes	No	Yes	Yes	No	No	No	No	No	
21	27.5	30.5	Yes	No	No	No	Yes	No	No	No	No	No	
22	24	28	No	Yes	No	No	Yes	No	No	No	No	No	
23	19	24	No	No	No	No	No	No	No	No	No	Yes	
24	21	24	Yes	Yes	No	Yes	Yes	No	No	No	Yes	No	
25	22.5	25.5	Yes	Yes	Yes	No	No	No	No	No	No	Yes	
26	16	19	Yes	Yes	No	No	Yes	No	No	No	No	No	
27	21.5	24.5	No	Yes	No	No	No	No	No	No	No	No	
28	26.5	30.5	No	No	No	No	No	No	No	Yes	No	No	
29	20	24	No	No	No	No	No	No	No	Yes	Yes	Yes	
30	19	23	Yes	Yes	Yes	No	No	Yes	No	No	No	No	
31	22	26	No	Yes	No	No	No	No	No	No	No	No	
32	25.5	29.5	Yes	Yes	No	No	No	No	Yes	No	No	No	
33	23	26	Yes	No	No	No	No	No	No	No	No	No	
34	19.5	23.5	No	Yes	No	No	Yes	No	No	No	No	No	
35	19	23	Yes	Yes	No	No	No	No	No	No	No	No	
36	27	30	Yes	Yes	Yes	No	No	No	No	No	No	No	
37	22	26	No	Yes	No	No	No	No	No	No	No	No	
38	17.5	21.5	No	Yes	No	No	Yes	No	No	No	Yes	No	
39	23.5	27.5	Yes	Yes	No	No	No	No	No	No	No	Yes	
40	20.5	23.5	No	No	Yes	No	No	Yes	No	No	No	No	
41	18.5	22.5	Yes	Yes	No	Yes	No	No	No	No	No	Yes	Bronchiectasis
42	23	27	Yes	Yes	Yes	No	No	No	No	No	No	Yes	AF, PTB
43	25.5	29.5	Yes	Yes	Yes	No	No	No	No	No	No	No	
44	22.5	25.5	No	No	Yes	No	No	No	No	No	No	Yes	Anemia
45	19.5	22.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
46	16.5	20.5	No	No	Yes	No	No	No	No	No	No	Yes	HBsAg+
47	18.5	21.5	No	No	Yes	No	No	No	No	No	No	No	
48	21.5	24.5	Yes	No	No	No	No	No	Yes	No	No	No	
49	18.5	23.5	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	PTB
50	26	29	Yes	Yes	No	No	No	No	No	No	No	No	
51	19.5	23.5	No	Yes	No	No	No	No	No	No	No	No	
52	18	22	No	No	No	No	No	No	Yes	No	No	No	
53	23.5	27.5	Yes	Yes	No	Yes	Yes	No	No	No	No	No	
54	26.5	30.5	Yes	No	No	No	No	No	No	No	No	No	
55	21	24	No	Yes	No	No	No	No	No	No	No	No	
56	17.5	21.5	No	No	No	No	No	No	No	No	No	Yes	Anemia
57	24.5	27.5	No	No	No	No	No	No	No	No	No	No	
58	19	22	No	No	No	No	No	No	No	No	No	Yes	Left Pneumonectomy
59	26	30	No	Yes	No	No	No	No	No	No	No	Yes	Parkinson, Anemia
60	22.5	26.5	No	No	No	No	No	No	No	No	Yes	Yes	AAA, Anemia
61	15.5	19.5	No	No	No	No	No	No	No	No	No	No	
62	27.5	31.5	No	No	No	No	No	No	No	No	No	Yes	PTB
63	19.5	24.5	Yes	No	No	No	No	No	No	No	No	No	
64	21.5	25.5	No	Yes	No	No	No	No	No	No	No	No	
65	28.5	32.5	No	No	No	No	No	No	No	No	No	Yes	RHD, MS/MR
66	26	30	Yes	Yes	No	No	Yes	No	No	No	No	No	
67	25.5	29.5	No	No	No	No	No	No	No	No	No	No	
68	20.5	24.5	No	Yes	No	No	No	No	No	No	No	No	
69	19	24	No	No	No	No	No	No	No	No	No	No	
70	22.5	26.5	No	Yes	No	No	No	No	No	No	No	Yes	PTB
71	26.5	30.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
72	21	26	No	Yes	No	Yes	Yes	No	No	No	No	No	
73	27	31	Yes	Yes	No	No	No	No	No	No	Yes	No	

	DRS-R-98		Medical Comorbidities										
SNo	Severity score	Total score	DM	HTN	CAD	CVA	CKD	CCF	COPD	CLD	Malignancy	Others	
74	16.5	20.5	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	PVD
75	19	24	No	No	No	No	Yes	No	No	No	No	Yes	Anemia
76	22.5	27.5	No	No	No	No	No	No	No	No	No	Yes	BA
77	20.5	24.5	No	Yes	No	No	No	No	No	No	No	No	
78	27.5	31.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
79	21.5	26.5	No	No	No	No	Yes	No	No	No	No	Yes	Anemia
80	24.5	28.5	Yes	Yes	No	No	No	No	No	No	No	No	
81	25.5	29.5	Yes	Yes	No	No	No	No	No	No	No	No	
82	17.5	22.5	No	Yes	No	No	No	No	No	No	No	No	
83	20	25	No	No	No	No	No	No	No	Yes	Yes	No	
84	25.5	30.5	Yes	Yes	No	No	No	No	Yes	No	No	No	
85	21.5	24.5	Yes	Yes	No	No	No	No	No	No	No	No	
86	21	25	No	No	No	No	No	No	No	No	No	No	
87	18.5	23.5	Yes	Yes	No	No	No	No	No	No	No	No	
88	26	31	Yes	Yes	No	No	No	No	No	No	No	Yes	Parkinson
89	20.5	25.5	Yes	Yes	No	No	No	No	No	No	No	Yes	Anemia
90	27.5	32.5	Yes	No	No	No	No	No	No	No	No	No	
91	24.5	28.5	No	No	No	No	No	No	No	No	No	No	
92	19.5	24.5	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	Parkinson, seizure disorder
93	21	26	Yes	Yes	No	No	No	No	No	No	No	Yes	PTB, BPH
94	25.5	29.5	No	No	No	No	No	No	No	No	No	No	
95	18	23	No	No	Yes	No	No	Yes	Yes	No	No	No	
96	19	24	No	No	Yes	No	No	Yes	Yes	No	No	No	
97	25.5	29.5	Yes	No	No	No	No	No	No	Yes	No	Yes	Hepatic encephalopathy
