

# Comparison of Umbilical Cord Blood Gas Parameters in Newborns Born to Mothers with Early and Late-Onset Preeclampsia

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## Introduction

- Preeclampsia is a hypertensive disorder of pregnancy that develops after 20 weeks and can lead to severe maternal and fetal complications (1).
- It is classified into Early-Onset Preeclampsia (<34 weeks) and Late-Onset Preeclampsia (≥34 weeks), with Early-Onset associated with worse outcomes and potentially distinct pathophysiology (2).
- Studies on umbilical cord blood gas parameters, including pH, have shown inconsistent results regarding differences between Early-Onset and Late-Onset(3,4).
- This study aims to assess umbilical cord blood gas values in these preeclampsia subtypes to better understand their impact on fetal outcomes and evaluate whether they support the hypothesis of them having distinct pathophysiologies.

## Methods

### Study Design & Setting:

- Retrospective study at Bezmialem Vakıf University Faculty of Medicine Hospital.

- Includes women diagnosed with preeclampsia before delivery (January 2013 – May 2024).

### Participants:

- 50 women diagnosed with Early-Onset Preeclampsia, 50 women diagnosed with Late-Onset Preeclampsia, total of 100 women.
- Preeclampsia diagnosed using American College of Obstetricians and Gynecologists criteria.
- Early-Onset Preeclampsia: diagnosed before 34 weeks.
- Late-Onset Preeclampsia: diagnosed at or after 34 weeks.
- Gestational age determined by the last menstrual period and first-trimester crown-rump length.

