Remdesivir-associated bradycardia

Patrick R Ching 1, Calvin Lee 2

SUMMARY
Remdesivir is an antiviral used for the treatment of COVID-19 requiring hospitalisation. Information on its cardiovascular safety profile is scarce. We report the case of a 37-year-old man with COVID-19 who developed bradycardia after receiving remdesivir. We recommend a baseline ECG for all patients prior to receiving remdesivir and continuous cardiac monitoring during treatment, especially among those with underlying cardiovascular disease, elderly and using β-blockers.

BACKGROUND
As of June 2021, 178 million cases of COVID-19 have been confirmed, including 3.9 million deaths worldwide. Remdesivir is an antiviral that was approved by the US Federal Drug Administration through emergency use authorisation for use in adult and paediatric patients with severe COVID-19. Not shown to confer mortality benefit, it is given to these patients as it shortens the time to recovery among those who require supplemental oxygen, but not intubated. 1 Despite remdesivir’s wide use, not much is known about its cardiovascular safety profile. We hereby report a case of a patient with COVID-19 who developed bradycardia after receiving remdesivir.

CASE PRESENTATION
A 37-year-old man with hypertension presented with 7-day dyspnoea. He had fever, cough, malaise, anosmia and hypogeusia. Valsartan was his only medication. He did not smoke cigarettes, take alcohol or illicit drugs. He had not recently travelled. On presentation, he was normotensive (blood pressure 118/71 mm Hg), but tachycardic (heart rate 102 beats/min), tachypnoeic (respiratory rate 33 breaths/min) and febrile (temperature 38.2°C). Hypoxic, he required supplemental oxygen via nasal cannula. Lungs were clear to auscultation. Heart rhythm was regular and he did not have any murmur.

Complete blood count was normal. Except for hyponatraemia (sodium 132 mmol/L) and acute kidney injury (creatinine 1.5 mg/dL), the results of the chemistry panel were within normal limits. Chest radiograph showed bilateral patchy lung infiltrates. With a positive SARS-CoV-2 test result, he was diagnosed with severe COVID-19 and was started on dexamethasone and remdesivir. Home valsartan was held because of normotension. Kidney function improved with intravenous fluid. A few hours after receiving the second dose of remdesivir on hospital day 2, he developed asymptomatic sinus bradycardia at 40–44 beats/min (figure 1). Transthoracic echocardiogram was unremarkable. Remdesivir was discontinued and heart rate improved.

Figure 1 Sinus bradycardia after receiving remdesivir.
We recommend a baseline ECG for all patients prior to receiving remdesivir. Our patient’s ECG on admission was sinus rhythm. Cardiac monitoring is essential in remaining vigilant against possible complications of treatment, especially among those with underlying cardiovascular disease, elderly and using β-blockers.

Learning points

- Remdesivir is associated with bradycardia.
- Proposed mechanisms for remdesivir-associated bradycardia include mitochondrial dysfunction and cardiac pacemaker suppression.
- Baseline ECG should be obtained for all patients prior to receiving remdesivir.
- Cardiac monitoring should be done on all patients receiving remdesivir, especially among those with underlying cardiovascular disease, elderly and using β-blockers.

Twitter Patrick R Ching @patrickching

Contributors PRC conceptualised the paper, collected and analysed clinical data, and prepared and revised the manuscript. CL analysed the data, reviewed and revised the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Obtained.

Provenance and peer review Not commissioned; externally peer-reviewed.