



Using electronic medical record data to quantify racial and ethnic differences in pain management following cesarean birth

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ABSTRACT

Objective: Racial disparities in pain management have been documented in health care settings. We sought to evaluate associations between patient race and ethnicity and pain management following cesarean birth.

Study Design: We conducted a retrospective cohort study of mothers following cesarean birth at North Carolina Women's Hospital between 7/1/2014 and 6/30/2016. Maternal pain scores (0-10) and medication administration were documented in Epic Electronic Medical Record (EMR) as part of routine clinical care. We used these data to determine frequency of pain assessment, pain scores, and administration of opiate analgesia from 0 to 48 hours postpartum (PP). Opiates administered were converted to 5 mg oxycodone tablet equivalents (OTE). We excluded from our sample women who received general anesthesia, were in the intensive care unit after delivery, were currently treated with methadone or buprenorphine, or received ≥ 2 opiate prescriptions during antenatal care. We used chi square tests to compare prevalence of severe pain, indexed by pain scores > 7 , and linear regression models to compare OTE administered by maternal race/ethnicity, adjusting for insurance status, primary language, age, and primiparity. P values < 0.05 were considered statistically significant.

Results: 1,970 women underwent cesarean section during the study period, of whom 1,776 met inclusion criteria. EMR records included 32,361 pain assessments and 13,989 opiate doses administered from 0-48 hours after c-section. The number of pain assessments differed by race-ethnicity, with the highest number of assessments for non-Hispanic white women (Table, $p < .001$). Mean pain scores were highest for non-Hispanic black women (Figure), and these women were most likely to have at least one pain assessment $> 7/10$, whereas Asian women were the least likely (chi square $p < .001$). Although non-Hispanic black women reported higher pain scores, they received less opiate analgesia than non-Hispanic white women (OTE mean, [se] 0-24h PP: 7.0 [0.3] vs. 8.1 [0.3]; 24-48h PP: 7.8 [0.5] vs. 8.7 [0.5], $p < .001$), as did Asian, Hispanic and other women, adjusting for insurance, language, age, and primiparity.

Conclusion: We found racial differences in pain scores and administration of opiates. EMR data can be leveraged to identify differences in care delivery that may contribute to health disparities.

BACKGROUND

In multiple healthcare settings, black patients are less likely to receive pain medication for a given diagnosis than white patients.

OBJECTIVE

Among women who had undergone cesarean birth, we sought to quantify the extent to which postpartum pain assessment, pain scores and opiate medication administration varied by patient race and ethnicity

METHODS

- We conducted a retrospective cohort study of mothers who underwent cesarean section of ≥ 1 liveborn infant at North Carolina Women's Hospital between July 1, 2014 and June 30, 2016.
- We excluded women who:
 - Underwent general anesthesia
 - Were admitted to the intensive care unit
 - Received ≥ 2 opiate prescriptions during prenatal care
 - Were receiving opiate replacement therapy
- Birth data were ascertained from the UNC Perinatal Database. Patient race/ethnicity, maternal pain scores and opiates administered were retrieved from the Carolina Data Warehouse for Health, which houses data from the Epic@UNC electronic medical record.
- Opiate pain medications administered were converted to oxycodone tablet equivalents (OTE) for analyses to allow comparability of doses between patients.
- Severe pain was quantified as ≥ 1 pain score > 7 in a 24 hour period.
- Mean pain scores by race/ethnicity were plotted by time since delivery.
- We used chi square tests to compare frequency of severe pain, and we used linear regression to compare OTE administered, adjusting for language, age, insurance and parity.