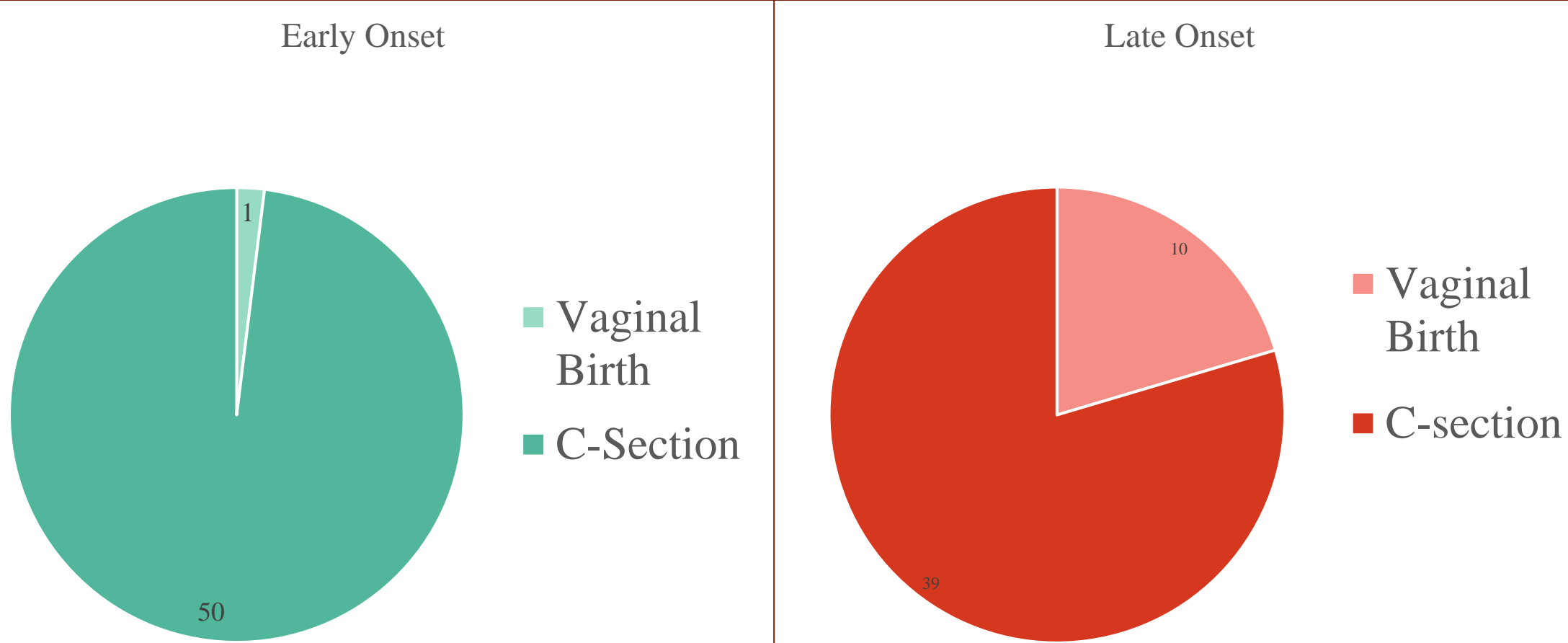
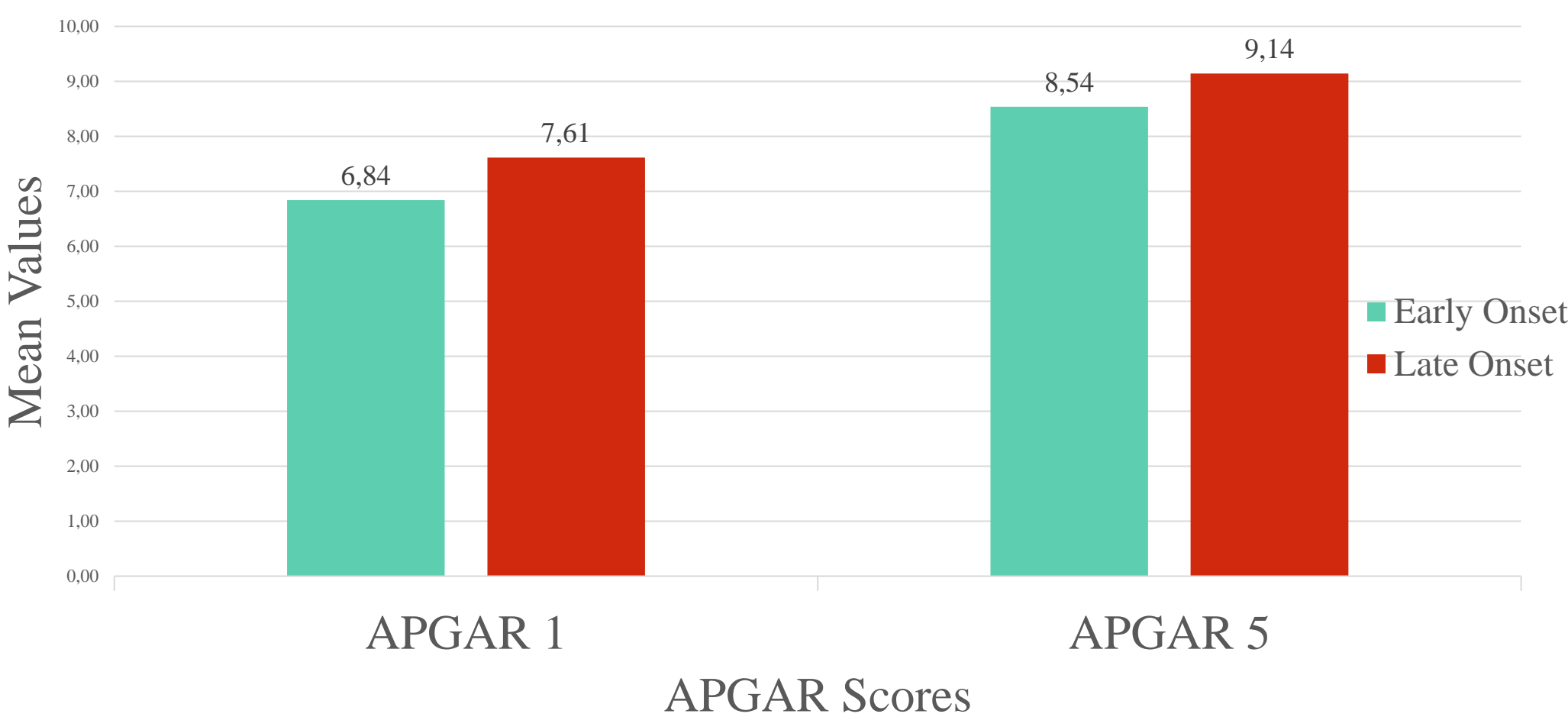
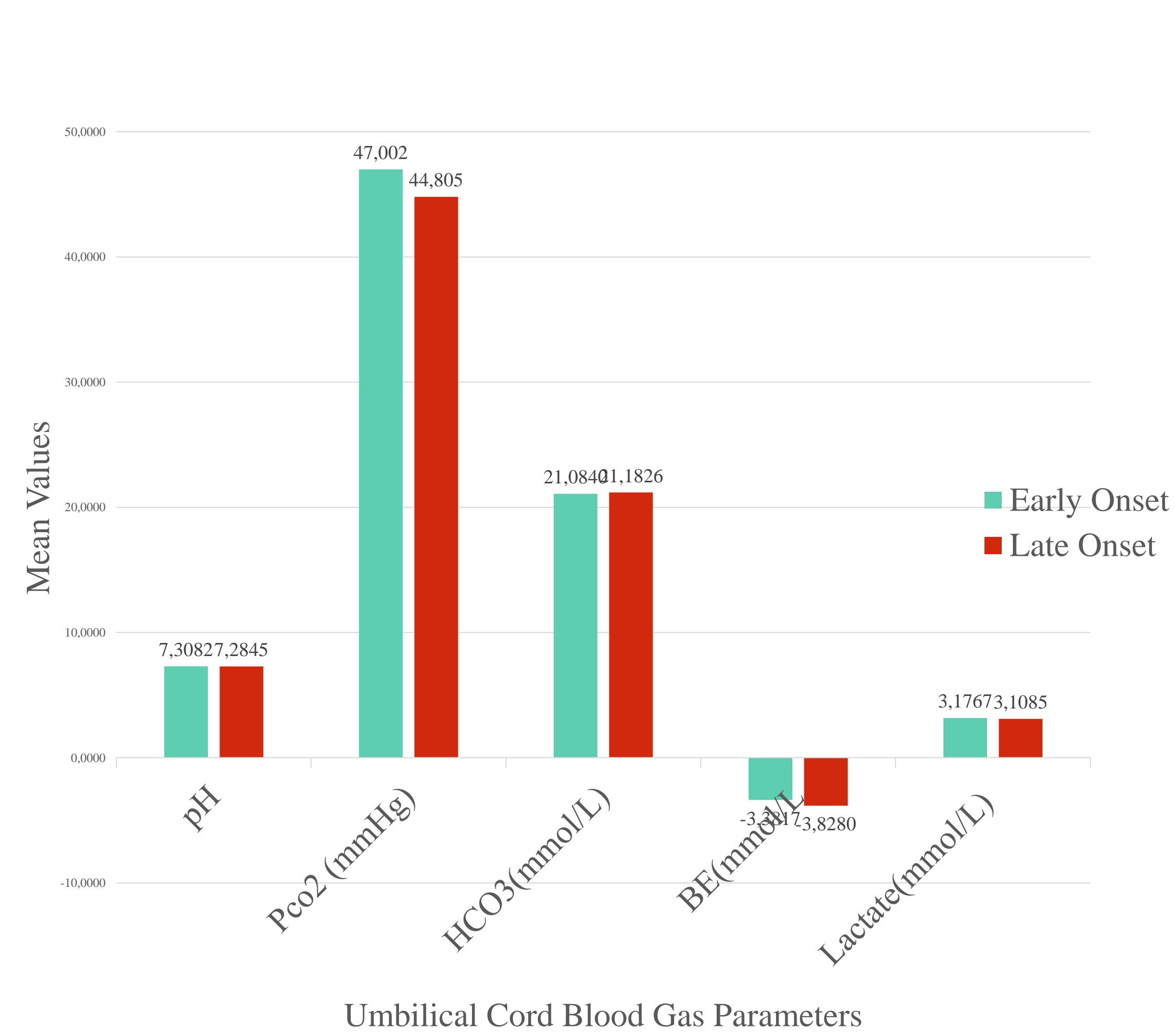
### Outcomes:

