**Supplemental Figure S1. Balance statistics before and after the propensity score matching.**

All the measured covariates were well-balanced in the post-matching model (standardized difference ≤0.065). In the pre-matching model, primary expected payer, hospital setting and teaching status, race/ethnicity, prior cesarean delivery, hospital bed capacity, study period, median household income, hospital region, and obesity exhibited clinical size effect between the two groups (standardized difference >0.20). Abbreviations: PSM, propensity score matching; CD, cesarean delivery; Hp, hospital; HTN, hypertension; DM, diabetes mellitus; muti, multiparity; and PPROM, preterm premature rupture of membrane.

**Supplemental Table S1. Trends of PP-IUD use per patient demographics.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristic | First-  3rd | Mid-  3rd | Last-  3rd | Fold-  increase |
| Age |  |  |  |  |
| <35 | 0.2 | 0.3 | 0.5 | 2.5 |
| ≥35 | 0.1 | 0.3 | 0.5 | 5 |
| Admission type |  |  |  |  |
| Non-elective | 0.2 | 0.3 | 0.6 | 3 |
| Elective | 0.1 | 0.3 | 0.4 | 4 |
| Race/ethnicity |  |  |  |  |
| White | 0.1 | 0.1 | 0.3 | 3 |
| Black | 0.3 | 0.5 | 0.8 | 2.7 |
| Hispanic | 0.3 | 0.5 | 0.9 | 3 |
| Asian | 0.1 | 0.2 | 0.4 | 4 |
| Native American | 0.3 | \*\* | 0.3 | 1.4\* |
| Primary expected payer |  |  |  |  |
| Medicare | 0.4 | 0.4 | 1.9 | 4.8 |
| Medicaid | 0.3 | 0.6 | 0.9 | 3 |
| Private including HMO | 0.1 | 0.1 | 0.2 | 2 |
| Self-pay | 0.1 | 0.2 | 0.3 | 3 |
| No charge | 0 | 0 | 2.5 | -- |
| Median household income |  |  |  |  |
| QT1 (lowest) | 0.3 | 0.5 | 0.9 | 3 |
| QT2 | 0.1 | 0.2 | 0.4 | 4 |
| QT3 | 0.2 | 0.2 | 0.5 | 2.5 |
| QT4 (highest) | 0.1 | 0.1 | 0.3 | 3 |
| Obesity |  |  |  |  |
| None | 0.1 | 0.2 | 0.4 | 4 |
| Class I-II | 0.4 | 0.7 | 1.0 | 2.5 |
| Class III | 0.3 | 0.6 | 0.9 | 3 |
| Diabetes mellitus |  |  |  |  |
| No | 0.1 | 0.3 | 0.4 | 4 |
| Yes | 0.2 | 0.4 | 0.7 | 3.5 |
| Hypertension |  |  |  |  |
| No | 0.1 | 0.3 | 0.5 | 5 |
| Yes | 0.2 | 0.4 | 0.7 | 3.5 |
| Tobacco use |  |  |  |  |
| No | 0.2 | 0.3 | 0.5 | 2.5 |
| Yes | 0.2 | 0.4 | 0.9 | 4.5 |
| Hospital bed capacity |  |  |  |  |
| Small | 0.1 | 0.1 | 0.2 | 2 |
| Medium | 0.1 | 0.2 | 0.3 | 3 |
| Large | 0.2 | 0.4 | 0.8 | 4 |
| Hospital setting teaching |  |  |  |  |
| Rural | <0.1 | <0.1 | 0.1 | 3 |
| Urban non-teaching | 0.1 | 0.1 | 0.2 | 2 |
| Urban teaching | 0.2 | 0.4 | 0.7 | 3.5 |
| Hospital region |  |  |  |  |
| Northeast | 0.3 | 0.6 | 1.0 | 3.3 |
| Midwest | 0.1 | 0.3 | 0.5 | 5 |
| South | 0.1 | 0.2 | 0.4 | 4 |
| West | 0.2 | 0.3 | 0.5 | 2.5 |
| Gestational age at CD |  |  |  |  |
| <28 | 0.3 | 0.2 | 0.5 | 1.7 |
| 28-31.9 | 0.2 | 0.3 | 1.1 | 5.5 |
| 32-33.9 | 0.2 | 0.6 | 0.8 | 4 |
| 34-36.9 | 0.2 | 0.3 | 0.6 | 3 |
| ≥37 | 0.2 | 0.3 | 0.5 | 2.5 |
| Prior CD |  |  |  |  |
| No | 0.1 | 0.2 | 0.3 | 3 |
| Yes | 0.2 | 0.5 | 0.8 | 4 |
| Grand multiparity |  |  |  |  |
| No | 0.2 | 0.3 | 0.5 | 2.5 |
| Yes | 0.6 | 1.4 | \*\* | 1.2 |
| Multiple gestation |  |  |  |  |
| No | 0.2 | 0.3 | 0.5 | 2.5 |
| Yes | 0.1 | 0.3 | 0.7 | 7 |
| Breech presentation |  |  |  |  |
| No | 0.2 | 0.3 | 0.5 | 2.5 |
| Yes | 0.2 | 0.3 | 0.5 | 2.5 |
| Placenta previa |  |  |  |  |
| No | 0.2 | 0.3 | 0.5 | 2.5 |
| Yes | 0.5 | 0.2 | 0.7 | 1.4 |
| PPROM |  |  |  |  |
| No | 0.2 | 0.3 | 0.5 | 2.5 |
| Yes | 0.1 | 0.3 | 0.4 | 4 |
| Uterine myoma |  |  |  |  |
| No | 0.2 | 0.3 | 0.5 | 2.5 |
| Yes | 0.1 | 0.3 | 0.4 | 4 |