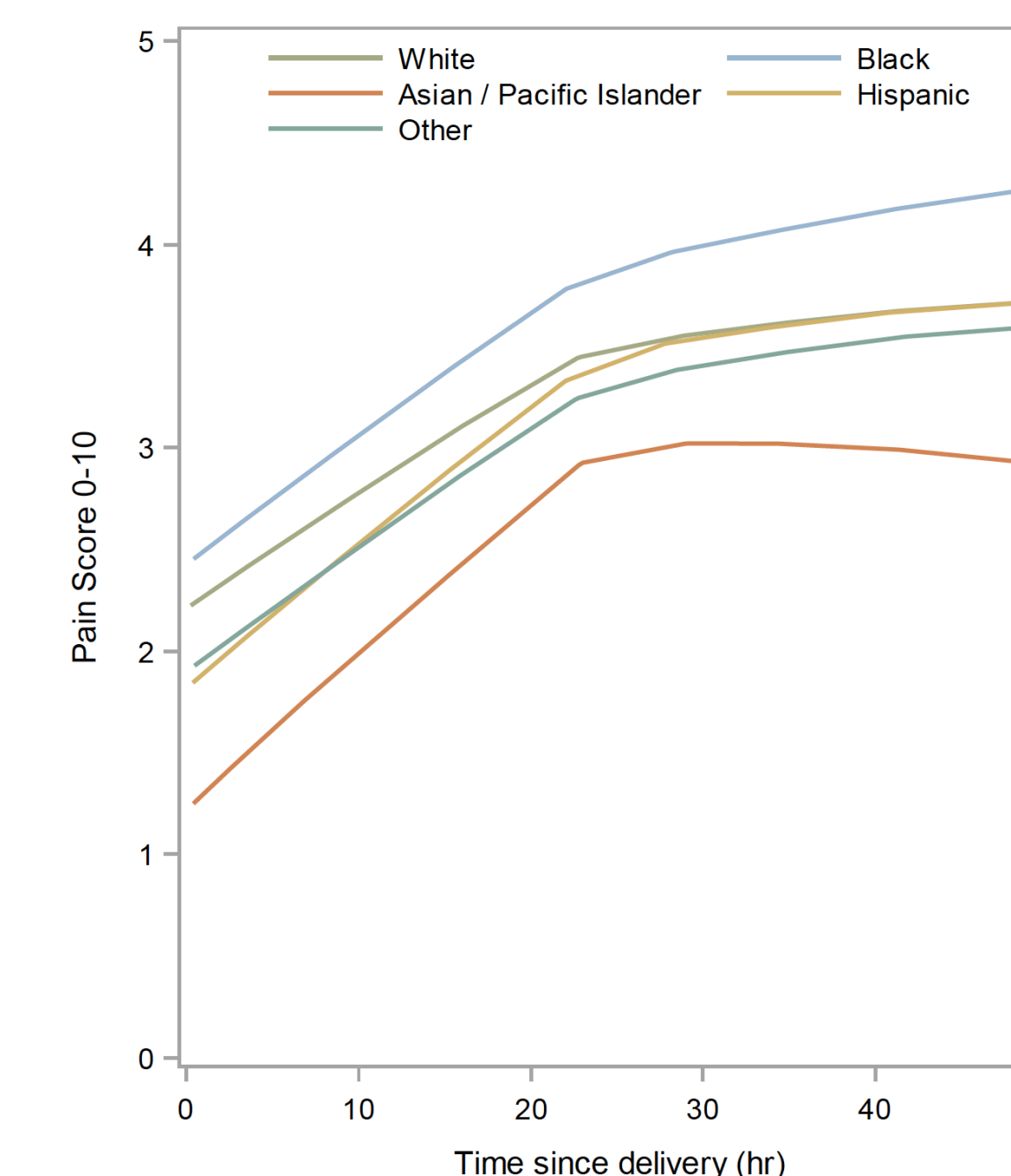
RESULTS

1,776 met inclusion criteria for our analysis. We analyzed 32,361 pain assessments and 13,989 opiate doses documented in the first 48 hours following cesarean birth.

Study Population

	Non-Hispanic White (NHW)	Non-Hispanic Black (NHB)	Asian	Hispanic	Other	p
N	732	440	86	375	138	
Maternal Age, %						$< .001$
<20	1.1	3.6	1.2	2.9	0.7	
20-24	11.8	20.2	2.3	13.3	16.7	
25-29	20.9	29.3	17.4	22.1	25.4	
30-34	34.8	24.3	31.4	29.9	24.6	
≥ 35	31.4	22.5	47.7	31.7	32.6	
Insurance, %						$< .001$
Private	63.7	37.5	81.4	15.2	44.9	
Public	29.4	58.6	17.4	80.8	44.2	
Military	6.2	3.0	0.0	1.1	7.3	
Self or Unknown	0.8	0.9	1.2	2.9	3.6	
Primary language, %						$< .001$
English	98.8	98.6	65.1	32.3	81.9	
Primiparous, %	42.4	38.6	50.0	22.9	40.6	$< .001$
Pregravid BMI, %						$< .001$
Underweight	2.3	1.6	7.0	0.5	0.7	
Normal	36.1	16.8	58.1	19.5	35.5	
Overweight	22.8	20.9	20.9	24.8	21.7	
Obese	26.0	47.5	7.0	32.3	24.6	
Infant in NICU, %	27.6	30.7	7.0	18.1	33.3	$< .001$