98	17.5	22.5	Yes	Yes	Yes	No	Yes	No	No	No	No	No	
99	28	32	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Cor pulmonale
100	26	30	No	No	No	No	No	No	No	Yes	No	Yes	Portal HTN, Hepatic encephalopathy
101	21	25	Yes	Yes	Yes	No	Yes	No	No	No	No	No	
102	26.5	30.5	Yes	No	No	No	No	No	No	No	No	Yes	Depression
103	23.5	27.5	Yes	Yes	No	No	Yes	No	No	No	No	Yes	Anemia
104	26	31	No	Yes	No	No	Yes	No	No	No	No	No	
105	20.5	25.5	No	No	Yes	No	No	Yes	No	No	No	No	
106	25	29	No	Yes	No	No	Yes	No	No	No	No	No	
107	26.5	30.5	No	Yes	No	Yes	No	No	No	No	No	Yes	PTB
108	19.5	24.5	Yes	Yes	Yes	No	No	No	No	No	No	No	
109	15.5	19.5	No	No	No	No	Yes	No	No	No	No	Yes	HBsAg+
110	23.5	27.5	No	Yes	No	No	Yes	No	No	No	No	No	
111	27	31	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	
112	21.5	24.5	No	No	No	No	No	No	No	No	No	No	
113	21	25	No	No	No	No	No	No	No	No	Yes	Yes	HUN
114	23.5	28.5	Yes	No	No	No	No	No	No	No	No	No	
115	22	27	Yes	No	Yes	No	No	No	No	No	No	No	
116	24	29	Yes	No	No	No	No	No	No	No	No	No	
117	17	22	No	Yes	No	No	No	No	No	No	No	No	
118	20	25	No	Yes	No	No	Yes	No	No	No	No	Yes	Uremic gastritis
119	24.5	28.5	No	No	Yes	No	Yes	Yes	No	No	No	No	
120	23	29	No	Yes	No	No	No	No	No	No	No	Yes	Herpes zoster
121	16.5	21.5	No	No	No	No	No	No	Yes	No	No	No	
122	18.5	23.5	No	No	No	No	No	No	No	No	No	Yes	Anemia,Dementia
123	21	25	No	No	No	No	No	No	No	No	No	No	
124	18	23	Yes	No	Yes	No	Yes	Yes	No	No	No	No	
125	25.5	29.5	No	No	No	No	No	No	Yes	No	No	No	
126	23.5	28.5	No	Yes	No	No	Yes	No	No	No	No	Yes	Anemia
127	19	24	Yes	Yes	No	No	No	No	No	No	No	Yes	Anemia,OA Knees, Paraparesis
128	20	25	No	Yes	No	Yes	Yes	No	No	No	No	No	
129	23	28	No	No	No	No	No	No	Yes	No	No	Yes	PTB
130	16.5	21.5	Yes	No	Yes	Yes	No	Yes	No	No	No	Yes	Dementia
131	19.5	23.5	No	Yes	No	No	Yes	No	No	No	No	No	
132	24.5	29.5	No	No	No	No	No	No	No	No	No	No	
133	18	23	No	No	No	No	No	No	No	No	No	No	
134	27.5	32.5	Yes	Yes	No	No	Yes	No	No	No	No	Yes	(R)AK Knee amputation
135	19	24	Yes	Yes	No	No	No	No	No	No	No	Yes	Dyslipidemia
136	23.5	28.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
137	17.5	22.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
138	19	24	Yes	Yes	No	No	No	No	No	No	No	No	
139	16	21	No	Yes	No	No	No	No	No	No	No	No	
140	24.5	29.5	No	Yes	No	No	No	No	No	No	No	No	
141	19.5	23.5	No	No	No	No	Yes	No	No	No	Yes	Yes	HUN
142	17	22	Yes	Yes	No	No	No	No	No	No	No	No	
143	28	33	No	No	Yes	No	No	No	No	No	No	No	

	DRS-R-98		Medical Comorbidities										
SNo	Severity score	Total score	DM	HTN	CAD	CVA	CKD	CCF	COPD	CLD	Malignancy	Others	
144	20	24	Yes	Yes	No	No	No	No	No	No	No	No	
145	19.5	24.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
146	20	25	Yes	Yes	No	Yes	No	No	No	No	No	No	
147	16.5	21.5	Yes	Yes	Yes	No	No	Yes	No	No	No	No	
148	27.5	31.5	Yes	Yes	No	No	No	No	No	No	No	No	
149	29	34	No	Yes	Yes	No	No	No	No	No	No	No	
150	25	29	Yes	Yes	Yes	No	No	No	No	No	No	No	
151	19	23	No	Yes	No	No	No	No	No	No	No	Yes	OSA
152	20.5	24.5	No	No	No	No	No	No	No	No	No	Yes	Post traumatic seizure/Diffuse axonal injury
153	24	28	No	Yes	Yes	No	Yes	No	No	No	No	No	
154	18.5	23.5	Yes	No	No	No	No	No	No	No	No	Yes	Caries spine
155	23.5	28.5	Yes	Yes	Yes	No	No	No	No	No	No	No	
156	20	25	Yes	Yes	Yes	No	Yes	No	No	No	Yes	Yes	Anemia
157	27	31	No	Yes	No	No	No	No	No	No	No	No	
158	17	21	No	Yes	No	No	No	No	No	No	No	No	
159	19.5	24.5	Yes	No	No	No	No	No	No	No	No	No	
160	23	28	No	No	No	Yes	Yes	No	No	No	No	No	
161	19	23	Yes	Yes	No	Yes	No	No	No	No	No	No	
162	23.5	27.5	No	Yes	No	No	No	No	No	No	No	Yes	Cervical spondylosis
163	15	19	Yes	Yes	No	No	No	No	No	No	No	Yes	Parkinson
164	18	23	Yes	Yes	No	No	No	No	No	No	No	Yes	PTB
165	20.5	24.5	No	Yes	No	No	No	No	No	No	No	No	
166	18.5	22.5	Yes	Yes	Yes	No	No	No	No	No	No	No	
167	26.5	30.5	No	No	No	No	No	No	No	No	Yes	No	
168	20	24	Yes	Yes	No	No	Yes	No	No	No	No	Yes	Intertrochanteric # femur, AF
169	21	25	Yes	Yes	Yes	No	No	No	No	No	No	No	
170	20.5	24.5	No	No	No	No	No	No	No	No	No	No	
171	27	31	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No	
172	19	24	No	No	Yes	No	Yes	No	No	No	No	No	
