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Geriatric Delirium: Cognitive and Neurological Impairments Linked to Polypharmacy

Bhavna Kakkar*

*Decision Neuro Advantix, Gujarat, India.

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***Corresponding Author:** Dr. Bhavna Kakkar, Decision Neuro Advantix, Gujarat, India.

Abstract

This case study examines an 80-year-old female patient, identified as RK, who developed delirium due to polypharmacy, underlying medical conditions, and the stress associated with intensive care unit (ICU) hospitalization. The report provides detailed information on symptom onset, medical history, symptom progression, and the treatment administered from admission to the current state.

Keywords: Hyponatremia, cognitive distortion, memory distortion, depersonalization, derealization, hyperactivity, hypoactivity, hallucinations, consciousness, generalized anxiety disorder.

Case Presentation

RK, an 80-year-old female resident of Rupnagar, Punjab, resides with her daughter and two grandchildren. Her husband passed away in 2012, and her three other children live separately. To maintain confidentiality, RK's identity remains anonymized, and specific medication details are withheld.

RK was brought to Parmar Hospital's emergency department after losing consciousness. Upon arrival, she exhibited pallor and minimal responsiveness, with disheveled attire and an odor of urine. The emergency team, comprising a general medicine physician and an orthopedic specialist, diagnosed a hip fracture and severe hyponatremia, necessitating immediate admission to the ICU.

Informed Consent

Informed consent was obtained from RK and her family for all treatments and procedures. The family was thoroughly informed about RK's condition, the potential risks and benefits of the proposed treatments, and their consent was documented. They agreed to the

management plan, ensuring that RK's dignity and autonomy were respected throughout her care.

Literature Review

A comprehensive review of the recent literature highlights several pertinent findings regarding delirium in elderly patients:

Bellelli et al. (2016) conducted a nationwide study in Italy, finding that delirium is a common and often underdiagnosed condition in elderly hospitalized patients, emphasizing the need for systematic screening tools.

Inouye, Westendorp, and Saczynski (2014) reviewed the multifactorial nature of delirium, underlining the interaction between predisposing factors (e.g., age, cognitive impairment) and precipitating factors (e.g., surgery, infections).

Witlox et al. (2010) highlighted the long-term consequences of delirium, including increased risks of mortality, institutionalization, and dementia, stressing the importance of early detection and management.

Vidan et al. (2009) demonstrated that integrated intervention programs within hospital settings could significantly reduce the incidence and duration of delirium, promoting better outcomes for elderly patients.

These studies underscore the complexity of delirium in the elderly and the importance of a multifaceted approach to prevention and management.

Presenting Complaints

According to RK's daughter and granddaughter, supported by medical staff reports, RK exhibited the following symptoms:

I. Memory Distortion: RK showed significant memory confusion, fixating on events from ten years ago and failing to recognize current relationships and contexts.
II. Depersonalization: She frequently lost awareness of her environment, including disorientation about time, place, and identity of familiar people.
III. Slurred Speech: Her speech clarity varied with cognitive distortion levels, often resulting in difficulty pronouncing words clearly.
IV. Derealization: RK experienced nocturnal hyperactivity, attempting to act out vivid and emotional dreams, indicating a lack of awareness of her actual surroundings.
V. Hallucinations: She experienced both visual and auditory hallucinations, particularly during the evening and night.
VI. Activity Fluctuations: During the day, RK alternated between restlessness and agitation, and a hypoactive state where she was barely responsive.

Onset and Development of Symptoms

RK's symptoms manifested following a hip fracture resulting from a fall. Prolonged immobilization and excessive analgesic use (including oral tablets and injections) contributed to visual and auditory hallucinations. She experienced misidentification of individuals and objects, such as perceiving imaginary flowers on the ceiling and observing saints walking nearby. Mismanagement of medications, including antihypertensives and anxiolytics, exacerbated her condition. Additionally, her dietary preferences, characterized by consumption of greasy, fatty, and sugary foods, contributed to metabolic disturbances, further compromising her health.

RK's substantial medication intake and suboptimal diet led to significant dehydration and electrolyte imbalances, resulting in diarrhea and frequent urination.

These factors culminated in recurrent episodes of unconsciousness, which her daughter initially misconstrued as sleep. Critically low blood oxygen levels prompted her family to seek urgent medical attention, ultimately leading to her admission to the intensive care unit (ICU).

Past Medical History

RK's medical history includes:

I. A brain haemorrhage in her early 30s, resulting in a two-month coma.
II. A hip fracture in 2010, leading to a two-month bed rest.
III. Long-term treatment for hypertension managed by a family physician for the past 15 years.
IV. Intermittent treatment for chronic knee pain by an orthopaedic specialist.
V. Habitual self-medication with painkillers without regular medical consultation.

