

Arrival Physiology and Pre-Hospital Racial Disparities in Pregnant Trauma: A National Analysis



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- Black women experience maternal mortality rates two to three times higher than White women.
- Trauma is a leading cause of non-obstetric maternal death, yet racial disparities in pregnant trauma outcomes remain poorly understood.
- Racial disparities in maternal trauma are often attributed to differences in mechanism of injury

Goal: Our group aims to investigate the effect of mechanism of injury in maternal trauma, and explore other leading causes of morbidity

Methods

• Study Design & Population

- Retrospective cohort study using the National Trauma Data Bank (2019–2021)
- Pregnant patients with at least moderate traumatic injury (ISS > 9)
- Pregnancy identified via NTDB labeling
- **967 total patients:** 606 White, 361 Black

• Statistical Analysis

- **1:1 propensity score matching**, 317 total matched pairs on: Age, ISS, AIS score (Head, face, neck, etc...), MOI (transport, fall, intentional/penetrating, GSW)
- **Primary outcome:** in-hospital mortality
- **Outcome Mode:** Sequential Logistic Regressions

Characteristic	Before matching			After matching		
	White (n=606)	Black (n=361)	SMD	White (n=317)	Black (n=317)	SMD
Demographics						
Age, years	27.4 (7.8)	26.1 (6.4)	+0.18	26.4 (6.3)	26.2 (6.4)	+0.03
Injury severity						
ISS	19.7 (11.0)	20.4 (13.1)	-0.06	20.2 (11.9)	20.3 (12.7)	-0.01
Head AIS	1.3 (1.8)	1.0 (1.6)	+0.18	1.1 (1.6)	1.1 (1.6)	-0.01
Thorax AIS	1.5 (1.6)	1.3 (1.6)	+0.08	1.3 (1.5)	1.4 (1.6)	-0.03
Abdomen AIS	1.5 (1.8)	1.5 (1.8)	-0.02	1.6 (1.8)	1.5 (1.8)	+0.04
Spine AIS	0.7 (1.2)	0.7 (1.3)	+0.04	0.7 (1.1)	0.6 (1.1)	+0.01
Lower extremity AIS	1.6 (1.5)	1.5 (1.6)	+0.05	1.6 (1.6)	1.6 (1.5)	+0.01
Mechanism of injury						
Transport	474 (78.2%)	229 (63.4%)	+0.33	233 (73.5%)	229 (72.2%)	+0.03
Fall/Mechanical	48 (7.9%)	14 (3.9%)	+0.17	9 (2.8%)	14 (4.4%)	-0.08
Penetrating/Intentional	52 (8.6%)	89 (24.7%)	-0.44	50 (15.8%)	48 (15.1%)	+0.02
Other	32 (5.3%)	28 (7.8%)	-0.10	25 (7.9%)	26 (8.2%)	-0.01

Results

a Sequential logistic regressions

OR (95% CI) / p

Race only

1.95 (1.20–3.15)

p = 0.007

+ In-hospital care factors
(transfusion, time to hem. control,
angiography, ICU, vent days)

1.83 (1.08–3.08)

p = 0.024

+ Pre-hospital structural
(helicopter, transport time,
cardiac arrest)

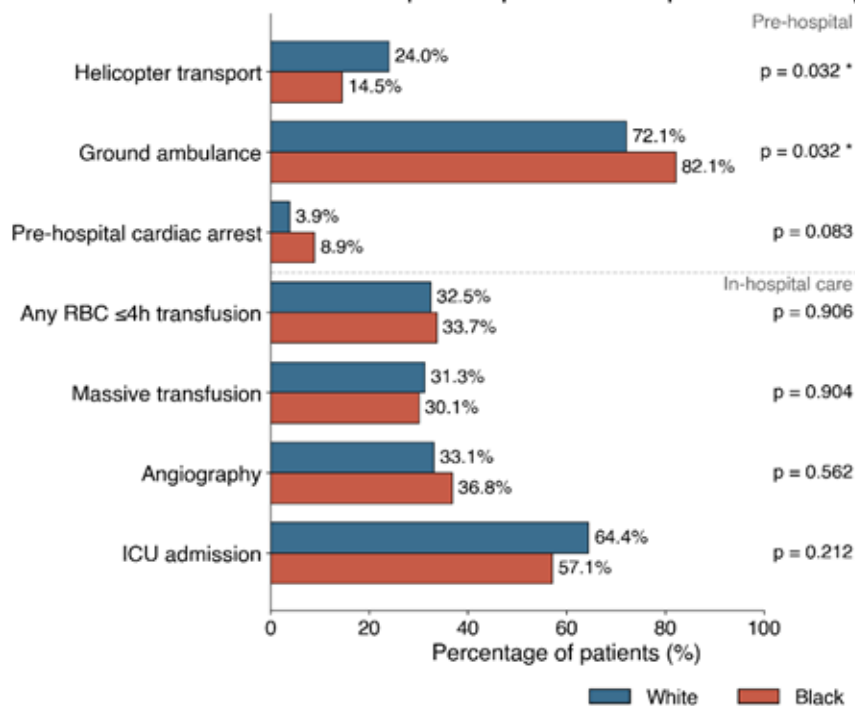
1.08 (0.62–1.88)

p = 0.790

0.5 1.0 1.5 2.0 2.5 3.0 3.5

Odds ratio for in-hospital mortality (Black vs White)

b Pre-hospital disparities vs. equivalent in-hospital care



Discussion

- Among pregnant trauma patients matched on injury anatomy and mechanism, Black patients received helicopter transport less often (14.5% vs 24.0%) and arrived in pre-hospital cardiac arrest more often (8.9% vs 3.9%) than White patients.
- Once we accounted for how patients reached the trauma bay, the mortality gap disappeared
- In-hospital care appeared similar between groups. The disparity was already established by the time these women arrived.
- For pregnant trauma patients, the most dangerous part of the journey may be the one before the hospital.
- Reducing maternal trauma mortality will require attention to EMS access, helicopter coverage, and timely recognition of injury severity in pregnant women at the scene.