173	25	29	Yes	Yes	No	No	No	No	No	No	Yes	Yes	Intertrochanteric # femur
174	16	20	No	No	No	No	No	No	No	No	No	No	
175	15	20	Yes	Yes	No	No	No	No	No	No	No	Yes	Hypothyroidism, Parkinson
176	22	26	No	No	No	No	No	No	No	No	No	No	
177	23	28	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Rheumatoid arthritis
178	19	24	Yes	No	Yes	No	Yes	No	No	No	No	Yes	Hypothyroidism, Anemia
179	18.5	23.5	No	Yes	No	Yes	No	No	No	No	No	No	
180	16.5	20.5	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Hypothyroidism
181	20	24	Yes	Yes	Yes	No	No	Yes	No	No	No	No	
182	17	22	No	No	Yes	No	No	Yes	No	No	No	Yes	Gastritis, LBBB
183	25	29	Yes	Yes	No	No	Yes	No	No	No	No	Yes	PTB
184	18	23	No	Yes	No	No	No	No	No	No	No	Yes	Parkinson disease
185	19.5	23.5	Yes	No	Yes	No	No	Yes	No	No	No	No	
186	23.5	27.5	Yes	No	Yes	No	Yes	No	No	No	No	No	
187	25	29	Yes	Yes	No	No	No	No	No	No	No	Yes	Left filiarial leg
188	20	24	No	Yes	No	No	Yes	No	No	No	No	Yes	Anemia
189	26	31	No	No	No	Yes	No	No	No	No	No	No	
190	23	28	Yes	Yes	No	No	No	No	No	No	No	Yes	Parkinson disease
191	25	29	No	Yes	Yes	No	No	Yes	Yes	No	No	No	
192	18	23	No	No	No	Yes	No	No	Yes	No	No	No	
193	23	27	Yes	Yes	No	No	Yes	No	No	No	No	Yes	AF
194	20	24	No	Yes	No	No	No	No	No	No	No	No	
195	22	27	Yes	No	No	No	No	No	No	No	No	No	
196	26	31	Yes	Yes	No	No	No	No	No	No	No	No	
197	19	23	Yes	No	No	No	No	No	No	No	No	Yes	Parkinson disease
198	26	31	Yes	Yes	No	No	No	No	No	No	No	Yes	Hypothyroidism
199	27	32	No	No	No	No	No	No	No	No	No	Yes	Post polio syndrome, Parkinson disease, Hypothyroidism
200	24	29	Yes	No	No	No	No	No	Yes	No	No	No	
201	20	25	No	No	No	No	No	No	No	No	No	No	
202	26	31	Yes	Yes	No	No	No	No	No	No	No	No	
203	26	31	Yes	No	No	No	No	No	No	No	No	No	
204	22	27	No	No	No	No	No	No	No	No	No	No	
205	25	30	No	Yes	No	Yes	No	No	No	No	No	Yes	dementia
206	20	25	No	No	No	No	No	No	No	No	Yes	Yes	dementia
207	18	23	No	No	No	No	No	No	No	No	No	No	

	DRS-R-98		Medical Comorbidities										
SNo	Severity score	Total score	DM	HTN	CAD	CVA	CKD	CCF	COPD	CLD	Malignancy	Others	
208	22	27	Yes	No	No	No	No	No	No	No	No	No	
209	18	23	No	No	No	No	No	No	No	No	No	No	
210	19	23	Yes	Yes	No	No	No	No	No	No	No	No	
211	16.5	21.5	No	No	No	No	No	No	No	No	No	No	
212	23	28	No	No	No	No	No	No	No	No	No	No	
213	25	30	No	No	No	No	No	No	No	Yes	No	No	HbsAg+
214	17	22	No	No	No	No	No	No	No	No	No	No	
215	23	28	No	No	No	No	No	No	No	No	No	No	
216	20	25	No	No	No	No	No	No	No	No	No	No	
217	22.5	27.5	Yes	No	Yes	No	No	No	No	No	No	No	
218	24	28	No	No	No	Yes	No	No	No	No	No	No	
219	23	28	No	No	No	No	No	No	No	No	No	No	
220	20	25	No	No	No	No	No	No	No	No	No	No	
221	22	27	Yes	No	No	Yes	No	No	No	No	No	No	
222	20	25	Yes	Yes	No	No	Yes	No	No	No	No	No	
223	24	29	No	No	No	No	No	No	No	No	No	No	
224	19	24	No	No	No	No	Yes	No	No	No	No	No	
225	21.5	25.5	No	No	No	No	Yes	No	No	No	No	Yes	PTB
226	19.5	24.5	No	No	No	No	No	No	No	No	No	Yes	Bronchiectasis, AF
227	21	25	No	No	No	No	No	No	No	No	No	No	
228	16.5	21.5	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
229	21.5	25.5	Yes	No	No	No	Yes	No	No	No	No	No	
230	17.5	22.5	No	Yes	No	Yes	No	No	No	No	No	No	
231	25	30	No	No	No	No	Yes	No	No	No	No	No	
232	22	27	No	No	No	No	No	No	No	No	No	No	
233	23	28	No	Yes	Yes	No	No	No	No	No	No	Yes	PTB
234	24	29	No	No	No	No	No	No	No	No	No	No	
235	23	28	Yes	No	No	No	No	No	No	No	No	No	
236	19.5	23.5	No	Yes	No	No	No	No	No	No	No	No	
237	25	30	No	No	No	No	No	No	No	No	No	No	
238	20	25	No	No	No	No	No	No	No	No	No	No	
239	26	31	No	No	No	No	No	No	Yes	No	No	Yes	Cor pulmonale
240	23	28	No	No	No	No	No	No	Yes	No	No	No	
241	25	30	No	Yes	No	Yes	No	No	No	No	No	Yes	PTB
242	19	24	No	No	No	No	No	No	No	No	No	No	
243	17.5	22.5	No	No	No	No	No	No	No	No	No	No	
244	20	25	No	No	No	No	No	No	No	No	No	Yes	Parkinson disease
245	25	30	No	No	No	No	No	No	No	No	No	No	
246	22	27	No	No	No	No	No	No	No	No	No	No	
247	21	26	No	No	No	No	No	No	No	No	No	Yes	CERVICAL spondylosis
248	20.5	24.5	No	No	No	Yes	No	No	No	No	No	No	
249	26	31	Yes	No	No	No	Yes	No	No	No	No	No	
