Association between guideline-compliant prophylaxis and the incidence of post-operative nausea and vomiting in patients undergoing Cesarean delivery: a multicenter retrospective cohort study

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Background

- Cesarean delivery (CD) accounts for >30% of live births in 2023
- PONV can occur in 30-80% of this population
- The MPOG PONV-01 metric (updated 2022 to PONV-05)
  - Success: ≥ 2 two antiemetic agents of different classes preoperatively or intraoperatively
- The MPOG PONV-03 metric
  - Success: No rescue antiemetics and/or documented PONV from PACU start up to 6 hours after anesthesia end

Aim

- Association between passing PONV-05 and PONV-03

Hypothesis

- Guideline compliance associated with improved PONV

MPOG
MULTICENTER PERIOPERATIVE OUTCOMES GROUP

Duke

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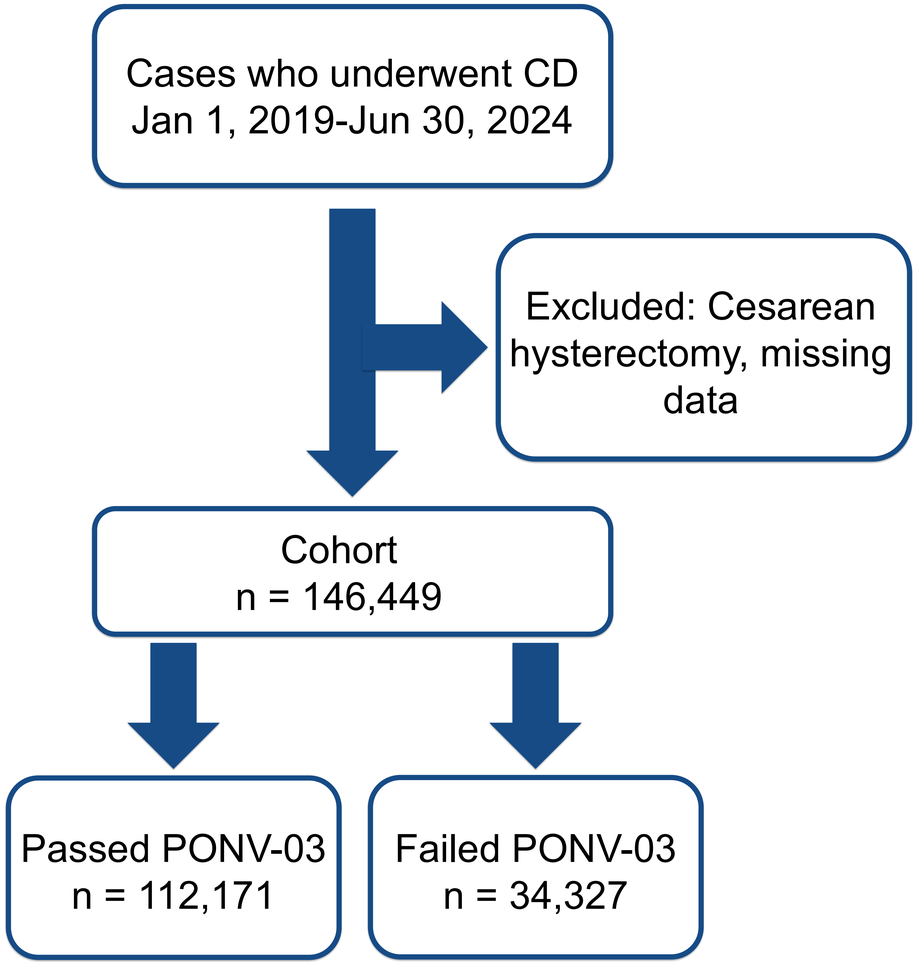
STUDY DESIGN AND METHODS



- Retrospective cohort study using MPOG database
- Exclusion criteria: Cesarean hysterectomies, missing PONV-05 metric, missing PONV-03 metric
- Cases stratified by pass/fail of PONV-03 metric
- Descriptive statistics
- Standardized mean differences (SMDs)
- An unadjusted logistic mixed-effects model
  - Outcome PONV-03
  - Primary predictor PONV-05
  - Clustering by institution.

