Acta Scientific Women's Health (ISSN: 2582-3205)

Volume 4 Issue 4 April 2022

Case Report

Complete Heart Block Leading to Acute Delirium, A Case Report

Osama Osman*, Connor Clarkston, Julie Gammack, Lina Toledo-Franco, A Hussein, I Atallah, Stephanie Chen and Ali Khan

Department of Internal Medicine/Geriatric Medicine, SLU, USA

***Corresponding Author:** Osama Osman, Department of Internal Medicine/ Geriatric Medicine, SLU, USA.

DOI: 10.31080/ASWH.2022.04.0346

Received: March 17, 2022

Published: March 25, 2022

© All rights are reserved by **Osama Osman., *et al.***

Abstract

Delirium is defined as an acute disorder of attention and cognition. It is common among older patients [1]. Studies have shown that 25-30% of medical inpatients develop delirium; with infections and heart failure the most common reported etiologies [2] while metabolic etiologies account for 80-90% of cases. Delirium occurs in 22–89% of patients with dementia in hospitals and nursing homes [3]. It also increases the cost of hospitalization by ~$ 16,000-64,000 per patient [4]. The causes of delirium are divided into precipitating factors and vulnerability factors [5]. Vulnerability factors include male gender, age ≥ 65 years, educational background, various comorbidities (i.e., dementia, chronic kidney disease, end-stage liver disease, terminal illness), baseline functional status (i.e., immobility, visual impairment, hearing impairment), baseline medication usage (i.e., polypharmacy, psychoactive medication, drug use, and substance withdrawal), malnutrition, dehydration, depression, and circadian rhythm disruption [5]. Precipitating factors include severe illness, infection, sepsis, inadequate pain control, trauma, and hypo- or hyperthermia. Among central nervous system illnesses, examples include intracerebral hemorrhage, cerebrovascular accident, meningitis/encephalitis, nonconvulsive status epilepticus, cerebral edema, tumor, and hydrocephalus. Examples of metabolic disorders that can precipitate delirium include thiamine deficiency, renal failure, liver failure, electrolyte imbalance, hypo- or hyperglycemia, thyroid dysfunction, glucocorticoid therapy hypophysis dysfunction, and porphyria. Cardiorespiratory factors include acute coronary disease, congestive cardiac failure, hypoxemia, hypercarbia, shock, and hypertensive encephalopathy. Mobility restriction is another precipitating factor including the use of physical restraints, bladder catheters, intubation, and assisted ventilation. In addition, other precipitating factors also include malignant hyperthermia, serotonin syndrome, malignant catatonia, paraneoplastic syndrome, >3 medications recently added, anti-NMDA(N-methyl-D-aspartate) encephalitis, and any iatrogenic causes. Infection is the most reported precipitating factor, while dementia is most consistently mentioned among the vulnerability factors [6,7].

However, delirium due to a complete heart block in an elderly patient presents an unusual cause. To our knowledge, only one case reported by Fearon., *et al*. in 1992 of an elderly patient who developed delirium due to complete heart block. Here we present another case of delirium in a ninety-year-old female with complete heart block.

Keywords: Delirium; Geriatric; Old Patient; Heart Block; Electrocardiogram

Case Report

A ninety-year-old female with past medical history of atrial fibrillation, heart failure with preserved ejection fraction (50%) and hypertension on metoprolol presented to the emergency department with progressive dyspnea and chest pain. On presentation, she was found to have pulmonary edema, bilateral pleural effusions, and increasing troponins. On physical exam, she was an obese female with a body mass index of 31.93 kg/

m2 who was acutely distressed. She was afebrile with tachypnea (respiratory rate of 40) and oxygen saturation of 98% on room air. Her blood pressure was 128/56 and heart rate was 52. Her pupils were equal, round, and reactive to light and extraocular movements intact. She had moist mucous membranes. The cardiac exam was benign with normal S1 and S2 and no murmurs, rubs, or gallops. Her neck was supple with no lymphadenopathy and revealed jugular venous distention to the angle of her jaw at 45 degrees. Bibasilar crackles were present. Abdominal exam was unremarkable. She had no clubbing or cyanosis and had 2+ bilateral lower extremity edema. She had no CVA tenderness. On the neurological exam, she was alert and oriented to person, place, and time and was appropriately interactive. She was moving all extremities with no focal neurological deficits.

Her initial labs were notable for WBC 15.3, hemoglobin 14.2, hematocrit 45.3, mean corpuscular volume 100.9, calcium 9.8, phosphorus 3.8, sodium 142, chloride 104, CO2 23, BUN 15, creatinine 0.91, total protein 7.1, albumin 3.8, alkaline phosphatase 62, AST 19, ALT 13, total bilirubin 1.3, PT 28.5, INR 2.7, troponin 0.370 which increased to 2.324. Negative SARS-COV-2 (COVID-19).

Initial management

She was loaded with aspirin 325 mg and Plavix 600 mg and started on a heparin drip for presumed non-ST elevation myocardial infarction. She was given IV diuretics on which her symptoms improved. She was subsequently admitted to Acute Care of the Elderly Unit (ACE) for further management. Her chest pain and shortness of breath improved but she remains delirious. Cardiology service obtained a repeat ECG which shows a complete heart block with junctional escape rhythm of about 50-60 beats per minute (bpm) (Figure 1). She was evaluated for pacemaker implantation. The patient continued to be delirious despite the resolution of her heart failure-as evident on repeat CXR. The patient was transferred to the cardiac intensive care service, where a temporary transvenous pacemaker (TVP) was placed. The patient remained hemodynamically stable but continued to have altered mental status. A leadless pacemaker, Micra TM, device was placed. After placement of the pacemaker and adjustment of the pacing to 70 BPM, the patient had no further episodes of delirium and remains delirium free during her entire hospitalization. The patient was discharged in stable condition on hospital day 12.

