

INTRODUCTION

- Cesarean Delivery (CD) is one of the most common surgical procedures performed in the world
- Neuraxial anesthesia (NA) is preferred over general anesthesia (GA) for CD due to its association with better maternal and fetal outcomes (1)
- NA can fail to provide adequate surgical anesthesia. NA failure is defined as the presence of intraoperative pain reported by patients.
- Studies have demonstrated breakthrough pain medications being administered in CD at rates of 11.5% to 15.1% (2)
- Conversion rate to GA from NA is approximately 6% globally, but variable (3)
- Pain during CD is associated with long-term maternal complications like postpartum depression and post-traumatic stress disorder (4)

OBJECTIVE

The purpose of this study is to conduct a retrospective chart review of all patients who had a cesarean delivery at NSUH to quantify the rate of NA failure. We used the administration of supplemental medications during CD as a surrogate for NA failure.

METHODS

- Retrospective cohort study
- Patient population includes all patients who had a CD in 2023 at North Shore University Hospital (NSUH).
- Frequency Analysis and descriptive statistics
- Primary Outcomes:
 - Number of patients who received NA and required supplemental medication
- Secondary Outcomes:
 - Type of supplemental medication (Fentanyl, Midazolam, Dexmedetomidine, Ketamine) and frequency
 - Patient demographics (age, BMI, race, ethnicity, comorbidities)
 - GA conversion from NA

