The Heart of the Matter

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INTRODUCTION

Ethylene glycol ingestion is a condition that results in multiple different well-described organ system pathologies. Most notable are renal dysfunction and metabolic acidosis; however, there is a lesser described and just as deadly consequence: non-ischemic cardiomyopathy leading to acute systolic heart failure.

CASE DESCRIPTION

A 29-year-old man presented to the ED after ingesting an unknown amount of ethylene glycol in a suicide attempt. He was initially treated with IV fluid resuscitation, pyridoxine and a 48-hour course of fomepizole. He had a high anion gap metabolic acidosis and acute renal failure for which he was initiated on intermittent hemodialysis. On hospital day six, he became dyspneic and was found to have acute hypoxic respiratory failure in the setting of flash pulmonary edema. He was intubated and transferred to the ICU. An echo was obtained that revealed severe cardiomyopathy with an ejection fraction of 20%, severe global hypokinesis, and a small localized pericardial effusion without tamponade physiology. A beta-blocker was started but the medical team was unable to start an ace inhibitor or spironolactone prior to discharge secondary to acute renal failure. The patient's renal function recovered, and hemodialysis was stopped prior to hospital discharge. He saw cardiology in follow-up, a BMP was performed which showed normalized renal function and he was started on Lisinopril. Additionally, a follow-up echo was performed that showed improvement in his left ventricular ejection fraction (50%), normal right ventricular function, and no pericardial effusion.

Unfortunately, the patient has been lost to follow-up.

RESULTS

Conclusion

- The left ventricular ejection fraction is 20%.
- Severe global hypokinesis noted.
- Normal size left ventricle.
- Normal right ventricular systolic function
- Normal aortic valve structure. •No aortic regurgitation
- Normal mitral valve structure. •Trace mitral regurgitation.
- Normal tricuspid valve structure. •Trace eccentric tricuspid regurgitation
- Normal pulmonic valve structure. •Trace pulmonic regurgitation.
- The IVC diameter is </=21 mm with a <50% collapse with inspiration suggesting a right atrial pressure of 8 mmHg.
- There is a left pleural effusion. •There is a right pleural effusion.
- There is a small localized pericardial effusion anteriorly.
- The findings are not suggestive of tamponade physiology.
- No prior echo

Figure 1: Echocardiogram results

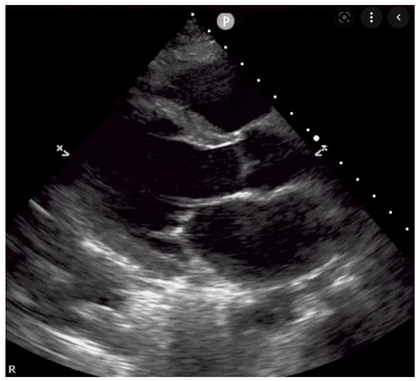

Figure 2: Echocardiogram

DISCUSSION

The pathophysiology of ethylene-glycol induced cardiomyopathy is thought to be secondary to the cardiac toxicity from the profound local cellular effects of the ethylene glycol metabolites. Histopathologic changes in the endomyocardium are consistent with a toxic myocarditis. Additionally, there may be local myocardial toxicity secondary to calcium oxalate crystal deposition, similar to the mechanism for renal toxicity.

CONCLUSION

This case illustrates a less understood consequence of ethylene glycol ingestion. Prompt recognition of this syndrome is critical to avoid the sequela of heart failure exacerbations in these critically ill patients.

Delayed diagnosis of heart failure can lead to clinical decompensation, causing increases in length of hospitalization and utilization of hospital resources. It is especially important to recognize heart failure in this case, as the consequences of concomitant renal failure and heart failure can be devastating.

REFERENCES

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