250	22	26	No	No	No	No	Yes	No	No	No	No	Yes	BPH
251	23	28	Yes	Yes	Yes	No	No	Yes	No	No	No	No	
252	19.5	24.5	No	No	No	No	No	No	Yes	No	No	No	
253	19	24	Yes	No	No	No	No	No	No	No	No	No	
254	18	23	No	No	No	No	No	No	No	No	Yes	No	
255	21	26	Yes	No	No	No	No	No	No	No	No	No	
256	22	27	Yes	No	No	No	No	No	No	No	No	No	
257	26	31	No	No	Yes	No	No	Yes	No	No	No	No	
258	19	24	No	No	No	No	Yes	No	No	No	Yes	No	
259	17.5	22.5	Yes	No	No	No	No	No	No	No	No	Yes	Parkinson disease
260	24	29	No	Yes	Yes	No	No	No	Yes	No	No	Yes	LBBB
261	20	24	No	Yes	No	No	No	No	No	No	No	No	
262	25	30	Yes	Yes	No	No	No	No	No	No	No	No	
263	24	29	Yes	No	No	No	No	No	No	No	No	No	
264	19	24	No	No	No	Yes	No	No	No	No	No	Yes	Vascular dementia
265	21	26	No	No	Yes	No	No	Yes	No	Yes	No	No	
266	16	21	No	No	No	Yes	No	No	No	No	No	No	
267	20	25	Yes	No	No	No	No	No	No	No	No	Yes	PTB
268	19	24	No	No	No	No	No	No	No	No	No	Yes	PTB
269	21	26	No	No	No	No	No	No	No	Yes	No	No	HbsAg+
270	23	28	No	No	No	No	No	No	No	No	No	No	
271	24	29	No	No	No	No	Yes	No	Yes	No	No	No	
272	27	31	No	No	No	No	No	No	No	No	No	No	
273	29	33	No	No	No	No	No	No	Yes	No	No	No	
274	19.5	24.5	Yes	Yes	No	No	No	No	No	No	No	Yes	EDH
275	24.5	29.5	Yes	Yes	No	No	Yes	No	No	No	Yes	No	
276	25	29	Yes	No	No	No	No	No	No	Yes	No	Yes	PTB, Portal HTN, Hepatic encephalopathy, HBsAg+
277	20.5	24.5	Yes	No	No	No	Yes	No	No	No	No	Yes	RHD, MS(MVR), AF with CVR

	DRS-R-98		Medical Comorbidities										
SNo	Severity score	Total score	DM	HTN	CAD	CVA	CKD	CCF	COPD	CLD	Malignancy	Others	
278	27.5	32.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
279	26	30	No	Yes	No	Yes	No	No	No	No	No	Yes	PTB, Cor pulmonale
280	20.5	25.5	Yes	Yes	No	No	No	No	No	No	No	No	
281	18	23	No	Yes	No	Yes	No	No	No	No	No	Yes	Seizure disorder, left # clavicle
282	19.5	24.5	No	No	Yes	No	No	No	No	No	No	Yes	AF with CVR
283	17	22	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
284	19.5	23.5	Yes	Yes	No	No	Yes	No	No	No	No	No	
285	27	31	Yes	Yes	No	No	No	No	No	No	No	No	
286	18	23	No	No	No	No	Yes	No	No	No	No	No	
287	27	31	Yes	No	No	No	No	No	No	No	No	No	
288	19.5	24.5	No	Yes	No	No	No	No	No	No	No	No	
289	25	29	Yes	No	No	No	No	No	Yes	No	No	No	
290	20.5	24.5	No	No	No	No	No	No	No	No	No	Yes	Traumatic paraplegia
291	20	24	No	Yes	No	No	Yes	No	No	No	No	Yes	Hypothyroidism
292	17.5	22.5	No	Yes	No	No	No	No	No	No	No	No	
293	25.5	29.5	Yes	Yes	Yes	Yes	No	No	No	No	No	No	
294	28	32	No	No	No	No	No	No	No	No	No	No	
295	19	23	No	Yes	Yes	No	No	Yes	No	No	No	No	
296	24.5	28.5	Yes	Yes	No	Yes	No	No	No	No	No	Yes	PTB
297	20.5	25.5	No	Yes	Yes	No	No	Yes	No	No	No	No	
298	28.5	32.5	No	No	No	Yes	Yes	No	No	No	No	Yes	Anemia
299	25.5	29.5	Yes	Yes	No	No	No	No	No	No	No	No	
300	18.5	22.5	No	Yes	Yes	Yes	No	Yes	No	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
1	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
2	No	No	Yes	No	No	No	No	No	No	No	No	No	No	
3	Yes	No	No	No	No	No	No	No	Yes	Yes	No	No	No	
4	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No	
5	Yes	No	No	No	No	No	No	No	No	No	Yes	No	Yes	
6	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	
7	No	Yes	No	No	No	No	No	No	No	Yes	No	No	Yes	
8	Yes	No	No	Yes	No	No	No	No	No	Yes	No	No	No	
9	No	No	No	No	No	No	No	No	No	No	No	No	No	
10	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
11	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
12	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
13	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
14	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
15	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	Yes	
16	Yes	No	No	Yes	No	No	No	No	No	No	No	No	Yes	
17	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	
18	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	
19	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
20	No	No	No	No	Yes	No	No	No	No	Yes	No	No	Yes	
21	No	No	No	Yes	No	No	No	No	No	No	No	No	No	
22	No	Yes	No	No	No	No	No	No	No	Yes	No	No	Yes	
23	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	
24	No	No	No	No	No	No	No	No	No	No	No	No	No	