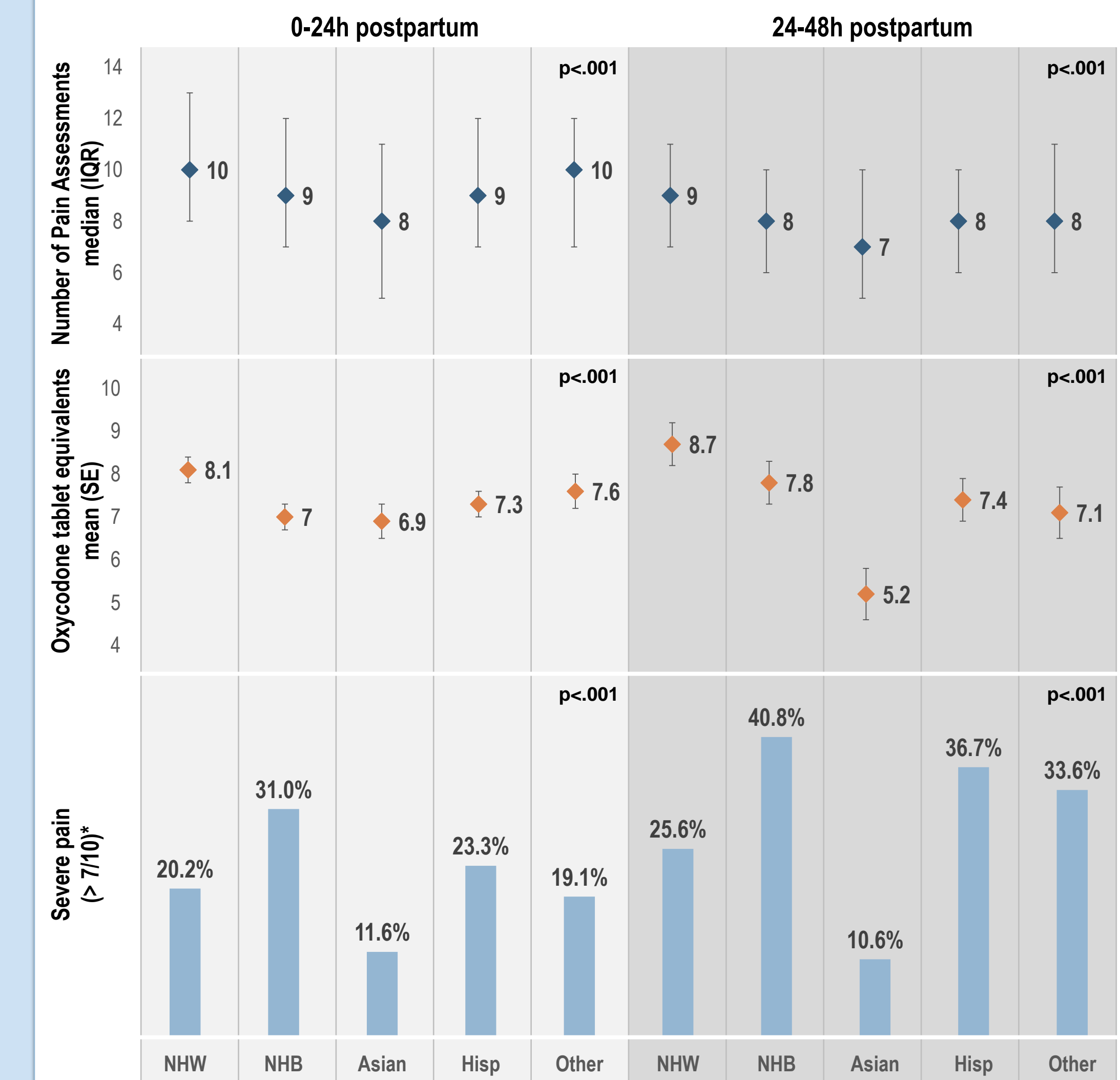
Mean pain score after c-section



NHB women had the highest mean postpartum pain scores and Asian women had the lowest pain scores.

Compared with white women, assessment of pain was documented less frequently for NHB, Hispanic and Asian women, and they received lower doses of opiate-containing pain medication during the postpartum hospitalization. While Asian women had the lowest frequency of severe pain, NHB had the highest frequency of severe pain.

RESULTS



*OTEs adjusted for language, age, insurance and parity

CONCLUSIONS

- We found racial/ethnic disparities in assessment, treatment, and levels of post-operative pain among postpartum women.
- EMR data can be leveraged to identify and correct differences in care delivery that may contribute to health disparities. Such investigation is critical for facilitating equitable healthcare.

FUNDING

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