gestational age at birth, mean birthweight and rate of small for gestational age (SGA). By multivariate regression analysis, composite adverse neonatal outcome was found to be **independently inversely** associated with advanced maternal age (aOR 0.45 95% CI 0.23-0.86). **CONCLUSION:** Advanced maternal age is not associated with adverse neonatal outcome among preterm births and might be a protective factor from early neonatal complications.

**Table 1. Neonatal outcomes according to maternal age**

| | Age≤35 (n=378) | Age>35 (n=116) | p-value |
|---|---|---|---|
| Mean gestational age | 30.5±3 | 30.6±2 | 0.3 |
| Mean birthweight | 1575±563 | 1620±531 | 0.4 |
| Small for gestational age | 146 (38.6) | 51 (44.0) | 0.3 |
| Apgar score at 1 minute | 7.2±2.6 | 7.2±2.5 | 1.0 |
| Apgar score at 5 minutes | 8.8±2.1 | 8.8±2.0 | 0.8 |
| Apgar score< 8 at 5 minutes | 44 (11.6) | 16 (13.8) | 0.5 |
| Steroids up to 1 week prior to birth | 223 (59.0) | 48 (12.7) | 0.6 |
| Steroids 1 to 2 weeks prior to delivery | 48 (12.7) | 17 (14.7) | 0.6 |
| Admission to neonatal intensive care unit | 253 (68.4) | 68 (62.4) | 0.2 |
| Duration of neonatal intensive care unit | 36±31 | 36±27 | 0.9 |
| Respiratory distress syndrome | 113 (30.0) | 27 (23.3) | 0.2 |
| Phototherapy | 204 (54.0) | 60 (51.7) | 0.7 |
| Hypoglycemia | 42 (11.1) | 8 (6.9) | 0.2 |
| Neonatal sepsis | 23 (6.1) | 3 (2.6) | 0.2 |
| Blood transfusion | 44 (11.6) | 11 (9.5) | 0.6 |
| Ventilation | 87 (23.0) | 24 (20.7) | 0.7 |
| Periventricular leukomalacia | 5 (1.3) | 0 (0) | 0.6 |
| **Intraventricular hemorrhage** | **32 (8.8)** | **3 (2.6)** | **0.02** |
| Neonatal seizures | 2 (0.6) | 0 (0) | 1.0 |
| Neonatal death | 6 (1.7) | 1 (0.9) | 1.0 |
| **Composite outcome** | **271 (71.7)** | **72 (62.1)** | **0.05** |

Data are presented as n (%) or mean± SD.

**Table 2: Logistic regression model for composite neonatal outcome between 24.1-34.0 weeks**

| | aOR | 95% C.I | | P |
|---|---|---|---|---|
| | | Lower | Upper | |
| **Maternal age>35** | **0.45** | **0.23** | **0.86** | **0.01** |
| Body Mass Index | 1.01 | 0.95 | 1.07 | 0.73 |
| Steroids up to 1 week prior to delivery | 1.60 | 0.82 | 3.13 | 0.16 |
| Steroids 1 to 2 weeks prior to delivery | 2.27 | 0.83 | 6.20 | 0.11 |
| Pre-gestational diabetes mellitus | 0.69 | 0.15 | 3.06 | 0.63 |
| Gestational diabetes mellitus | 0.61 | 0.21 | 1.72 | 0.35 |
| Gestational age at delivery | 0.88 | 0.73 | 1.06 | 0.19 |
| Birth weight | 0.99 | 0.99 | 1.0 | 0.46 |

OR: odds ratio, C.I: confidence interval

## 709 Shorter maternal leukocyte telomere length following cesarean birth: Implications for future research

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**OBJECTIVE:** Investigators are increasingly studying telomeres given their potential as a transgenerational stress marker and association with longevity. Despite this, little is known about peripartum telomere dynamics. To examine whether leukocyte telomere length (LTL) can be measured reliably postpartum, we evaluated whether LTL is affected by mode of delivery.