Percentage of PP-IUD use is shown (rounded to the one-decimal point). *P*<0.05 for all the measured characteristics except for Native American. \*\*Suppressed per the HCUP instruction (number 1-10). Abbreviations: PP-IUD, postplacental intrauterine device; surgical, permanent surgical sterilization; QT, quartile; CD, cesarean delivery; and PPROM, preterm premature rupture of membrane.

**Supplemental Table S2. Regression-tree model for PP-IUD use at CD.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Node | Time | Race | Payer | Obesity | Hp  size | Hp  teaching | Hp  region | Prior  CD | Node (%) | IUD (%) |
| 48 | Q2-4/2018 |  | Medicare, no charge |  | Large |  |  |  | 0.1% | 4.7% |
| 45 | Q3/2016, Q2/2017, Q4/2017-Q1/2018 | Others | Medicare, no charge |  |  |  |  |  | <0.1% | 3.9% |
| 19 |  | Hispanic | Medicaid |  |  |  | Northeast |  | 1.6% | 2.6% |
| 20 |  | Others | Medicaid |  |  |  | Northeast |  | 0.6% | 2.1% |
| 21 |  | Unknown | Medicaid |  |  |  | Northeast |  | 0.1% | 1.5% |
| 50 | Q4/2015-Q2/2016, Q4/2016, Q3/2017 |  | Medicare, no charge | Class III |  |  |  |  | 0.0% | 1.5% |
| 44 | Q3/2016, Q2/2017, Q4/2017-Q1/2018 | Black, Hispanic | Medicare, no charge |  |  |  |  |  | 0.1% | 1.4% |
| 18 |  | Black, Asian | Medicaid |  |  |  | Northeast |  | 1.8% | 1.1% |
| 23 |  |  | Medicaid |  |  | Urban teaching | Midwest |  | 4.5% | 1.0% |
| 29 |  |  | Medicaid |  |  | Urban teaching | West |  | 5.7% | 0.7% |
| 27 |  |  | Medicaid |  | Large |  | South |  | 8.8% | 0.6% |
| 37 |  |  | Private\* | Class III |  |  |  | Yes | 1.4% | 0.6% |
| 42 |  |  | Self-pay, others |  |  | Urban teaching |  | Yes | 1.5% | 0.5% |
| 38 |  |  | Private\* | Class I-II |  |  |  | Yes | 1.3% | 0.5% |
| 47 | Q2-4/2018 |  | Medicare, no charge |  | Medium |  |  |  | 0.1% | \*\* |
| 51 | Q4/2015-Q2/2016, Q4/2016, Q3/2017 |  | Medicare, no charge | Class I |  |  |  |  | <0.1% | \*\* |
| 17 |  | White, NA | Medicaid |  |  |  | Northeast |  | 2.1% | 0.4% |
| 40 |  |  | Self-pay, others | Class I-III |  | Rural, urban non-teaching |  |  | 0.1% | 0.3% |
| 43 | Q3/2016, Q2/2017, Q4/2017-Q1/2018 | White, Asian, NA | Medicare, no charge |  |  |  |  |  | 0.1% | 0.3% |
| 36 |  |  | Private\* | No |  |  |  | Yes | 18.6% | 0.2% |
| 31 | Q1-2/2018, Q4/2018 |  | Private\* |  |  |  |  | No | 7.2% | 0.2% |
| 26 |  |  | Medicaid |  | Medium |  | South |  | 6.4% | 0.2% |
| 30 |  |  | Medicaid |  |  | Urban non-teaching | West |  | 2.8% | 0.2% |
| 41 |  |  | Self-pay, others |  |  | Urban teaching |  | No | 1.7% | 0.2% |
| 35 | Q1-3/2017 |  | Private\* |  |  |  |  | No | 7.4% | 0.1% |
| 32 | Q4/2017, Q3/2018 |  | Private\* |  |  |  |  | No | 5.0% | 0.1% |
| 25 |  |  | Medicaid |  | Small |  | South |  | 3.0% | 0.1% |
| 22 |  |  | Medicaid |  |  | Rural | Midwest |  | 1.1% | 0.1% |
| 28 |  |  | Medicaid |  |  | Rural | West |  | 0.6% | \*\* |
| 33 | Q4/2015, Q2-3/2016 |  | Private\* |  |  |  |  | No | 7.6% | 0 |
| 34 | Q1/2016, Q4/2016 |  | Private\* |  |  |  |  | No | 4.9% | 0 |
| 39 |  |  | Self-pay, others | No |  | Rural, urban non-teaching |  |  | 1.8% | 0 |
| 24 |  |  | Medicaid |  |  | Urban non-teaching | Midwest |  | 1.3% | 0 |
| 49 | Q4/2015-Q2/2016, Q4/2016, Q3/2017 |  | Medicare, no charge | No |  |  |  |  | 0.3% | 0 |
| 16 | Q1/2017 |  | Medicaid |  |  |  |  |  | 0.1% | 0 |
| 46 | Q2-4/2018 |  | Medicare, no charge |  | Small |  |  |  | <0.1% | 0 |

