

Prevalence of postpartum pre-eclampsia in pregnancies affected by COVID-19 Pneumonia

Background

The maternal death rate due to pre-eclampsia ranges from 9-26% in impoverished countries. More so, pre-eclampsia is associated with more than 500,000 fetal deaths across the globe.(1) Pre-eclampsia is defined as hypertension that develops after 20 weeks of gestation associated with other findings including a constellation of laboratory abnormalities and symptoms. Risk factors for developing pre-eclampsia include a history of pre-eclampsia, diabetes, first pregnancy, age of mother greater than 35 years old and elevated BMI above 30.(2) COVID-19 pneumonia is a severe acute respiratory syndrome that ranges from mild to critical disease status.(3) COVID-19 has been associated with pre-eclampsia development during pregnancy with one study noting a 62% odds of pre-eclampsia.(4) However, preeclampsia can also arise in the postpartum period. Re-admission rates for postpartum pre-eclampsia (or other hypertensive disorders) ranges in some studies from 0.4% in uncomplicated pregnancies to as high as 27%.(5,6) This study aims to determine an association between COVID-19 infection in pregnancy and postpartum pre-eclampsia.

Objective

- 1) Determine if there is an association between COVID-19 pneumonia infection during pregnancy and subsequent development of pre-eclampsia in the postpartum setting
- 2) Determine if there was a higher prevalence of postpartum pre-eclampsia during data collection time period

Methods

Various ICD-10 codes were used to identify pregnancies within HCA database between January 2020 and March 30 2022 affected by COVID-19 pneumonia. Out of these selected, 8,792 met inclusion criteria. These pregnancies then further analyzed for secondary factors listed below, specifically analyzing for preeclampsia in the postpartum state.

Exclusion criteria:

Birth of multiples, Patients with eclampsia, pre-eclampsia prior to the postpartum period, unknown race, patients outside of the 18-50 age range, patients with unknown delivery date.

Inclusion criteria:

Singleton pregnancy affected by COVID-19 pneumonia at any point of pregnancy, age 18-50 years old, postpartum status

Secondary factors examined:

Age, race, diabetes, obesity, hypertension

Results

Statistically Significant

Effect	Estimate	95% Confidence Limits	P-Value
Hypertension	2.208	1.318 – 3.700	0.0026
Age	1.053	1.012 - 1.095	0.0099
Race	2.230	1.365 – 3.643	0.0014

Table 1

Not Statistically Significant

Effect	Estimate	95% Confidence Limits	P-Value
Viral Pneumonia	0.671	0.315 – 1.433	0.3031
Diabetes	0.875	0.459 – 1.665	0.6835
Obesity	1.673	0.871 - 3.213	0.1222
C-section vs. Vaginal Delivery	1.141	0.727 - 1.291	0.5651

Table 2

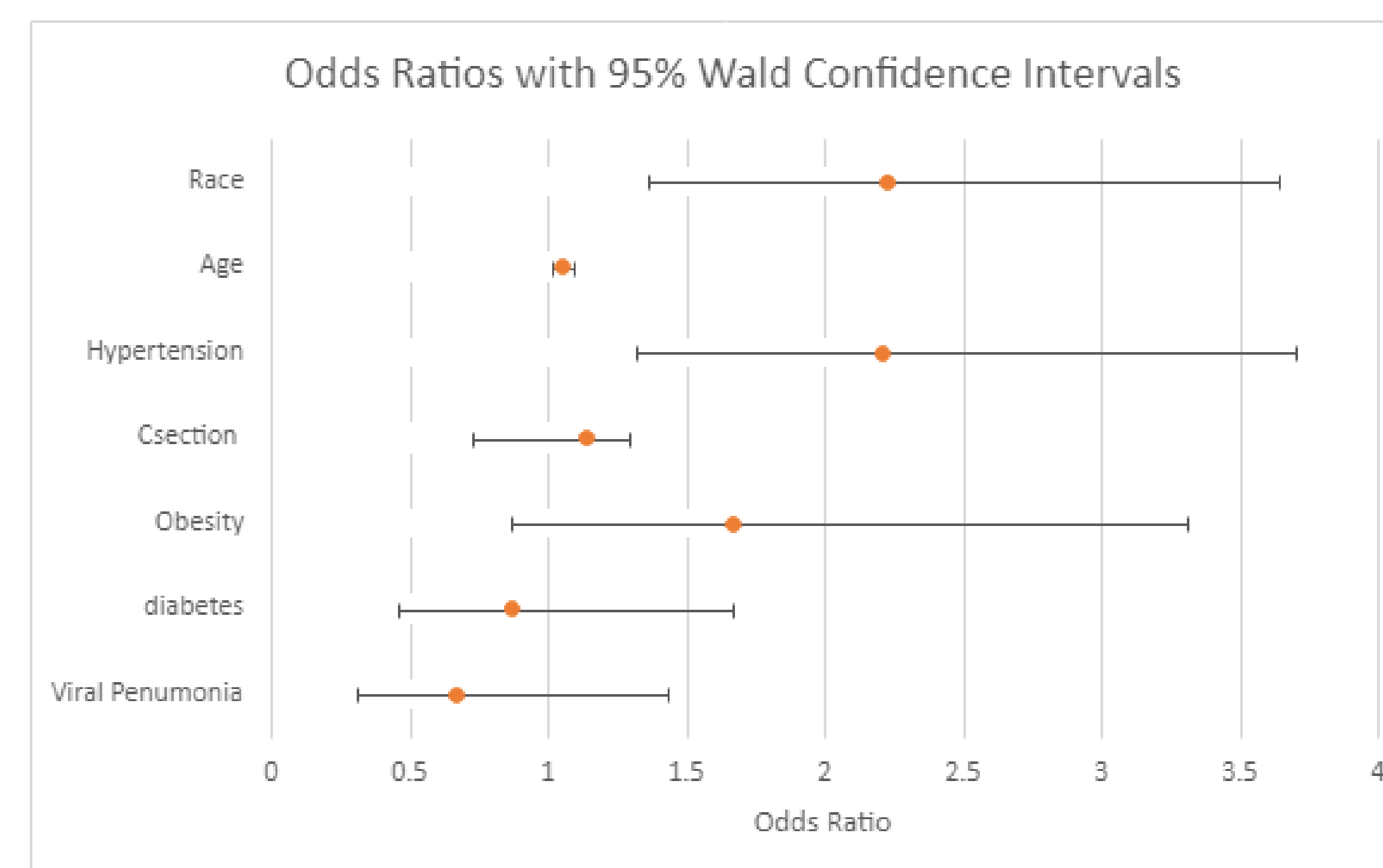


Chart 1

Discussion

- The primary objective COVID-19 pneumonia infection did not confer increased risk of developing post-partum pre-eclampsia.
- Pre-existing hypertension, increased maternal age and black race were associated with increased odds of developing post-partum pre-eclampsia.
- Interestingly, factors identified in literature review to be associated with post-partum pre-eclampsia including obesity and diabetes (7) were not significant of developing post-partum pre-eclampsia in this study.
- Limitations of the study include using coding for data collection, as patients who may fit the inclusion criteria during the study time frame may have been missed if coding was not appropriate. Additionally, using viral pneumonia as a surrogate for COVID-19 infection as patients with COVID-19 without pneumonia may have been missed.

Conclusion

COVID-19 viral pneumonia was not associated with increased odds of developing pre-eclampsia in the post-partum period.

References

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