Psychiatric History

RK's family history includes a predisposition to generalized anxiety disorders. In 2021, RK received a diagnosis of Generalized Anxiety Disorder (GAD) and was prescribed anti-anxiety medication. Unfortunately, her immobilization resulting from the hip fracture disrupted her medication regimen. Subsequent telephonic consultations with a psychiatrist led to the prescription of mild antipsychotics and anxiolytics to address hallucinations and panic symptoms.

Diagnosis

Based on the presented case, the most fitting diagnosis for RK is Delirium Due to Multiple Etiologies (DSM-5 code 293.0, ICD-10 code F05).

The DSM-5 outlines specific criteria for diagnosing delirium, which includes:

I. **Disturbance in Attention and Awareness:** RK exhibits significant fluctuations in attention and consciousness. She experiences periods of unresponsiveness, disorientation, and difficulty maintaining focus.

Change in Cognition: Clear signs of cognitive impairment are evident:

- Memory deficits
- Language disturbances (e.g., slurred speech)
- Perceptual disturbances (e.g., hallucinations)
- Cognitive distortions

II. **Rapid Onset and Fluctuating Course:** RK's symptoms emerged swiftly following her hip fracture and subsequent medication adjustments. The severity of symptoms fluctuates throughout the day.

III. **Evidence of Underlying Medical Conditions or Substance Intoxication/Withdrawal:**

- RK's delirium likely results from a combination of factors:
- Medical conditions (e.g., hyponatremia, previous brain hemorrhage, hip fracture)
- Polypharmacy (excessive use of painkillers, anti-anxiety medications)
- Potentially inadequate nutrition and hydration

CT and MRI scans were conducted to rule out other potential causes of RK's symptoms. The CT scan revealed no acute intracranial pathology, while the MRI scan showed age-related atrophy without any signs of acute infarction, supporting the diagnosis of delirium.

Medications Used in Delirium

In treating RK's delirium, several medications were

utilized:

i. Haloperidol: Administered in low doses to manage severe agitation and hallucinations.

ii. Risperidone: Used to reduce psychotic symptoms such as hallucinations.

iii. Lorazepam: Given to alleviate anxiety and manage agitation.

iv. Fluids and Electrolytes: IV saline solutions were administered to correct hyponatremia.

v. Pain Management: Non-opioid analgesics were preferred to manage pain from the hip fracture, minimizing the risk of exacerbating delirium.

Discussion

In the context of RK's case, the convergence of geriatric delirium with neurodegenerative mechanisms highlights the intricate relationship between acute cognitive disturbances and chronic neuropathology in older individuals. Several key points support the hypothesis that RK's delirium is closely linked to evolving neurodegeneration:

i. Age-Related Vulnerability:

- Advanced age renders individuals more susceptible to both delirium and neurodegenerative conditions.
- Age-associated neurobiological changes, including heightened vulnerability to inflammatory processes, oxidative stress, and medication-related effects, contribute to the prevalence of acute confusional states in geriatric populations.

ii. Pre-existing Cognitive Impairment:

- RK's medical history, particularly her prior cerebral hemorrhage, suggests pre-existing cognitive compromise.
- These antecedent neurological insults may have created a conducive environment for ongoing neurodegenerative processes.
- Coexisting hypertension and potential cardiovascular comorbidities further enhance the propensity for neurodegeneration, highlighting the multifaceted nature of cognitive decline in older adults.

iii. Symptomatology:

- RK's clinical presentation encompasses cognitive features reminiscent of both delirium and neurodegenerative syndromes, including dementia.
- The presence of memory distortions, hallucinations, and fluctuating consciousness poses a diagnostic challenge in distinguishing acute confusional states from underlying chronic cognitive impairment.
- Rigorous assessment and longitudinal surveillance are essential to unravel the etiological basis of RK's cognitive phenotype.

iv. Polypharmacy and Medication Effects:

- Chronic polypharmacy, common in geriatric care, increases the risk of cognitive decline and neurodegenerative cascades.
- Cumulative exposure to pharmacological agents, especially those affecting the central nervous system, exacerbates cognitive burden.
- Prudent medication management is crucial to mitigate cognitive sequelae and slow the progression of underlying neurodegeneration.

Conclusion

This case study illustrates the multifactorial nature of delirium in elderly patients and the necessity of a holistic approach to treatment. Given RK's acute onset of symptoms following significant medical events, her extensive use of medications, her underlying health conditions, and the characteristic cognitive and perceptual disturbances, the diagnosis of Delirium Due to Multiple Etiologies is well-supported.

Effective management requires addressing the underlying medical conditions, optimizing medication regimens, providing nutritional support, and ensuring psychological and social support to enhance recovery.

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