RESULTS

Figure 1. Frequency of Number of Supplemental Medication Given to Patients

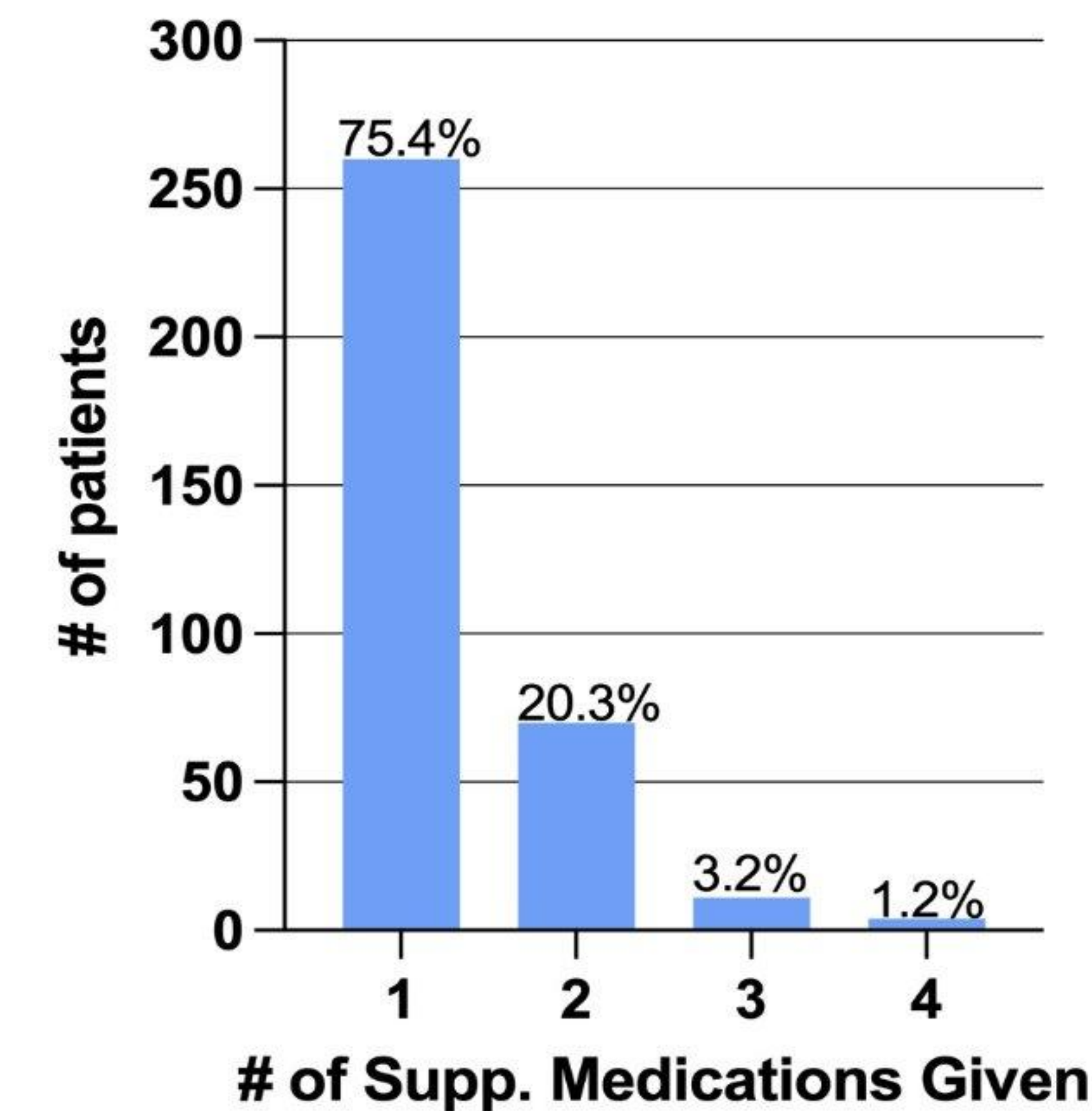
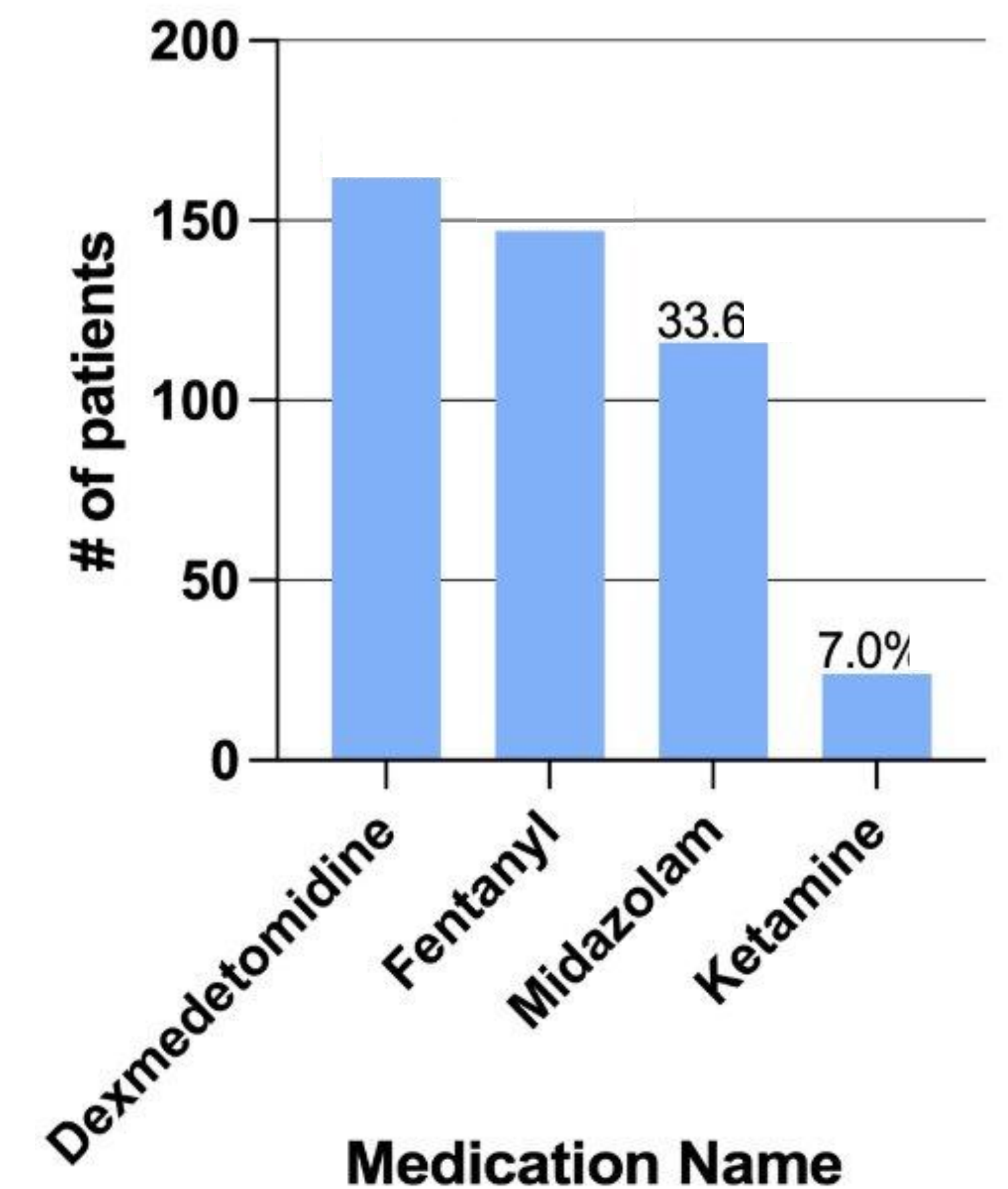
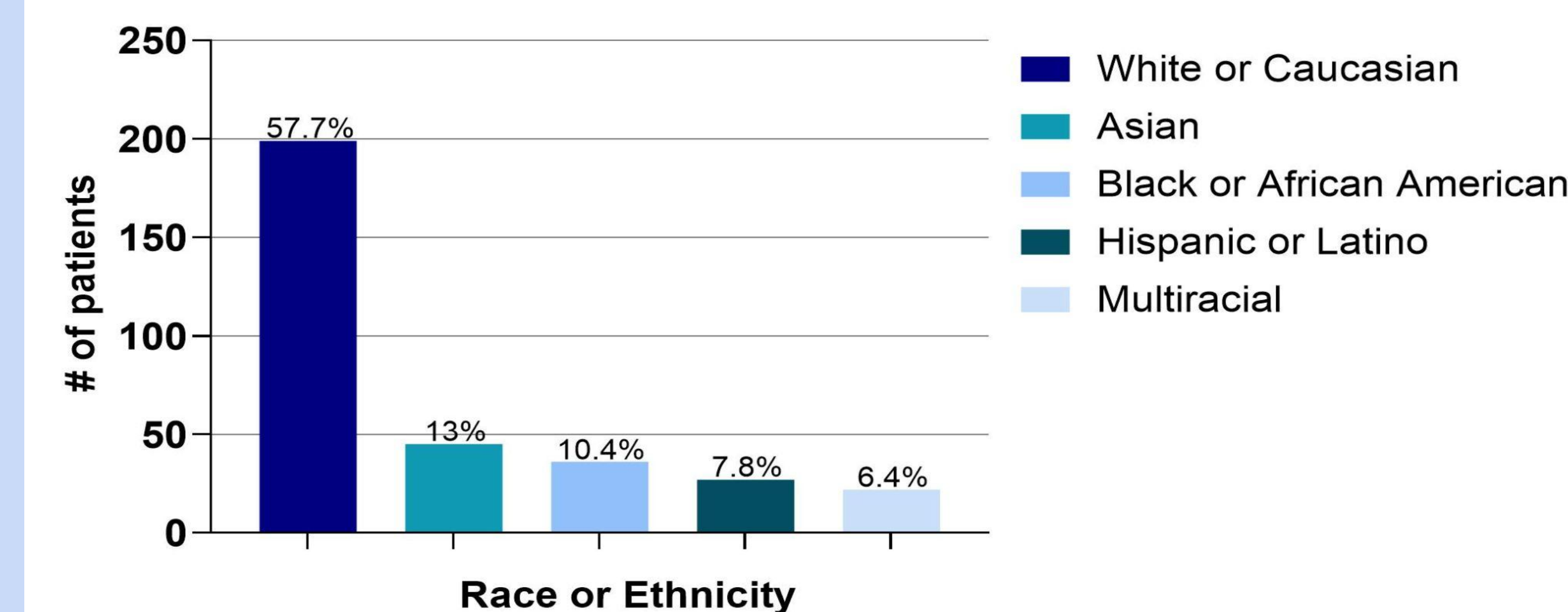


