A Constellation of Emergency Department Presentations: BRASH Syndrome

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Introduction

- In 2016, a rare phenomenon know as BRASH (bradycardia, renal failure, AV block, shock, hyperkalemia) syndrome was described.
- This is a synergistic process that can have a variety of presentations. We report an illustrative case of BRASH in an elderly woman who presented to the emergency department (ED) with bradycardia and hypoxia.

Case Description

- An 82-year-old female presented by ambulance to the ED with bradycardia and hypoxia.
- She has a history of atrial fibrillation, chronic renal disease, and congestive heart failure; she was taking both metoprolol and diltiazem.
- The patient was hypothermic, normotensive, bradycardic with heart rates in the 30s, and hypoxic with O_2 saturations in the 60s.
- On physical exam, she was cyanotic in her extremities, lungs clear, mentation at baseline and unchanged throughout exam.
- Initial venous blood gas showed a pH of 7.1, pCO2 of 57, and pO2 of 21.
- Initial potassium was significantly elevated at 7.4. Her renal function was slightly worse than her baseline.
- White count was normal, hemoglobin slightly elevated at 16.4.
- Her point of care glucose returned at 15, and after receiving a D50 amp it improved to 36.
- Her ECG showed a junctional rhythm (Figure 2).

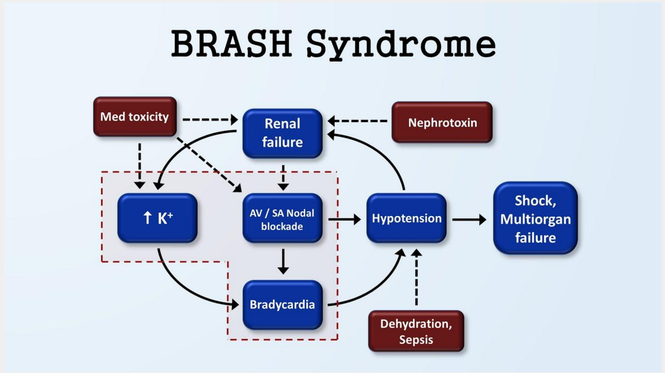

Figure 1: BRASH Syndrome

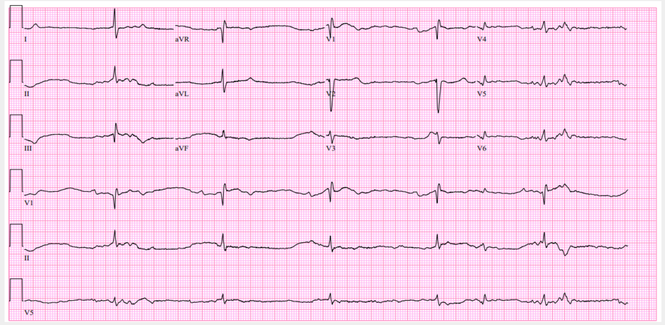

Figure 2: ECG showing a junctional rhythm

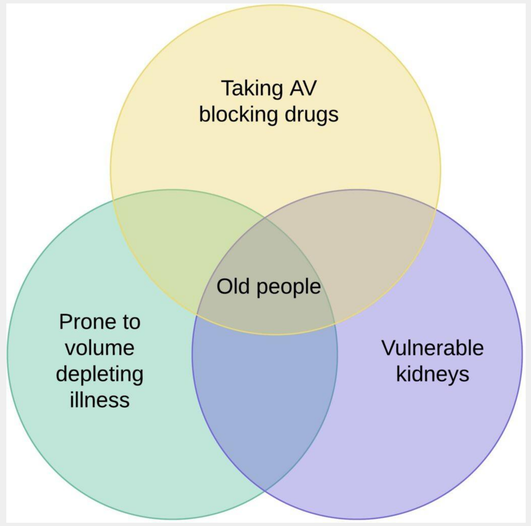

Figure 3: The population with the potential to develop BRASH syndrome is very large

Interventions

- Chest imaging showed bilateral airway disease, for which she was started on ceftriaxone and azithromycin.
- The patient was given 1 mg of atropine and a fluid bolus for hypotension and calcium gluconate for hyperkalemia.
- Hypothermia was addressed by placing patient on a Bair hugger.
- After these initial interventions, a repeat gas was performed. This showed her pH to now be 6.96.
- The patient was intubated and transferred to the MICU.
- The remainder of the patient's hospital course was uncomplicated. Vasoactive medications were able to be weaned, and the patient received diuretics but never required hemodialysis or CRRT.

Conclusions

- A significant number of adult patients presenting to EDs have similar comorbidities and are taking AV nodal blockers, placing them at risk for developing BRASH syndrome (Figure 3).
- Given this, it is imperative that clinicians have a high level of suspicion when patients present with any one component of BRASH syndrome.
- The prognosis for BRASH syndrome depends on the severity of the symptoms and how quickly it is treated.
- With prompt diagnosis and appropriate management, most patients recover fully.

References

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- Shah P, Gozun M, Keitoku K, Kimura N, Yeo J, Czech T, Nishimura Y. Clinical characteristics of BRASH syndrome: Systematic scoping review. Eur J Intern Med. 2022 Sep;103:57-61.