- Venous umbilical cord blood gas parameters, including pH, bicarbonate, base excess, partial pressure of carbon dioxide, and lactate.
- Independent Variable: Preeclampsia classification (Early-Onset vs. Late-Onset).
- Dependent Variables: Maternal age, weight, body mass index, preeclampsia onset week, birth week, and delivery method.

### Data Analysis:

- t-tests or Mann-Whitney U tests for continuous variables.
- Chi-square tests for categorical variables.
- Statistical significance set at p<0.05.

## Results



## Conclusion

- Although umbilical blood gas parameters did not significantly differ in our study, including pH, similar to a previous study on the same topic, early-onset preeclampsia was associated with lower APGAR scores.
- Cesarean delivery was highly prevalent among preeclamptic patients, and vaginal delivery was almost never preferred in the early-onset preeclampsia group.

## Limitations

- Small sample size
- One center study
- Patients with Early-Onset preeclampsia diagnosed later may blur group differences.
- The higher preterm birth rate in early-onset preeclampsia cases may independently affect these parameters.

## Implications

- Early-onset preeclampsia leads to worse neonatal outcomes, but no clear differences were found in umbilical cord blood gas parameters.
- Some of the findings still support the hypothesis of distinct disease pathophysiologies.
- Larger, multicenter studies with a greater sample size are needed to confirm these findings.
- Future research should control for gestational age and other confounding factors to better isolate the direct effects of preeclampsia.

## References

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