Economic Burden of Preeclampsia: Maternal and Infant Healthcare Costs

Jing Hao, PhD, MD, MS, MPH, Michael J. Paglia, MD, PhD, Dina Hassen, MPP, Qiang Hao, MS, Jove H. Graham, PhD, MS, Matthew Cooper, PhD, DABT, MBA, Kristina Blessing, MSW, Susan R. Snyder, PhD, MBA

1Geisinger Health System, Danville, PA
2Progenity, Inc. San Diego, CA

Abstract

Objective:

Preeclampsia in pregnancy is a leading cause of prematurity, and maternal and infant morbidity and mortality. Incidence has risen in part from trends in obesity and older age in pregnant women. Evidence of preeclampsia costs is scarce due to data challenges identifying preeclampsia cases and matching mothers and infants. This is the first study using primary data to provide U.S.-case based preeclampsia healthcare cost estimates for mothers and infants from a payer perspective, with comparisons to both normal and hypertensive pregnancies.

Study Design:

Electronic health record and billing data from a large regional integrated healthcare system in Pennsylvania, Geisinger, were used to identify mother-infant singleton infant pairs with deliveries between 2010 and 2015. Data on their clinical care and costs using actual payment amounts were compiled for the following time periods: 20 weeks gestation to 6 weeks post-delivery for mothers and birth to 12 months for infants. Three pregnancy study cohorts (preeclampsia, normal and hypertension) were defined and matched using a 1:1:1 ratio on the basis of maternal age, parity, BMI and comorbidities. Costs per pregnancy were calculated in 2015 dollars and preeclampsia incremental costs were estimated by subtracting the average cost of the matched cohorts.

Results:

Final study population included 712 matched mother-infant pairs in each cohort. Results for preeclampsia cases total incremental costs were $28,603 ($3,374 for mothers and $25,229 for infants) compared to normal and $17,608 ($1,358 for mothers, $16,250 for infants) compared to hypertension (Figure 1). The mean cost per infant was dependent on gestational age, ranging from $214,941 at less than 28 weeks to $20,045 at full term. Mothers with preeclampsia had earlier deliveries with 36.6 median gestational weeks at birth compared to 38.7 for hypertension and 39.5 for normal (p<0.001). A significantly larger percentage of preeclampsia mothers and infants (13.9% for mothers and 14.6% for infants) experienced adverse events compared to normal (4.1% and 0.7%) and hypertension (9.4% and 4.8%) (p<0.001).

Conclusions:

The economic burden of preeclampsia healthcare costs is significant with the main cost drivers being infant healthcare costs associated with lower gestational age and greater adverse outcomes.

Materials

We included mother-infant pairs in three (singleton) pregnancy cohorts: 1) preeclampsia, 2) hypertension, and 3) normal pregnancy. The definition of the preeclampsia cohort is based on ICD-9-10 codes for preeclampsia and eclampsia. The hypertension cohort is defined using chronic, gestational and unspecified hypertension ICD-9-10 codes. The normal cohort includes mother-infant pairs where the infant is born full term (at least 37 weeks and less than 42 weeks) with a birth weight ≥ 2.5 kg, and does not meet any of the Joint Commission Specifications justifying an eleventh delivery. The normal cohort also excludes pregnancies with fetal placental conditions or maternal drug use, or where the infant has congenital malformations based on the California Maternal Quality Care Collaborative diagnosis codes for unexpected complications in term newborns. We also applied other criteria to the three cohort definitions detailed in Table 2.

Table 1: Demographic Characteristics Before and After Matching

Table 2: Maternal and Infant Adverse Events by Cohort

Table 3: Average Gestational Week (GW) at Delivery by Cohort

Conclusion

This is the first study using primary data to provide U.S.-case based preeclampsia healthcare cost estimates for mothers and infants from a payer perspective, with comparisons to both normal and hypertensive pregnancies. The economic burden of preeclampsia is substantial and can be primarily explained by the infant costs associated with prematurity as well as greater adverse outcomes.

References


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