25	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	
26	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
27	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
28	No	No	No	No	No	No	No	No	No	No	No	No	No	
29	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
30	No	No	No	No	No	Yes	No	No	No	No	No	No	No	
31	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	
32	No	No	Yes	No	No	Yes	No	No	No	No	Yes	No	Yes	
33	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	
34	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	
35	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
36	Yes	No	No	No	No	No	No	No	Yes	Yes	No	No	No	
37	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	
38	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
39	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	
40	No	No	No	No	No	Yes	No	No	No	No	No	No	No	
41	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
42	Yes	No	N	No	No	No	No	No	No	No	No	No	No	
43	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	
44	Yes	No	No	No	No	Yes	No	No	No	No	No	No	No	
45	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
46	Yes	No	No	Yes	No	No	No	No	No	Yes	No	No	No	
47	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	
48	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No	No	
49	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
50	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
51	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	
52	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	
53	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	
54	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	
55	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
56	No	No	No	Yes	No	No	No	No	No	Yes	No	No	Yes	
57	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	
58	Yes	No	No	No	No	Yes	No	No	No	No	No	No	No	
59	No	No	No	Yes	No	No	No	Yes	No	No	No	No	Yes	
60	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
61	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	
62	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	No	
63	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	
64	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
65	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
66	No	Yes	No	No	No	No	No	No	Yes	No	No	No	Yes	
67	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	
68	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
69	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
70	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
71	No	Yes	No	No	No	No	No	No	Yes	No	No	No	Yes	
72	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
73	Yes	No	No	No	No	No	No	Yes	No	No	No	No	No	
74	No	No	Yes	No	No	Yes	Yes	No	No	Yes	No	No	No	
75	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	
76	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
77	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
78	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	
79	No	No	Yes	No	No	No	No	No	No	No	Yes	No	Yes	
80	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
81	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	
82	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	
83	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	
84	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
85	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
86	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
87	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No	No	
88	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
89	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	
90	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
91	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	
92	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
93	No	No	Yes	No	No	No	No	No	No	No	No	No	No	
94	No	No	No	No	No	No	Yes	No	No	No	No	No	No	
95	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	
96	No	No	No	No	No	No	No	No	No	No	No	No	No	
