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SEVERE IRON-DEFICIENCY ANEMIA PRESENTING AS DELIRIUM IN AN ELDERLY FEMALE: A CASE REPORT

Dr. Vemavarapu Veera Venkata Vivek* — Final Year Postgraduate Resident, Dept. Of Psychiatry, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh *Corresponding Author

Dr. Sreelatha. P — Professor, Dept. Of Psychiatry, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh

Dr. Mitikiri Yashoda — Senior Resident, Dept .Of Psychiatry, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh

ABSTRACT Delirium is a common yet underrecognized condition in the elderly, often multifactorial in origin. Anemia, particularly severe forms, can be a precipitating factor due to resultant hypoxia. However, reports highlighting delirium due to anemia alone are scarce. We report a case of a 72-year-old female presenting with acute confusion, disorientation, and behavioural changes. On evaluation, she was found to have microcytic hypochromic anemia with haemoglobin of 7.2 g/dL. A comprehensive medical, neurological, and psychiatric workup revealed no other abnormalities. With supportive care and blood transfusion, her delirium symptoms significantly improved. This case emphasizes the need to consider severe anemia as a potential and reversible cause of delirium in the elderly, especially after excluding other common etiologies. Early identification and correction can lead to rapid cognitive and functional recovery

KEYWORDS : Cognitive impairment, Geriatric psychiatry, Microcytic hypochromic anemia, Reversible encephalopathy, Nutritional deficiency, Low hemoglobin, Non-infectious causes of delirium

INTRODUCTION

Delirium is an acute neuropsychiatric syndrome characterized by disturbances in attention, cognition, and consciousness, and is particularly prevalent among elderly patients. Among hospitalized individuals aged 65 years and older, delirium is one of the most frequently encountered complications, affecting over 2.6 million older adults annually in the United States (1). Despite its high prevalence, delirium often remains undiagnosed, with up to 60% of cases going unrecognized in clinical settings (2,3). This under recognition is particularly concerning given that delirium is not only preventable but also associated with significantly worse outcomes, including prolonged hospital stays, higher rates of institutionalization, and increased short- and long-term mortality (1,4).

Anemia is a common comorbidity among older adults, with data from the Third National Health and Nutrition Examination Survey (NHANES) indicating that it affects approximately 11.0% of men and 10.2% of women over the age of 65 in the United States, with prevalence increasing with advancing age (5,6). The World Health Organization (WHO) defines anemia as a haemoglobin level below 13 g/dL in men and 12 g/dL in women (7). In geriatric populations, anemia has been associated with increased morbidity and mortality; however, its neuropsychiatric implications, such as its potential to precipitate delirium, remain underreported and underexplored (6).

Although several studies have examined the association between anemia and delirium, the majority focus on perioperative or postsurgical settings, where acute blood loss is the predominant cause. Reports of elderly patients presenting with delirium primarily due to severe non-haemorrhagic anemia, particularly iron-deficiency anemia, are relatively rare. This highlights an important gap in identifying such reversible contributors in a timely manner is critical in the elderly population, as early intervention can drastically improve clinical outcomes.

Case Report

A 72-year-old homemaker, widow, with no formal education, was brought to the emergency department by her grandson with symptoms of irrelevant talk, occasional agitation, forgetfulness, not able to take her care and not bathing or brushing, disturbed sleep drowsiness, reduced appetite, and intermittent confusion over the past 2 days. Patient noted to be getting up from bed, pulling bedsheet and was not able to recognize family members nor the place she was, telling she is in her village and asking what time of the day it was.

The grandson reported patient is sleeping for 1-2 hours in the night and noted to be drowsy in the day time and she is eating only one or two small meals per day and that to on insistence. He also observed reduced personal hygiene and persistent complaints of burning sensation of stomach, for which she had been self-medicating with over-the-counter medications (tab Pantop 40 mg). Grandson reported patient appeared tensed and looking on to the walls and others without talking.

On examination in Emergency Room her temperature - 37.4°C, heart rate of 92 beats per minute, respiratory rate of 16 breaths per minute, and blood pressure of 98/72 mmHg. There was no evidence of jaundice on the skin or sclera, and no enlargement of superficial lymph nodes or signs of active bleeding were noted. Lung auscultation revealed clear breath sounds with no rales. Cardiac examination showed a regular sinus rhythm. The abdomen was soft and non-tender, with no palpable enlargement of the liver or spleen. The lower limbs showed no edema.