**STUDY DESIGN:** Maternal blood samples were obtained up to 6 months postpartum from a prospectively enrolled cohort of 323 pregnant people at one institution. Term, singleton livebirths between 2012 and 2018 were included. Postpartum LTL was measured using quantitative PCR, reported in basepairs (bp), and compared between people with vaginal versus cesarean births. Multivariable linear regression models were conducted sequentially adjusting for age and delivery leukocyte count. These were stratified into two mutually exclusive groups according to timing of postpartum sampling. A subgroup analysis was conducted that included only nulliparas.

**RESULTS:** 72 people met inclusion criteria and had postpartum samples, of whom 52 (72.2%) had a vaginal birth and 20 (27.8%) had a cesarean. Groups did not differ in demographics, leukocyte counts, or blood draw timing (Table 1). The most common indications for cesarean were labor arrest (45%) and elective (35%). LTL was significantly shorter in the cesarean group on postpartum day 1 (PPD1) (5,716.4 versus 6,300.9 bp, p=0.001), as well as beyond PPD1 (5,573.8 versus 5,945.6 bp, p=0.03, Table 2). Differences persisted after adjustments (p=0.004, p=0.04) and after restricting to nulliparas for PPD1 (p=0.01).

**CONCLUSION:** Maternal LTL on PPD1 were nearly 600 bp shorter following cesarean compared to vaginal birth, which is more than 10 times the typical LTL shortening in 1 year. Differences were also evident several weeks postpartum, which was unexpected as post-surgical inflammation is typically resolved by this time. Mode of delivery should be considered in analyses of postpartum LTL, and further characterization of this link and its implications for longevity are warranted.

**Table 1. Demographics and delivery characteristics for study cohort of patients with uncomplicated term, singleton livebirths between 2012 and 2018, N=72.**

| Characteristic | Vaginal birth[a] N = 52 | Cesarean birth[a] N = 20 | P-value[b] |
|---|---|---|---|
| Median (IQR) age at enrollment (years) | 30.0 (3.0) | 30.5 (5.0) | 0.42 |
| Median (IQR) body-mass index (BMI) at enrollment (kg/m$^2$) | 21.5 (4.0) | 23.0 (4.3) | 0.26 |
| Race/Ethnicity[c] | | | |
| Asian | 7 (13.5%) | 4 (20.0%) | 0.36 |
| Hispanic | 13 (25.0%) | 1 (5.0%) | |
| Indian | 15 (28.9%) | 7 (35.0%) | |
| White | 14 (26.9%) | 7 (35.0%) | |
| Multi-race or other | 3 (5.8%) | 1 (5.0%) | |
| Nulliparous | 33 (63.5%) | 14 (70.0%) | 0.78 |
| Gestational diabetes | 8 (15.4%) | 1 (5.0%) | 0.43 |
| Gestational age at delivery (weeks) | | | |
| 37w0d-38w6d | 13 (25.0%) | 6 (30.0%) | 0.15 |
| ≥39w0d | 39 (75.0%) | 14 (70.0%) | |
| Median (IQR) absolute white blood cell count at delivery admission (K/uL) | 11.4 (4.5) | 10.8 (6.9) | 0.80 |
| Median (IQR) absolute leukocyte count at delivery admission (K/uL) | 8.0 (4.2) | 7.9 (6.1) | 0.56 |
| Blood draw timing | | | |
| Postpartum day 1 (Y/N) | 19 (36.5%) | 8 (40.0%) | 0.79 |
| After postpartum day 1 (Y/N) | 33 (63.5%) | 12 (60.0%) | |
| Median (IQR) weeks postpartum if drawn beyond postpartum day 1 | 6.0 (1.0) | 6.0 (1.0) | 0.53 |

[a] Median (interquartile range [IQR]) shown for continuous variables and N (%) shown for categorical variables. Percentages exclude missing data, which included specific missingness for each variable as follows: BMI missing N=4, delivery absolute white blood count missing N=6, delivery absolute leukocyte count missing N=9.
[b] Categorical variables compared using Fisher's exact test, and continuous variables compared using Wilcoxon rank sum tests.
[c] Included given previously reported differences in leukocyte telomere length by race/ethnicity outside of pregnancy.