97	No	No	No	No	No	No	No	No	No	No	No	No	No	
98	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
99	No	No	No	No	No	No	No	No	No	No	No	No	No	
100	No	No	No	No	No	No	No	No	No	No	No	No	No	
101	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	
102	No	No	No	No	No	No	No	No	No	No	No	No	No	
103	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	
104	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
105	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
106	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
107	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
108	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
109	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	
110	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
111	No	No	No	No	No	No	No	No	No	No	No	No	No	
112	No	No	No	Yes	No	No	No	No	No	No	Yes	No	Yes	
113	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
114	No	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes	
115	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
116	No	Yes	No	Yes	No	No	No	No	No	No	No	No	Yes	
117	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
118	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
119	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
120	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
121	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
122	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
123	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	
124	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	
125	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
126	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	
127	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	
128	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
129	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
130	Yes	No	No	No	No	No	No	Yes	No	No	No	No	No	
131	Yes	No	No	No	No	Yes	No	No	No	No	No	No	No	
132	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
133	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
134	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
135	No	No	No	No	No	No	Yes	No	No	No	No	No	No	
136	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	
137	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
138	Yes	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	
139	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
140	No	No	No	No	Yes	No	No	No	No	No	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
141	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
142	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
143	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
144	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
145	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	
146	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	
147	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	
148	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	Yes	
149	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
150	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
151	No	No	Yes	No	No	No	No	No	No	No	No	No	No	
152	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
153	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
154	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	Yes	
155	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
156	No	No	Yes	No	Yes	No	No	No	No	No	No	No	No	
157	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
158	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	
159	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	
160	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	
161	No	Yes	No	No	Yes	No	Yes	No	No	No	No	No	No	
162	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
163	Yes	No	Yes	No	No	No	Yes	No	No	No	No	No	No	
164	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
165	No	No	No	Yes	No	No	No	No	No	No	No	No	No	