Figure 2. Frequency of Type of Supplemental Medication Given



- 2091 CDs were performed at NSUH, 345 patients were included in our study
 - There was a **16.5% NA failure rate**
 - 51.9%** these patients received an epidural
- 0.87%** of patients who received supplemental medication converted to GA
- 75.4% of patients received 1 supplemental medication, 20.3% received 2 medications, 3.2% received 3, and 1.2% received 4 (Fig. 1)
- Frequency of administration by type of medication: Dexmedetomidine (administered to 46% of patients), Fentanyl (42%), Midazolam (34%), and Ketamine (7%) (Fig. 2)
- 57.7% of NA failure patients were White or Caucasian, 13% were Asian, 10.4% were Black or African American, 7.8% were Hispanic or Latino, and 6.4% were Multiracial (Fig. 3)

Figure 3. Racial Breakdown of Patients who received Supplemental Medication



DISCUSSION

- As pain during CD is associated with mood disorders like PTSD, this study evaluating NA failure and possible demographic factors is crucial to improving maternal outcomes.
- There are limitations to using breakthrough pain medication as a surrogate for NA failure; it is possible not all patients who receive breakthrough medications experience pain, and not all patients in pain receive medication
- Given that a higher proportion of Caucasian patients received supplemental medication, future studies can examine causes for this disparity, including racial bias, overmedication, and underrecognition of pain in minority populations.
- We plan to further study the factors that increase risk for NA failure and identify the patient populations most at risk for intraoperative c-section pain.

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Table 1. Descriptive Statistics of Supplemental Medication Types

	Midazolam	Fentanyl	Dexmedetomidine	Ketamine
Mean Dose (mg or mcg)	1.95±0.63	72.04±38.12	12.83±7.58	36.67±30.68
Most frequent dose (mg or mcg)	2	100	8	20
Dose Range [Min, Max]	3 [1, 4]	280 [20, 300]	67.42 [4, 71.42]	80 [20, 100]