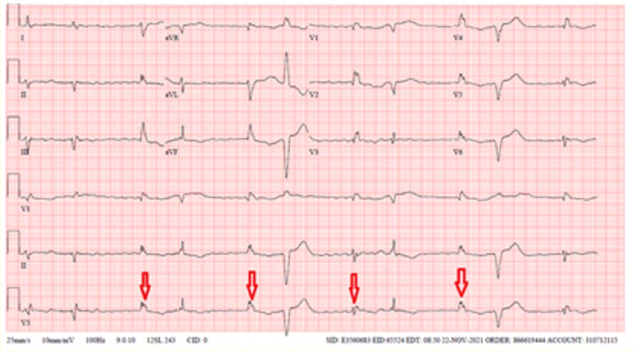

Figure 1: Initial ECG shows complete heart block with an escape rhythm.

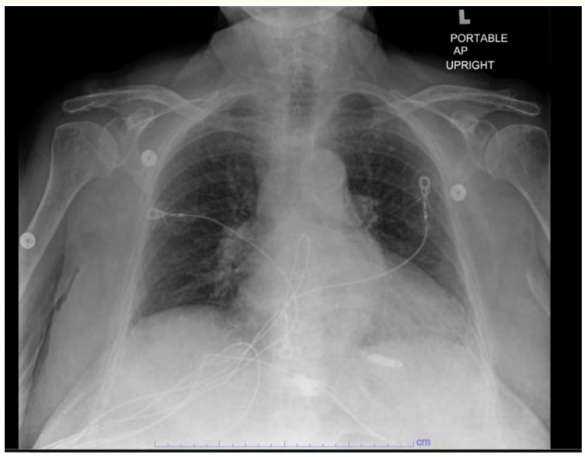

Figure 2: CXR with PM in place.

Discussion and Conclusion

Like that reported by Fearon., *et al*. 1992, our patient developed intermittent delirium due to complete heart block. Both patients (ours and the one reported by Fearon., *et al*.) had a history of atrial fibrillation and hypertension treated with a beta-blockers. However, the patient reported by Fearon., *et al*. presented in an outpatient setting while our patient developed delirium acutely after she was admitted to the hospital. Although the patients presented in different settings, both suffered from delirium in the context of complete heart block. Both patients had no signs of infection, metabolic disorders, thyroid disease, or other common causes which have been associated with acute delirium in elderly patients.

Our patient's heart failure symptoms and chest pain symptoms resolved days before the resolution of her delirium, making heart block the most likely cause of her delirium. Many medications reported to cause acute delirium including anticholinergic drugs, sedative-hypnotics, narcotics [8], and metoprolol [9,10]. Our patient was on metoprolol prior to admission. However, metoprolol was discontinued due to low heart rate. Fearon., *et al*. reported similar circumstances; in their case propranolol and digoxin were discontinued due to low heart rate as well.

In both patients' delirium resolved with pacemaker placement that paced the ventricles at a rate of 70 bpm. In our patient, initial pacing at a lower rate <70 BPM (transvenous and after the insertion of Micra) failed to resolve delirium. Our patient delirium resolved completely when cardiology adjusted Micra rate to 70 BMP. The timing of the resolution of delirium in both patients highly points to the fact that complete heart block is the most likely cause of delirium. As mentioned previously, 25-30% of patients develop intermittent delirium in the hospital setting. A higher portion than originally thought may be due to cardiac causes. In conclusion, providers must consider complete heart block and other cardiac causes as possible precipitating factors for intermittent delirium.

Bibliography

1. Oh ES., *et al*. "Delirium in Older Persons: Advances in Diagnosis and Treatment". *JAMA* 318.12 (2017): 1161-1174.

2. Fearon MP and LaPalio L. "Complete heart block presenting as intermittent delirium: case report and review of the literature on cardiac disease in the elderly". *Journal of the American Geriatrics Society* 40.5 (1992): 507-509.

3. Fick DM., *et al*. "Delirium superimposed on dementia: A systematic review". *Journal of the American Geriatrics Society* 50 (2002): 1723-1732.

4. Leslie DL., *et al*. "One-year health care costs associated with delirium in the elderly population". *Archives of Internal Medicine* 168 (2008): 27-32.

5. Inouye SK. "Delirium in hospitalized older patients: Recognition and risk factors". *Journal of Geriatric Psychiatry and Neurology* 11 (1998): 118-158.

6. Inouye SK., *et al*. "Delirium in elderly people". *Lancet* 383 (2014): 911-922.

7. Elie M., *et al*. "Delirium risk factors in elderly hospitalized patients". *Journal of General Internal Medicine* 13 (1998): 204-212.

8. Cole MG. "Delirium in Elderly Patients". *Focus* 3.2 (2005): 320-332.

9. Fisher AA., *et al*. "Acute delirium induced by metoprolol". *Cardiovascular Drugs Therapy* 16.2 (2002): 161-165.

10. van der Vleuten PA., *et al*. "Delirant beeld, toegeschreven aan het gebruik van metoprolol [Delirium attributed to the use of metoprolol]". *Ned Tijdschr Geneeskd* 149.39 (2005): 2183-2186.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: www.actascientific.com/

Submit Article: www.actascientific.com/submission.php

Email us: editor@actascientific.com

Contact us: +91 9182824667