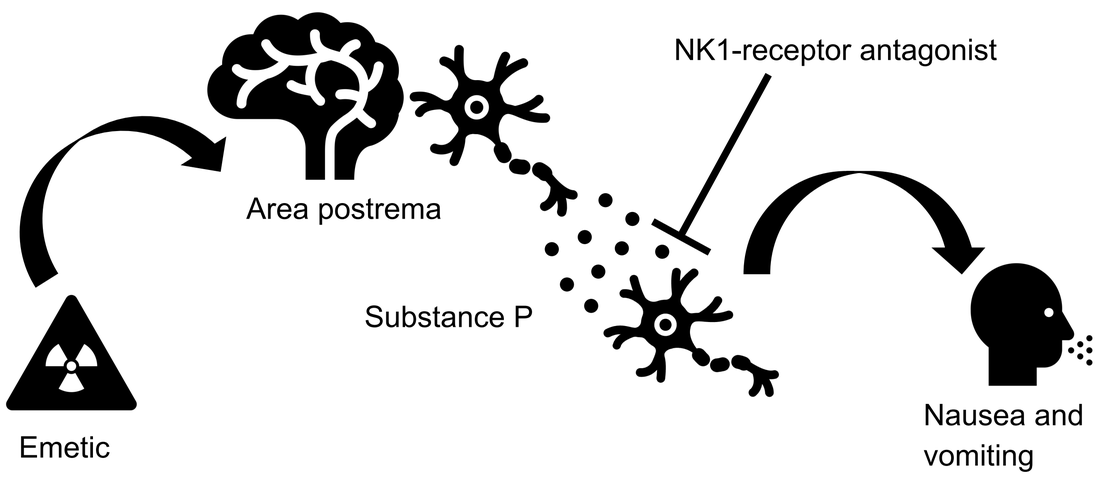
Effect of Pre-operative Aprepitant Administration on Post-operative Nausea and Vomiting in Anterior Skull Base Surgery

Authors: Anuj U. Patel, MD, MS[1]; Cynthia Sun, BS[2]; Hewitt Chang, BS[2]; Jared Clouse, MD[3]; Kiarash Shahlaie, MD, PhD[3]; E. Bradley Strong, MD[1]; Toby Steele, MD[1]

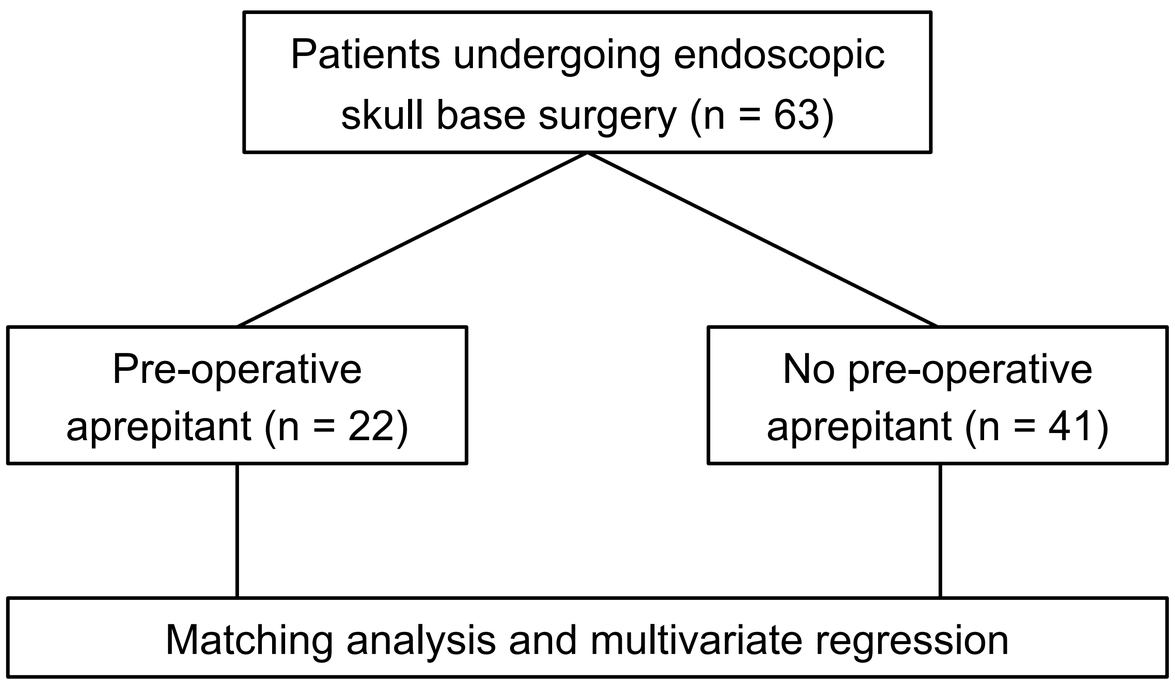
[1]Department of Otolaryngology – Head and Neck Surgery; [2]School of Medicine; [3]Department of Neurological Surgery, University of California, Davis, Sacramento, CA

