Delirium in Elderly General Medicine Inpatients: A Prospective Study

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Abstract

Objective: To study all aspects of delirium including occurrence, risk factors, precipitating causes and outcome in tertiary care hospital catering geriatric medicine services.

Methods: A prospective observational study was done among 100 cases of delirium recruited from 520 patients admitted in geriatric block of general medicine ward during a calendar year. Patients were screened for delirium by confusion assessment method. Prevalent delirium and incident delirium was calculated. A set of predisposing risk factors were sought on admission. The cause of delirium was ascertained after full evaluation of patients by taking history, doing physical examination including neurological examination and appropriate investigations. Outcomes were measured in terms of length of hospital stay and inpatient mortality.

Results: Out of 520 patients admitted in Geriatric ward during the study period, 100 patients had delirium (study prevalence 19.23%) and out of these, 7 patients developed delirium during hospitalization (study incidence 1.34%). The most common precipitating causes of delirium was infections (41%), followed by stroke (17%) and electrolyte imbalance (11%). Among infections, UTI was the most common cause. The most common predisposing risk factors for delirium were infections (52%), sensory impairment (51%), immobility/being bedridden (40%), incontinence (32%), hypoxia (29%), electrolyte disturbances (hyponatremia- 22%), dehydration (21%), and poly pharmacy (15%). At the end of the study, mortality was 24% and 38 (38%) patients were recovered from the delirium.

Conclusion: Delirium was found in 19.23% admitted geriatric patients and associated with considerable mortality (24%). The most common precipitating and predisposing causes of delirium was infection. After effective management, 38 (38%) patients recovered from delirium and were discharged in stable condition.

Key words: delirium, elderly, risk factors, confusion assessment method, outcome

Introduction

Delirium is a common clinical syndrome characterized by disturbed consciousness, cognitive function or perception, which has an acute onset and fluctuating course. Though it is a serious condition which is associated with poor outcome, it can be prevented and treated if dealt urgently.

In geriatric patients, the prevalence of delirium at hospital admission is 18 to 35% and a new delirium develops in 11-14% of these patients.
during hospitalization. Delirium occurs as a result of interplay between various predisposing factors and precipitating events. Patients at high risk of delirium because of multiple/severe predisposing factors need minimal precipitators to provoke a delirium episode. Alternatively, a patient with few predisposing factors would require multiple/ severe triggers to provoke delirium. Delirium in hospitalized older persons was found to be associated with increased mortality, regardless of confounders such as age, sex, and comorbidities. The mortality rate associated with delirium in patients in the hospital was estimated to be 14.5% to 37%. A prolonged state of delirium is associated with poorer outcomes, including functional decline, dementia and death. When delirium remains unresolved at hospital discharge, functional and cognitive outcomes become poor.

There is a scarcity of research on delirium among elderly. Older studies included delirium under the heading of organic psychosis and showed it to be the most common diagnostic entity seen by the consultation liaison psychiatric services. Many studies have reported it to be the most common diagnosis in medically ill inpatients. Furthermore there are very few Indian studies on delirium in general medicine inpatients in comparison to studies from psychiatric services despite the fact that most delirious patients have medical illness to attribute. This is more so in the geriatric population. Hence we conducted a study in tertiary care hospital catering geriatric medicine services to explore all aspects of delirium including occurrence, risk factors, precipitating causes and outcome.

Material and Methods

A prospective observational cohort study was done among 100 admitted elderly patients (age >65 years) in Geriatric block of General Medicine Department at a tertiary care hospital during March 2016 to February 2017 after taking due approval from institutional ethics committee. The elderly (>65 years age) patients who had delirium (at the time of hospitalization or develop during hospitalization) were included in the study after written informed consent from legal relatives. The delirium was diagnosed as per Confusion Assessment Method. Patients who required ventilator support and whose relatives refused to give consent were excluded from the study. For each patient, history was obtained from a reliable informant to establish the patient’s baseline cognitive function and the time course of mental status change and to assess clues about potential predisposing and precipitating factors (as listed in Table no.1). After taking history, complete physical examination including evaluation for delirium was conducted. From each patient, venous blood sample was collected and sent for laboratory evaluation including complete blood count, peripheral blood smear, erythrocyte sedimentation rate, random blood glucose, renal and liver function tests, serum electrolytes, serum calcium and serum phosphorus. Arterial blood gas analysis and electrocardiography were also performed. To search for occult infection chest radiography, abdominal USG and selected cultures as indicated by clinical state of patient were done. When no obvious cause was revealed after these steps, further targeted evaluation was done tailored to the individual situation including thyroid function, vitamin B12 level, ammonia, magnesium, drug levels, toxicology screen, cerebrospinal fluid examination, brain imaging and electroencephalography.