RESULTS

	Overall	Failed PONV-03	Passed PONV-03	SMD
Total number	146449	34278	112171	
Age, years	31.30 (5.67)	31.19 (5.68)	31.33 (5.67)	0.025
BMI, kg/m2	34.23 (7.64)	34.74 (7.70)	34.07 (7.61)	0.088
Surgery Duration, min	59.34 (41.95)	58.57 (43.63)	59.59 (41.40)	0.024
Year				
2019	22344 (15.3)	4757 (13.9)	17587 (15.7)	0.060
2020	23247 (15.9)	5770 (16.8)	17477 (15.6)	
2021	24542 (16.8)	5706 (16.6)	18836 (16.8)	
2022	24963 (17.0)	5739 (16.7)	19224 (17.1)	
2023	24995 (17.1)	5997 (17.5)	18998 (16.9)	
2024	26358 (18.0)	6309 (18.4)	20049 (17.9)	
Total risk factors				
2	99 (0.1)	25 (0.1)	74 (0.1)	0.083
3	5806 (4.0)	1318 (3.8)	4488 (4.0)	
4	118283 (80.8)	26937 (78.6)	91346 (81.4)	
5	21500 (14.7)	5773 (16.8)	15727 (14.0)	
6+	761 (0.5)	225 (0.6)	536 (0.5)	
PONV risk factors				
Age <50	146339 (99.9)	34250 (99.9)	112089 (99.9)	0.003
Female sex	146426 (100.0)	34274 (100.0)	112152 (100.0)	0.004
History of PONV	4207 (2.9)	1540 (4.5)	2667 (2.4)	0.116
Inhalational anesthetic use >1hr	2594 (1.8)	479 (1.4)	2115 (1.9)	0.038
Opioid use	143673 (98.1)	33680 (98.3)	109993 (98.1)	0.015
Non-smoker	141951 (96.9)	33203 (96.9)	108748 (96.9)	0.005
Total number of antiemetics given				
0	4968 (3.4)	1264 (3.7)	3704 (3.3)	0.088
1	35809 (24.5)	8400 (24.5)	27409 (24.4)	
2	69880 (47.7)	16930 (49.4)	52950 (47.2)	
3	30159 (20.6)	6729 (19.6)	23430 (20.9)	
4+	5663 (3.8)	955 (2.8)	4678 (4.1)	
Antiemetics given, total				
5-HT3 Receptor Antagonists	137502 (93.9)	32161 (93.8)	105341 (93.9)	0.004
Anticholinergics	508 (0.3)	99 (0.3)	409 (0.4)	0.013
Antidopaminergics	51948 (35.5)	10482 (30.6)	41466 (37.0)	0.135
Antihistamines	16013 (10.9)	3338 (9.7)	12675 (11.3)	0.051
Glucocorticoids	75244 (51.4)	19149 (55.9)	56095 (50.0)	0.118
Neurokinin-1 Receptor Agonists	62 (0.0)	17 (0.0)	45 (0.0)	0.004
Phenothiazines	3958 (2.7)	534 (1.6)	3424 (3.1)	0.100
Other	3520 (2.4)	516 (1.5)	3004 (2.7)	0.082
PONV-05 (prophylaxis compliance) passed	105673 (72.2)	24614 (71.8)	81059 (72.3)	0.010

Table 1: Descriptive statistics of cohort, divided by PONV-03 pass/fail. Data are mean (SD) or n (%)

Predictors	OR	CI	p-value
(Intercept)	0.27	0.21-0.35	2.62E-26
PONV-05 result Failed	1.10	1.06-1.14	9.27E-09

Figure 1: Unadjusted model

Predictors	OR	CI	p-value
(Intercept)	0.24	0.18-0.30	2.2E-31
PONV-05 result Failed	1.12	1.08-1.16	1.06E-11
year2020	1.23	1.17-1.29	6.76E-18
year2021	1.14	1.09-1.20	1.92E-08
year2022	1.13	1.08-1.19	3.13E-07
year2023	1.20	1.14-1.25	5.96E-14
year2024	1.19	1.14-1.25	6.67E-14

Figure 2: Model adjusted by year

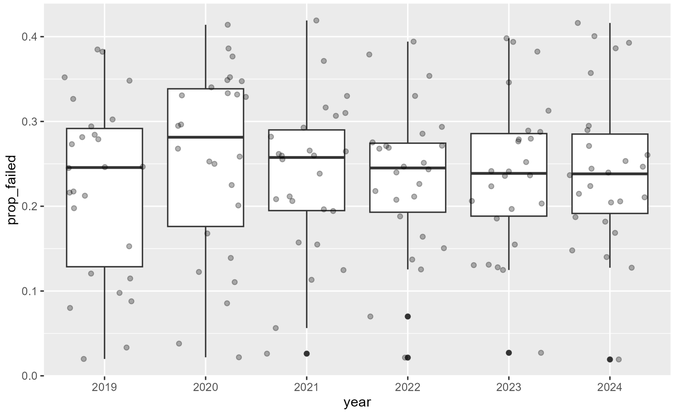


Figure 3: PONV-03 fail rate by year across all institutions

CONCLUSIONS

- In this cohort, 23% of cases failed PONV-03
- Passing the PONV-05 metric is associated with passing the PONV-03 metric
  - Compliant prophylaxis is associated with lower incidence of PONV
- Further multivariable modeling is in progress to fully illustrate the association between prophylaxis guideline compliance and the incidence of PONV