**Table 2. Association between postpartum maternal leukocyte telomere length (LTL) and mode of delivery, crude and adjusted for maternal age and absolute leukocyte count at delivery.**

| Outcome | Vaginal birth N = 52 Crude mean (95% CI) | Cesarean birth N = 20 Crude mean (95% CI) | Crude beta (p-value) | Beta adjusted for age[a] (p-value) | Beta adjusted for age and leukocyte count[a] (p-value) |
|---|---|---|---|---|---|
| **Whole cohort** | | | | | |
| LTL on postpartum day 1 (bp, N = 27) | 6,300.9 (6,100.9, 6,500.8) | 5,716.4 (5,408.3, 6,024.6) | 584.4 (p=0.002) | 594.3 (p=0.002) | 582.3 (p=0.004) |
| LTL drawn after postpartum day 1 (bp, N = 45) | 5,945.6 (5,772.6, 6,118.7) | 5,573.8 (5,286.9, 5,860.8) | 371.8 (p=0.03) | 432.9 (p=0.008) | 377.3 (p=0.04) |
| **Nulliparous cohort** | | | | | |
| LTL on postpartum day 1 (bp, N = 20) | 6,215.2 (6,015.8, 6,414.6) | 5,693.5 (5,348.1, 6,038.9) | 521.7 (p=0.01) | 524.6 (p=0.01) | -[b] |
| LTL drawn after postpartum day 1 (bp, N = 27) | 5,739.6 (5,571.8, 5,907.4) | 5,494.5 (5,257.3, 5,731.8) | 245.1 (p=0.10) | 250.1 (p=0.10) | -[b] |

[a] Maternal age and delivery absolute leukocyte count were modeled as continuous variables.
[b] Not modeled given not enough degrees of freedom.

## 710 Impact of psychiatric conditions on the risk of severe maternal morbidity in veterans

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**OBJECTIVE:** People with mental health conditions are at increased risk of severe maternal morbidity (SMM), yet little is known about how this differs by psychiatric diagnosis. We evaluated the relationship between psychiatric conditions and SMM in U.S. Veterans - a population with a high prevalence of psychiatric disease and universal screening.

**STUDY DESIGN:** This observational cohort study used diagnosis codes from an administrative database of births to Veterans reimbursed by the Veterans Health Administration between 2010 and 2020. The exposure was a psychiatric condition - defined as depression, anxiety, post-traumatic stress disorder, or severe mental illness (schizophrenia or bipolar disorder) - classified in a mutually exclusive fashion into "active" (codes recorded in clinical encounters within 1 year of delivery) and "historical" (those who only had codes >1 year prior to delivery). The primary outcome was SMM, defined using a validated composite; non-transfusion SMM was also evaluated. A multivariable logistic regression model was conducted adjusting for demographic confounders. Mediation was assessed by separately adding an obstetric comorbidity score (a validated predictor of SMM) and substance use disorders to these models.

**RESULTS:** Of 47,833 eligible births, 3.6% had historical, 17.5% had active, and 79% had no maternal psychiatric conditions (Table 1). Compared to people with no psychiatric conditions, SMM was significantly increased in people with active psychiatric conditions (3.1% active versus 1.8% without, aOR 1.58, 95% CI 1.35-1.84) but not historical psychiatric conditions (1.3% versus 1.8%, aOR 0.89, 95% CI 0.57-1.39, Table 2). Findings were similar for non-transfusion SMM. The risk was increased across all psychiatric diagnoses. After accounting for potential mediators, associations were reduced.