166	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
167	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
168	Yes	No	Yes	No	No	No	No	No	No	No	No	No	Yes	
169	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
170	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	
171	No	No	No	No	No	No	No	No	No	No	No	No	No	
172	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
173	No	No	Yes	No	No	No	No	No	No	No	No	No	No	
174	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
175	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
176	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
177	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	
178	No	No	No	No	No	Yes	No	No	No	No	No	No	No	
179	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
180	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
181	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
182	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
183	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	
184	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	
185	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	
186	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No	
187	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No	
188	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
189	No	No	No	No	No	No	No	No	No	No	No	No	No	
190	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
191	No	No	No	No	No	No	No	No	No	No	No	No	No	
192	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	
193	No	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	
194	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	
195	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	
196	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	
197	No	No	Yes	No	No	No	No	No	No	No	No	No	No	
198	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	
199	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
200	Yes	No	No	Yes	No	No	No	No	No	Yes	No	No	No	
201	No	No	No	No	No	Yes	No	No	No	No	No	No	No	
202	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	
203	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	
204	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
205	No	Yes	No	No	Yes	No	No	No	No	Yes	No	No	No	
206	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
207	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
208	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
209	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
210	No	No	No	No	Yes	No	No	No	No	No	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
211	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	
212	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	
213	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
214	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
215	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
216	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
217	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
218	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
219	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
220	Yes	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
221	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	
222	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
223	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
224	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	
225	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
226	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
227	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	
228	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No	No	
229	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
230	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
231	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	
232	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
233	No	No	No	No	No	No	No	No	No	No	No	No	No	
234	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
