Unusual Chronotropic Incompetence In A Young Patient - Mitigating The Fear Of Fatal Bradyarrhythmia When Antipsychotics Are Deemed Necessary

Prutha V. Patel, Yash Desai, Minaal Khan, Michael Marney, Dr. Zaid Naseer, Mahmood Sulliman, Dr. Partam Manalai
Mary Washington Healthcare, Fredericksburg, Virginia.

Introduction

Sinus bradycardia, characterized by a slow heart rate, presents challenges in young patients on psychotropic medications, particularly antipsychotics that can cause QT prolongation and arrhythmias. Misinterpreted QT measurements in bradycardia complicate decisions regarding psychiatric treatment, risking either the avoidance of necessary medications or unnecessary cardiac concerns.

This report presents a case of asymptomatic sinus bradycardia in a young male, with heart rates as low as 20–30 bpm and prolonged QT intervals that normalized after adjustment. The case underscores the need for a multidisciplinary approach, including careful QT interpretation, tailored antipsychotic choices, and ongoing cardiac monitoring to safely manage patients with bradycardia on psychiatric medications.

Case Report

A 33-year-old male with bipolar I disorder, substance use disorders, and worsening psychiatric symptoms presented with depression, suicidal ideation, hallucinations, and delusions. His psychiatric symptoms were worsened by social stressors and medication noncompliance. Over the course of hospitalization, he became more cooperative, but urine drug screens consistently showed cannabis use and intermittent cocaine, methamphetamine, and opioid use.

Cardiac findings included profound sinus bradycardia, with resting heart rates in the 20s to 30s, but no symptoms of hemodynamic compromise. ECG revealed a prolonged QT interval that normalized after correction. The patient's management included valproic acid and olanzapine, with close cardiac monitoring due to concerns about QTc prolongation. His psychiatric symptoms improved significantly, and he requested discharge on day 8, with a harm-reduction approach balancing the risks of untreated psychosis and cardiovascular concerns.

Objective Findings

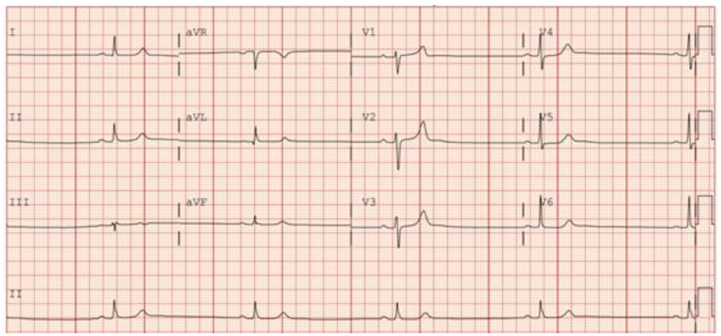

Figure 1. Patient's ECG reading sinus bradycardia at 29 bpm. The ECG reading also indicates a QT interval of 557 ms and a QTcB of 388 ms.

- Corrected QTcB: 436.1 ms (SD = 25.5)
- Corrected QTcF: 451.4 ms (SD = 26.6)
- QT Variability Index (QTVI): 12.9 (suggesting autonomic dysfunction)
- Stress test findings:
  - Peak heart rate: 80 bpm
  - MET: 7.0 (moderate functional capacity)
  - Duke Treadmill Score: 6.0 (low cardiovascular risk

Discussion

This patient's polysubstance use, including cocaine and methamphetamine, likely contributed to bradycardia. Chronic use of these substances can lead to autonomic dysfunction and bradycardia, with studies showing a correlation between cocaine use and sinus bradycardia. Although meth use increases the risk of sudden cardiac death, the patient's UDS results and cardiac measures suggest alternative causes. Despite this, the cardiology team recommended conservative treatment, and the patient was not a candidate for a pacemaker.

For patients with chronic bradycardia, key recommendations include ECG monitoring, avoiding bradycardic or QT-prolonging medications when possible, and educating patients on symptom recognition. Accurate QT interval assessment is critical, with correction formulas like Bazett's helping adjust for heart rate variations. Antipsychotic medications affect cardiac ion channels, with first-generation antipsychotics posing higher QT risks. Second-generation antipsychotics, such as aripiprazole, are safer for patients with cardiac risks, but close monitoring is still required.

Discussion continued

The patient's oral olanzapine treatment was effective without worsening bradycardia or QT prolongation. Managing antipsychotic therapy in bradycardic patients involves baseline evaluations, choosing medications with minimal cardiac effects, working with cardiology, and continuous ECG monitoring. QT-prolonging agents should be avoided for patients with QTc >500 ms.

This case highlights the challenges of treating psychiatric conditions in patients with cardiac comorbidities and underscores the need for personalized, collaborative care. Ethical justification for using antipsychotics relies on balancing the benefits of psychiatric stabilization with potential cardiac risks.

Conclusion

This case emphasizes the challenge of treating psychiatric patients with cardiac issues, especially in resource-limited settings. Despite bradycardia and QTc abnormalities, olanzapine effectively managed the patient's psychosis and mood symptoms. A multidisciplinary approach was key in balancing psychiatric and cardiac risks. The treatment decision was ethically justified, prioritizing stabilization over potential cardiac risks, highlighting the need for continued collaboration between psychiatry and cardiology and further research on the cardiac safety of psychotropic medications.

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References