**CONCLUSION:** SMM was significantly increased in Veterans with active psychiatric conditions during pregnancy. Obstetric comorbidities may play a role in the causal pathway and warrant further investigation.

**Table 1.** Characteristics of Veterans with mental health conditions compared to those without mental health conditions, 2010 - 2020 (N=47,833).

| Maternal Characteristic | Births to Veterans without mental health conditions N=37,800 N (%) | Births to Veterans with only historical mental health conditions N=1,728 N (%) | Births to Veterans with only active mental health conditions N=8,355 N (%) |
|---|---|---|---|
| Age at delivery (years) | | | |
| <25 | 2677 (7.08) | 34 (1.97) | 422 (5.05) |
| 25-29 | 12125 (32.08) | 370 (21.41) | 2291 (27.42) |
| 30-34 | 13917 (36.82) | 718 (41.55) | 3132 (37.49) |
| 35-39 | 7273 (19.24) | 470 (27.20) | 2032 (24.32) |
| ≥40 | 1808 (4.78) | 136 (7.87) | 478 (5.72) |
| U.S. District | | | |
| North Atlantic | 6181 (17.54) | 238 (16.09) | 1423 (18.96) |
| Southeast | 6515 (18.49) | 255 (17.24) | 1195 (15.92) |
| Midwest | 8680 (24.63) | 363 (24.54) | 1917 (25.54) |
| Continental | 7486 (21.24) | 357 (24.14) | 1549 (20.63) |
| Pacific | 6382 (18.11) | 266 (17.99) | 1423 (18.96) |
| Race | | | |
| American Indian or Alaska Native | 425 (1.12) | 19 (1.10) | 114 (1.36) |
| Asian | 837 (2.21) | 38 (2.20) | 129 (1.54) |
| Black or African American | 9350 (24.74) | 355 (20.54) | 1962 (23.48) |
| Native Hawaiian or Pacific Islander | 531 (1.40) | 25 (1.45) | 111 (1.33) |
| Unknown | 2984 (7.89) | 131 (7.58) | 621 (7.43) |
| White | 23673 (62.63) | 1160 (67.13) | 5418 (64.85) |
| Ethnicity | | | |
| Hispanic or Latino | 4706 (12.45) | 193 (11.17) | 900 (10.77) |
| Not Hispanic or Latino | 32230 (85.26) | 1509 (87.33) | 7272 (87.04) |
| Unknown | 864 (2.29) | 26 (1.50) | 183 (2.19) |
| Marital status | | | |
| Married | 17162 (45.4) | 714 (41.32) | 3488 (41.75) |
| Single/Never Married | 10871 (28.76) | 452 (26.16) | 2237 (26.77) |
| Widowed/Separated/Divorced | 9077 (24.01) | 543 (31.42) | 2514 (30.09) |
| Unknown | 690 (1.83) | 19 (1.10) | 116 (1.39) |
| BMI at delivery (kg/m$^2$) >40 | 712 (1.88) | 45 (2.60) | 376 (4.50) |
| Pre-pregnancy diabetes (type 1 or 2) | 621 (1.64) | 39 (2.26) | 231 (2.76) |
| Chronic hypertension | 1450 (3.84) | 78 (4.51) | 597 (7.15) |
| Rurality | 4872 (12.98) | 284 (16.47) | 1096 (13.15) |
| Alcohol use disorder | 715 (1.89) | 290 (16.78) | 825 (9.87) |
| Drug use disorder | 535 (1.42) | 195 (11.28) | 748 (8.95) |
| Opioid use disorder | 198 (0.52) | 70 (4.05) | 264 (3.16) |
| Nicotine use disorder | 1246 (3.30) | 337 (19.50) | 1206 (14.43) |
| Insomnia | 322 (0.85) | 104 (6.02) | 246 (2.94) |