Regression-tree model was constructed based on the use of PP-IUD. All the independent covariates for PP-IUD use shown in Table 2 were entered in the model. CHAID model was used with the stopping rule of 3 layers. There were 36 terminal nodes identified in the analysis. Frequency of node shown as Node (%) and the utilization rate of PP-IUD shown as IUD (%) are shown in each terminal node. \*\* suppressed per HCUP instruction (number 1-10). \*including unknown. Abbreviations: Hp, hospital; CD, cesarean delivery; IUD, postplacental intrauterine device; Q, quarter-year; NA, Native American.

**Supplemental Table S3. Sensitivity analysis for exposure-outcome relationship.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristics | No IUD | PP-IUD | OR (95%CI) | *P*-value |
| Age |  |  |  |  |
| <35 | 1.5 | 1.9 | 1.30 (0.76-2.22) | 0.342 |
| ≥35 | 1.0 | 1.6 | 1.51 (0.42-5.39) | 0.527 |
| Study period |  |  |  |  |
| First-third | 1.4 | 1.7 | 1.25 (0.33-4.72) | 0.737 |
| Mid-third | 2.0 | 2.2 | 1.09 (0.48-2.50) | 0.833 |
| Last-third | 1.4 | 1.7 | 1.25 (0.65-2.43) | 0.503 |
| Admission type |  |  |  |  |
| Non-elective | 1.4 | 2.6 | 1.82 (0.96-3.44) | 0.065 |
| Elective | 1.4 | 1.0 | 0.71 (0.31-1.61) | 0.414 |
| Race/ethnicity |  |  |  |  |
| White | 1.1 | 0.8 | 0.66 (0.19-2.37) | 0.528 |
| Black | 2.3 | 1.9 | 0.83 (0.36-1.94) | 0.667 |
| Hispanic | 1.3 | 2.5 | 2.03 (0.86-4.77) | 0.106 |
| Asian | 0 | \*\* | -- |  |
| Primary expected payer |  |  |  |  |
| Medicare | 0 | \*\* | -- |  |
| Medicaid | 1.2 | 2.2 | 1.90 (1.05-3.44) | 0.033 |
| Private including HMO | 1.5 | 0.7 | 0.43 (0.11-1.65) | 0.217 |
| Median household income |  |  |  |  |
| QT1-2 | 1.0 | 2.4 | 2.45 (1.72-3.50) | <0.001 |
| QT3-4 | 0.8 | 0.7 | 0.87 (0.36-2.10) | 0.752 |
| Obesity |  |  |  |  |
| No | 1.2 | 1.8 | 1.48 (0.80-2.75) | 0.216 |
| Yes | 1.5 | 2.0 | 1.34 (0.56-3.20) | 0.510 |
| Diabetes mellitus |  |  |  |  |
| No | 1.7 | 1.7 | 1.04 (0.61-1.75) | 0.894 |
| Yes | 1.2 | 2.4 | 2.03 (0.60-6.79) | 0.253 |
| Hypertension |  |  |  |  |
| No | 1.3 | 1.1 | 0.85 (0.44-1.63) | 0.620 |