235	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	
236	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
237	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
238	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
239	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
240	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	
241	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
242	Yes	No	No	Yes	No	No	No	No	No	Yes	No	No	Yes	
243	Yes	No	No	Yes	No	No	No	No	Yes	No	No	No	Yes	
244	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	
245	Yes	No	No	No	No	No	No	No	No	No	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
246	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
247	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	
248	Yes	No	No	No	Yes	No	No	No	No	Yes	No	No	No	
249	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	
250	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
251	No	Yes	No	Yes	No	No	No	No	Yes	No	No	No	No	
252	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
253	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	Yes	
254	No	No	No	No	No	No	No	No	No	Yes	No	No	No	
255	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	
256	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	No	
257	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
258	Yes	Yes	Yes	No	No	No	No	No	No	Yes	No	No	Yes	
259	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
260	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
261	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
262	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
263	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	
264	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
265	No	No	No	No	No	Yes	Yes	No	No	Yes	No	No	No	
266	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
267	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	
268	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
269	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
270	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	
271	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
272	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
273	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
274	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
275	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	
276	No	No	No	No	No	No	No	No	No	No	No	No	No	
277	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
278	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	
279	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
280	Yes	No	No	No	No	No	No	Yes	No	No	No	No	No	

S.No	Precipitating factors													
	Infection				Vascular			Metabolic						
	Respiratory	UTI	Skin/ Subcutaneous	Others	CVA	ACS	Others	Hypoglycemia	Hyperglycemia	Hyponatremia	Hypernatremia	Hypercalcemia	uremia	
281	No	No	No	No	No	No	No	No	No	No	No	No	No	
282	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	
283	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	
284	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	
285	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No	
286	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	
287	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	
288	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
289	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
290	No	No	Yes	No	No	No	No	No	No	No	No	No	No	
291	No	No	No	No	No	No	No	No	No	No	No	No	Yes	
292	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	
293	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
294	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	
295	No	No	No	No	Yes	No	No	No	No	No	No	No	No	
296	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	
297	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	
298	No	No	No	No	No	No	No	No	No	No	No	No	No	
299	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No	
300	Yes	No	No	No	No	No	No	No	No	No	No	No	No	

.