Sudden Onset Sick Sinus Syndrome with Dysautonomia

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Introduction

Dysautonomia is an umbrella term for any disorder of the autonomic nervous system involving failure or dysregulation of the sympathetic and parasympathetic systems (1). As in this case, dysautonomia can also be used to define a generalized disorder of the neurological system without specific cause or symptomology. Through prevalence data, dysautonomia most commonly presents as orthostatic hypotension. Although benign, it can have a significant impact on quality of life due to syncope and falls.

Common causes of orthostatic hypotension include medications (most commonly antihypertensives), baroreceptor dysfunction and volume depletion. A new potential cause for dysautonomia that must now be considered is Covid-19 vaccination and SARS-CoV-2 infection.

SARS respiratory viruses have been studied extensively since the pandemic in 2002. A recent study on COVID-19 dysautonomia published in 2021 states that there was a prevalence of dysautonomia in 50% of patients infected with the SARS during the 2002 epidemic (2).

There have also been multiple case reports associating covid-19 infection with worsening dysautonomia. However, there are very few reports of the development of dysautonomia after administration of the covid vaccine (3).

Case Presentation

History of Presenting Illness:

- 64-year-old male with a past medical history significant for paroxysmal afib post-ablation, HTN and hyperlipidemia presented to the ED for severe dizziness and orthostatic hypotension with systolic nadir to 78 mmHg. He denied prior syncopal episodes. On review, 10 days prior to presentation, he had received the Pfizer Covid vaccine and 2 days prior, he was seen at Urgent Care for symptoms of bronchitis. At that time, cardiac exam showed bradycardia with sinus pauses. Due to bradycardia, a dual-chamber Saint Jude pacemaker was placed. Despite a 2L bolus, he continued to exhibit symptomatic orthostasis and was admitted for further work up and care.

Physical Exam:

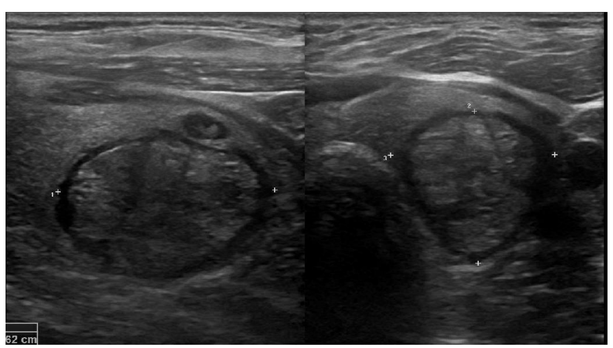
- A&Ox3, Lungs CTAB b/l, Heart RRNMRG, Abdomen soft & non-tender, No lower extremity edema and strength 5/5 bilaterally.

Workup:

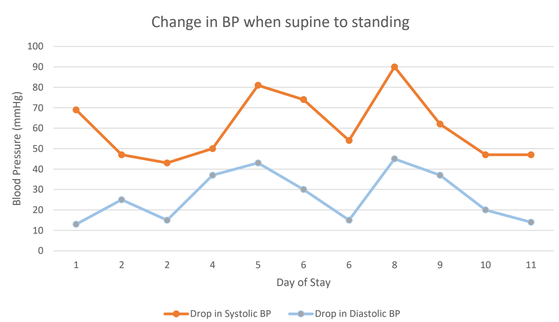
- CBC, BMP, Cardiac enzymes were within normal limits. Chest xray showed stable cardiomegaly without acute process. CTA showed no evidence of pulmonary embolus and a CT brain showed no acute process. Vitals obtained at the time were stable, however, orthostatic blood pressures demonstrated a drop in systolic BP of 45 mmHg (148 to 70) with associated dizziness and lightheadedness. TTE showed HFpEF (55-60%) with no evidence of pericardial effusion and a small left apical thrombus. ECG showed an atrial paced rhythm with a normal heart rate. AM cortisol was found to be normal. TSH and T4 were both normal as well. A CTA/CTV head & neck was obtained that showed no intracranial process but did incidentally reveal a 2.7cm thyroid nodule that occupied much of the left lobe and proximity to the L carotid artery

Hospital Course:

- Through his inpatient stay, he was evaluated by cardiology and neurology. His pacemaker was interrogated and found to be working appropriately but was increased from a baseline rate of 60 to 85 which did not result in improvement in patient's status. Neurology team determined no neurologic etiology. Patient was started on an extensive regimen to improve low blood pressures including holding Metoprolol, and initiating an abdominal binder, compression stockings, Droxidopa 100mg TID, Midodrine 10mg TID, Florinef 0.1mg daily and Pyridostigmine 30 mg TID.
- The patient's symptoms stabilized despite still exhibiting orthostasis with an absolute change of 47 mmHg (systolic) and he was discharged. Outpatient follow up with interventional radiology & ENT ruled out any compressive effect of the thyroid mass and found the mass to be benign.



Left thyroid nodule



Discussion

- Despite being discharged on a significant number of medications, he has continued to have significant drops in BP (up to 20 mmHg) but remains asymptomatic.
- Consideration and discussion was had about performing a partial thyroidectomy to see if there was any improvement in his symptoms.
- There are multiple potential causes or contributing factors in this case.
- This could be a complication of the Pfizer covid-19 vaccine, a post viral dysautonomia or a genetic disorder or pacemaker dysfunction.
- The patient's son did have sudden onset orthostatic hypotension more than 20 years ago which required hospitalization for 2 months before sudden resolution in Japan.

Conclusion

- New onset dysautonomia after COVID-19 vaccination and infection is becoming increasingly common. This case highlights the importance of taking a thorough history regarding COVID-19 vaccination and infection status when faced with a patient with new onset dysautonomia.

References

1. Ninds.nih.gov/disorders/all-disorders/dysautonomia-information-page
2. Goodman B.P., Khoury J.A., Blair J.E., et al (2021). Covid-19 Dysautonomia. Frontiers in Neurology, 12.
3. Reddy, S., Reddy, S., & Arora, M. (2021). A Case of Postural Orthostatic Tachycardia Syndrome Secondary to the Messenger RNA COVID-19 Vaccine.*Cureus*,*13*(5),e14837. https://doi.org/10.7759/cureus.14837