| Yes | 2.2 | 4 | 1.85 (0.88-3.91) | 0.106 |
| Tobacco use |  |  |  |  |
| No | 1.8 | 1.9 | 1.03 (0.64-1.66) | 0.903 |
| Yes | 0 | \*\* | -- |  |
| Hospital bed capacity |  |  |  |  |
| Small/medium | 1.4 | 1.6 | 1.13 (0.43-2.94) | 0.807 |
| Large | 1.4 | 1.8 | 1.29 (0.73-2.29) | 0.384 |
| Hospital setting teaching |  |  |  |  |
| Rural / Urban non-teaching | \*\* | 0 | -- |  |
| Urban teaching | 1.6 | 2.0 | 1.24 (0.76-2.01) | 0.389 |
| Hospital region |  |  |  |  |
| Northeast | 2.2 | 2.7 | 1.22 (0.60-2.50) | 0.586 |
| Midwest | 2.1 | 1.3 | 0.62 (0.20-1.91) | 0.406 |
| South | 0.9 | 1.5 | 1.61 (0.52-4.95) | 0.407 |
| West | 1.1 | 1.5 | 1.41 (0.44-4.46) | 0.563 |
| Gestational age at CD |  |  |  |  |
| <37 | 1.5 | 3.2 | 2.16 (1.18-3.96) | 0.012 |
| ≥37 | 1.3 | 1.6 | 1.19 (0.67-2.10) | 0.561 |
| Prior CD |  |  |  |  |
| No | 2.3 | 3.6 | 1.55 (0.80-3.00) | 0.191 |
| Yes | 1.1 | 1.0 | 0.93 (0.45-1.94) | 0.852 |
| Grand multiparity |  |  |  |  |
| No | 1.6 | 1.8 | 1.16 (0.72-1.87) | 0.544 |
| Yes | 0 | 0 | -- |  |
| Multiple gestation |  |  |  |  |
| No | 1.6 | 1.9 | 1.16 (0.72-1.89) | 0.538 |
| Yes | 0 | \*\* | -- |  |
| Breech presentation |  |  |  |  |
| No | 1.7 | 1.8 | 1.10 (0.67-1.81) | 0.703 |
| Yes | \*\* | 1.9 | 4.06 (0.45-36.6) | 0.212 |
| Placenta previa |  |  |  |  |
| No | 1.5 | 1.8 | 1.20 (0.74-1.96) | 0.457 |
| Yes | 0 | \*\* | -- |  |
| PPROM |  |  |  |  |
| No | 1.6 | 1.8 | 1.13 (0.70-1.82) | 0.625 |
| Yes | \*\* | \*\* | 1.00 (0.06-16.5) | 0.999 |
| Uterine myoma |  |  |  |  |
| No | 1.6 | 1.8 | 1.16 (0.72-1.89) | 0.538 |
| Yes | 0 | \*\* | n/a |  |

Propensity score matching was performed in each sub-cohort. Generalized estimating equation model was fitted to estimate effect size (PP-IUD *versus* none) for the presence of any measured outcomes (leukocytosis, endometritis, myometritis, or sepsis). \*\*suppressed per the HCUP instruction. Abbreviations: PP-IUD, postplacental intrauterine device; OR, odds ratio; CI, confidence interval; CD, cesarean delivery; and PPROM, preterm premature rupture of membrane.