The outcome of the delirium patients was measured in terms of mortality and duration of hospital stay.

Confusion Assessment Method: This method was used to diagnose delirium based on presence of criteria 1 and 2 with either 3 or 4 of the following.

1. Acute onset and fluctuating course: Is there evidence of an acute change in mental status from the patient’s baseline? Did this behavior fluctuate during the past days (that is, did it tend to come and go or increase and decrease in severity)?

2. Inattention: Does the patient have difficulty focusing attention; for example, being easily distracted or having difficulty keeping track of what was being said?

3. Disorganized thinking: Is the patient’s speech disorganized or incoherent; for example rambling or irrelevant conversation, unclear or illogical flow of ideas or unpredictable switching from subject to subject.

4. Altered level of consciousness: Overall patient’s level of consciousness: alert (normal); vigilant (hyper alert); lethargic (drowsy, easily aroused); stupor (difficult to arouse); coma (unarousable)?

Statistical analysis

Microsoft Excel and SPSS 17.0 for Windows were used for data storage and analysis. Continuous variables were expressed as mean ± standard deviation and categorical variables were expressed as absolute or relative frequencies (percentages).
Results

In this study of 100 patients with delirium, male: female ratio was 13:12 with mean age 73.38 years (range 65-92 years).

Out of 520 patients admitted in Geriatric ward during the study period, 100 patients had delirium (study prevalence 19.23%). Out of these 100 patients, 93 patients (17.88%) were found to have delirium at the time of admission and 7 patients developed delirium during hospitalization (study incidence 1.34 %). Sixty nine (69%) cases had hypoactive delirium with 27 (27%) cases of hyperactive delirium and remaining 4 (4%) were of mix delirium (Table 1).

Table 1. Type of delirium in study population

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Patients n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoactive</td>
<td>69(69)</td>
</tr>
<tr>
<td>Hyperactive</td>
<td>27(27)</td>
</tr>
<tr>
<td>Mix</td>
<td>4(4)</td>
</tr>
</tbody>
</table>

Table 2. Precipitating causes of delirium in study population

<table>
<thead>
<tr>
<th>Cause</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td>41</td>
</tr>
<tr>
<td>UTI</td>
<td>16</td>
</tr>
<tr>
<td>Malaria</td>
<td>9</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>9</td>
</tr>
<tr>
<td>Sepsis</td>
<td>3</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>3</td>
</tr>
<tr>
<td>Dengue</td>
<td>1</td>
</tr>
<tr>
<td>Stroke</td>
<td>17</td>
</tr>
<tr>
<td>Dyselectrolytemia</td>
<td>11</td>
</tr>
<tr>
<td>Anemia</td>
<td>6</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>5</td>
</tr>
<tr>
<td>CAD</td>
<td>6</td>
</tr>
<tr>
<td>Hypertensive encephalopathy</td>
<td>4</td>
</tr>
<tr>
<td>Seizure disorder</td>
<td>4</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>2</td>
</tr>
<tr>
<td>Brain tumor</td>
<td>2</td>
</tr>
<tr>
<td>Fracture</td>
<td>2</td>
</tr>
</tbody>
</table>

The most common precipitating causes of delirium were infections (41%) followed by stroke (17%) and electrolyte imbalance (11%). Among infections, UTI was the most common cause (Table 2).

