## B-line Scores on Lung Ultrasound before and after Magnesium Treatment among Patients with Severe Preeclampsia

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#### What we know

- Hypertensive disorders of pregnancy, such as preeclampsia, are the second leading cause of maternal mortality worldwide.<sup>1</sup>
- Pulmonary edema is a serious complication of severe preeclampsia (2.1 – 2.9%).<sup>2, 3</sup>
- IV magnesium sulfate (Mg) is a standard treatment for seizure prophylaxis.
- Some literature suggests Mg administration may be associated with the development of pulmonary edema.<sup>4</sup>
- Lung ultrasound (LUS) is a useful tool for evaluating pulmonary pathology.



A lines



B lines



#### What we don't know

- Does Mg increase pulmonary interstitial fluid?
- Can LUS detect increases in pulmonary fluid after Mg treatment?
- Can LUS help guide fluid and hemodynamic management in this population?

### **Hypothesis**

 LUS can detect increased pulmonary interstitial fluid after a loading dose of Mg.

# Methods

## **Study Design**

- Prospective observational study
- Quaternary teaching hospital
- 8/2024 ullet
- Patients with severe preeclampsia ordered for Mg
  - Bolus: IV MgSO4

(4-6 g over 20 minutes)

- Maintenance: 1-2 g/hour
- LUS scanning •
  - Pre: BEFORE Mg bolus •
  - Post: 1.5-2 hours AFTER Mg ulletbolus

## LUS Data Collection

- 10-second cineloops
- 4 intercostal spaces<sup>1</sup>



**1.3** ICS between **3**<sup>rd</sup> and **4**<sup>th</sup> ribs 2, 4 ICS between 6<sup>th</sup> and 7<sup>th</sup> ribs (Midclavicular line)

### **Secondary Outcomes**

• Secondary Outcomes: Spearman correlation analysis



### **Primary Outcome**

• B-line scores [0-32], Single or confluent B lines<sup>2</sup> • Two blinded observers assessed independently

• Correlation between B-line scores and:

- SpO2 (Post-Mg bolus)
  - MAP (Post-Mg bolus)
  - IV fluid (between Pre- and Post-scan)

### **Statistical Analysis**

Primary Outcome: Wilcoxon signed-rank test

1 Enghard 2015 2 Yagani 2023

# Results

#### Enrolled 15 women (10 pregnant, 5 postpartum)

#### **Primary Outcome** 16 • B-line scores, mean [IQR]): 14 Before Mg: 0 [0-6.5] After Mg: 1 [0-9] (P=0.33) 12 10 • 7 participants (46.7%) with increase in B-line scores 8 Insignificant upward trend **Secondary Outcomes** • No correlation was observed between changes in B-line scores and: • $SpO_2$ (r<sub>s</sub>=0.01, P=0.72) MAP (r<sub>s</sub>=-0.31, P=0.26) •

• IV fluid administered (r<sub>s</sub>=-0.24, P=0.38)





# Discussion/Conclusion



#### What We Found:

Preliminary results suggest an increasing trend in B-line scores after the loading dose lacksquareof Mg treatment.

#### Limitations:

- Due to the small sample size, this increase has not reached statistical significance. •
- Further enrollment is required to test the hypothesis with adequate power. ullet

#### **Clinical Implication:**

- Quick bedside LUS assessment (< 60 seconds) can provide information on respiratory • status in this patient population with elevated risk of pulmonary edema.
- Further studies are warranted to investigate if guiding fluid and hemodynamic • management with this information can improve maternal and perinatal outcomes.