Introduction

- Post-operative nausea and vomiting (PONV) occurs in up to 80% of patients following sinonasal surgery[1]
- Targeted anti-emetic therapy may reduce risk of PONV thereby reducing risk of Valsalva-associated forces and subsequent bleeding or CSF leak in patients undergoing ESS[2]
- Aprepitant is a selective antagonist of the neurokinin-1 receptor (NK-1R) that blocks substance P[3,4]
- **Hypothesis:** pre-operative aprepitant will reduce the % of PONV in patients undergoing endoscopic skull base surgery (ESBS)



Methods



- Primary outcome – % of patients with PONV events
  - Matched analysis for age, sex, smoking status, and history of PONV
  - Multivariate logistic regression adjusting for age, sex, TIVA use, PONV history, smoking status, ASA score, procedural time, and intraoperative CSF leak
- Secondary outcome – post-operative bleeding event

Results

Characteristic	Aprepitant, n (%)	Control, n (%)	Overall, n (%)
Number of patients	22	41	63
Age (years), mean [SD]	56.2 [17.8]	55.2 [17.2]	55.5 [17.4]
Sex Female Male	 8 (36.4) 14 (63.6)	 18 (43.9) 23 (56.1)	 26 (41.3) 37 (58.7)
TIVA use	6 (27.3)	16 (39.0)	22 (34.9)
PONV history	2 (9.1)	1 (2.4)	3 (4.8)
Smoking status	3 (13.6)	3 (7.3)	6 (9.5)
ASA score, mean [SD]	2.73 [0.54]	2.88 [0.45]	2.83 [0.49]
Procedure time (min), mean [SD]	232.6 [97.6]	248.6 [114.7]	243.0 [109.3]
Intra-op CSF leak	7 (31.8)	15 (36.6)	22 (34.9)

Table 1. Patient demographics. Abbreviations: SD, standard deviation; TIVA, total intravenous anesthesia; ASA, American Society of Anesthesiology; CSF cerebrospinal fluid