The most common predisposing risk factors for delirium were infections (52%), sensory impairment (51%), immobility/bedridden (40%), incontinence (32%), hypoxia (29%), electrolyte disturbances (dyselectrolytemia-hyponatremia-11%), dehydration (21%), and poly pharmacy (15%). (Figure 1)

At the end of the study, mortality was 24% and 38 (38%) patients were recovered from delirium and were discharged in stable condition. The relatives of the remaining 38 patients (38%), left the hospital with their patient despite delirium, against the medical advice. (Figure 2)

Discussion

Delirium detected in 19.23% of our cohort which is comparable to previous studies in older inpatients.7-10 In this study, 69% patients were of hypoactive delirium, 27% patients were of hyperactive delirium and 4% were of mix delirium. The possible explanation for high numbers of hypoactive delirium in our study than other studies could be that hypoactive delirium is an under diagnosed condition which might be overlooked sometimes and patients with hyperactive delirium had agitated behavior for which are often taken to psychiatry services directly.11-15 The pathogenesis of delirium includes disruption of large scale neuronal networks in the brain due to interacting biologic factors. Some of the leading proposed mechanisms include disruption in neurotransmitter systems, inflammation, physiologic stressors, metabolic derangements, electrolyte and acid-base disorders and genetic factors.3

Risk Factors

In our study, common predisposing risk factors were infection (52%), sensory impairment (51%), immobility/bedridden (40%), incontinence (32%), hypoxia (29%), electrolyte disturbances (22%), dehydration (21%) and poly pharmacy (15%). Risk factors for development of delirium are diverse and depends on type of delirium (incidence/prevalence), study setting and variable studies. As most of our patients had prevalent delirium risk factors significantly associated with incident delirium like dementia or cognitive impairment, physical restraints, poly pharmacy, urinary catheterization, iatrogenic event, prolonged hospital stay are less pronounced in our study. Other risk factor significant in our study is in consistency with various previous studies.8,16-18
Similar to our study, variously reported predisposing factors in delirious patients include use of physical restraints, malnutrition, polypharmacy, use of bladder catheter, vision impairment, severe illness, cognitive impairment, dehydration, alcohol abuse, advanced age (>70 years), comorbidity burden, diminished activities of daily living, immobility and malnutrition.\(^8,16-18\)

**Precipitating Cause**

In our study most common precipitating causes of delirium in 100 patients were infection (41%) followed by stroke (17%) and dyselectrolytemia (11%). Among infections, UTI was the most common cause. As these are common treatable conditions and may primarily present as delirium more so in elderly patients: they should be suspected and identified in time to manage appropriately and urgently to improve the outcome. Similar to this study, previous reports also had shown the most common precipitating cause of delirium to be infection, stroke and metabolic disturbances.\(^23-36\)

**Outcome**

Mortality of delirious patients in our study is 24%. A systemic review of in hospital mortality rate among delirium cases was found to be 14.5%-37% mortality.\(^7\) An Indian study found 12.4% inpatient mortality with delirium.\(^19\)

In our study, median stay in general medicine ward of tertiary care hospital of 100 elderly delirious patients was 4 days (95% CI 4.0 to 5.0). Various studies reported 4-7 days of hospital stay in delirium patients.\(^20-22\)

Our finding of mortality and length of hospital stay are consistent with results of previous studies.\(^7,19\) So these views signify that delirium is a potentially modifiable risk factor for adverse outcomes.

A significant number of patients (38%) in our study left the hospital with delirium against medical advice due to various factors including financial burden on the family members, lack of appropriate attendant, stress of caregiver and most importantly a common myth about delirium as "terminal illness" with unfruitful outcome. The absence of clinical follow up of these patients limited the opportunity to explore the actual final outcome in terms of morbidity and mortality.

**Limitations**

This was a prospective study so its result cannot be interpreted as in a case control study. Also this study was a single center study conducted at a tertiary care referral hospital so the result may not imply on general population.

**Conclusion**

Delirium was found in 19.23% admitted geriatric patients and associated with considerable mortality (24%). The common precipitating and predisposing causes of delirium was infection. After effective management, 38 (38%) patients were recovered from the delirium and discharged in a stable condition.

Delirium is largely preventable and potentially treatable condition if dealt promptly. Early consultation with geriatrician to assess this complex phenomenon maybe helpful for better outcome in geriatric population.

**References**

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