Mental status examination: Patient is conscious, agitated, ill kept, hallucinatory behaviour noted, disorientation to time, place, person, eye contact –made but ill sustained, psychomotor activity – increased, speech tone tempo volume –normal, reaction time increased, denies any delusions, mood subjectively -fine objectively – anxious, no perceptual abnormality

Investigations: Complete blood count: Haemoglobin 7.2 g/dL, Peripheral smear: Microcytic hypochromic anemia, Serum electrolytes, liver and renal function tests, lipid profile, thyroid profile: Normal, Urinalysis: Normal, Chest X-ray: Normal, Malaria antigen, dengue rapid test, typhoid test: Negative, MRI brain: Normal,B12: 315 pg./ml- normal

Treatment and Outcome

Patient was diagnosed as delirium and assessed on Cam -S delirium severity score of 6, started on tab Risperidone 2 mg ½-0- ½ tapered on day 5 to 0- ½ , medicine opinion was taken for haemoglobin 7.2 g/dL and tab albendazole 400mg stat , Oral Iron tablets given in once daily dose, tab vitamin c once daily dose was started, tab paracetamol 650 mg was kept sos for fever, 1unit PRBC was transfused on day 5 and patient haemoglobin improved 7.2 g/dL to 8 g/dl patient Cam -S delirium severity score of 3 ,confusion ,talking to self has reduced and on Day 12 haemoglobin was 8.4 g/dL , Cam -s delirium severity score of 0 and patient was discharged and opd follow-up after 2 week showed haemoglobin 9.0 g/dL.

DISCUSSION

This case illustrates an uncommon but clinically significant etiology of delirium in the elderly severe iron-deficiency anemia. Delirium, characterized by acute disturbance in attention and awareness, is a frequent neuropsychiatric condition among older adults, often arising

from multiple interacting contributors such as infections, electrolyte imbalances, medication effects, or systemic illness. While anemia is commonly discussed in perioperative or chronic disease contexts as a potential contributor to delirium, it is less frequently reported as a sole causative factor in general medical settings, especially in non-surgical elderly patients without overt blood loss or malignancy [1]. In this case, the patient presented with acute-onset confusion, disorientation, and altered behaviour, and had no evidence of infection, intoxication, or metabolic derangement. The most notable abnormality was a profoundly low haemoglobin level, consistent with severe iron-deficiency anemia, suggesting it as the primary precipitating factor for delirium.

The pathophysiology of anemia-induced delirium is believed to revolve around cerebral hypoxia secondary to a reduced oxygen-carrying capacity of blood. The aging brain is particularly vulnerable to even minor disruptions in oxygen supply due to already diminished cerebral autoregulation and preexisting microvascular compromise [8]. Impaired oxygen delivery disrupts cholinergic neurotransmission, a system heavily implicated in maintaining attention and arousal, and thereby predisposes the brain to cognitive disturbances [9]. Hypoxia also triggers a systemic inflammatory response with the release of cytokines such as IL-6 and TNF-α. These cytokines can cross the blood-brain barrier, activate microglia, and contribute to neuroinflammation, which has been consistently linked to delirium pathogenesis [10].

Pandharipande et al. found that moderate to severe anemia suggestive low haemoglobin levels in ICU patients were independently associated with a higher incidence of delirium, irrespective of illness severity or sedation level [11]. Similarly, Wilson et al. observed that anemic patients had greater risk of cognitive impairment and delirium postoperatively, reinforcing the role of compromised oxygen delivery in cognitive outcomes [12]. The observations are consistent with Modesto dos Santos et al., who reported a 90-year-old man with acute gastrointestinal bleeding and hemoglobin as low as 4.8 g/dL presenting with delirium, which resolved following blood transfusion.[13] While these studies mostly involve surgical or critical care populations, they underscore the biologically plausible link between anemia and delirium. Moreover, population-based data from the NHANES III survey show a high prevalence of anemia in community-dwelling older adults, with rates approaching 23.9% in those aged over 85 years, and a substantial proportion of cases remain unexplained [6]. This suggests that clinicians frequently encounter elderly patients with unrecognized or untreated anemia, who may be vulnerable to delirium during acute decompensation.

In our patient, the resolution of delirious symptoms following blood transfusion supports the hypothesis of anemia being the causative factor. Although this is a single-patient observation, it aligns with limited existing literature and emphasizes the importance of including anemia in the differential diagnosis of delirium in older adults. Due to financial limitations, diagnostic endoscopy could not be performed to confirm the exact source of blood loss. However, given the patient's complaint of epigastric discomfort and the absence of other bleeding sources, gastritis was considered the most probable underlying cause of iron-deficiency anemia. Early identification and correction of anemia could potentially reduce morbidity and improve outcomes, particularly when other common causes of delirium are absent.

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