Results

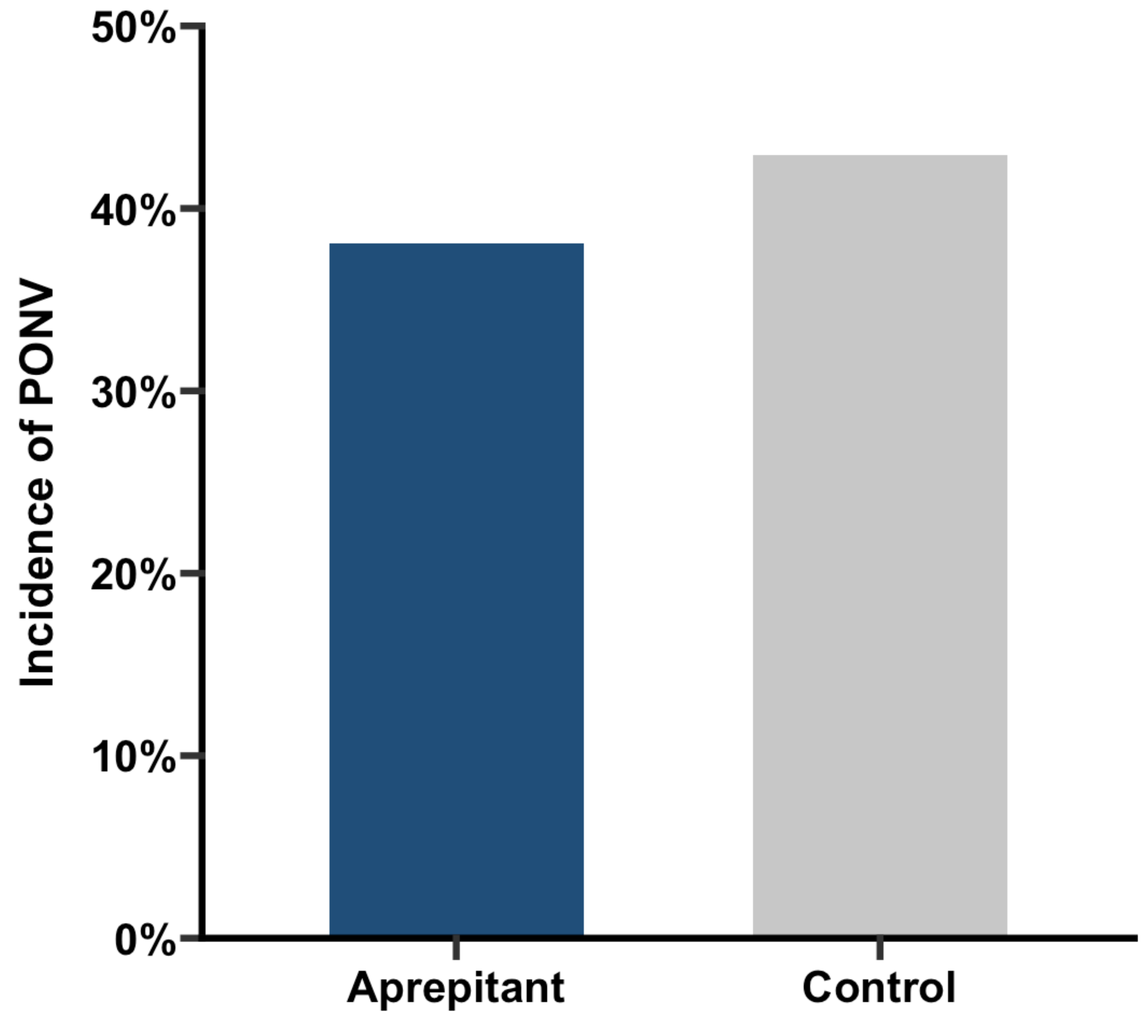


Figure 1. Incidence of PONV in patients who received pre-operative aprepitant compared to those that did not. Groups were matched for age, sex, smoking status, and history of PONV. (38.1% vs 42.9%, OR 0.86, p = 1.00)

Variable	OR	95% CI	p-value
Aprepitant given	0.52	0.13 – 1.86	0.32
Ondansetron given	0.53	0.06 – 3.50	0.52
Dexamethasone given	0.08	0.01 – 0.41	0.01 *
Scopolamine given	0.70	0.02 – 21.13	0.82
TIVA used	1.56	0.42 – 6.16	0.51
Smoker	3.28	0.31 – 43.97	0.33
ASA score	1.09	0.29 – 3.96	0.90
Procedural time	1.00	0.99 – 1.00	0.55
Intraoperative CSF leak	2.08	0.52 – 9.18	0.31

Table 3. Multivariate regression model of composite PONV endpoint with aprepitant administration and primary variable of interest with adjusted covariates. Abbreviations: PONV, post-operative nausea and vomiting; TIVA, total intravenous anesthesia; ASA, American Society of Anesthesiology; CSF, cerebrospinal fluid; OR, odds ratio; CI, confidence interval

Conclusions

1. 41.3% of patients undergoing ESBS experienced PONV
   - 38.1% of patients who received pre-operative aprepitant experienced PONV
   - 42.9% of patients who did not receive pre-operative aprepitant experienced PONV
2. Post-operative bleeding rates did **not** change with pre-operative aprepitant
3. Despite targeted anti-emetic pharmacotherapy, rates of PONV in patients undergoing ESBS remain high

Contact: Anuj Patel, MD (apat@health.ucdavis.edu)

References:

1. Korkut AY, Erkalp K, Erden V, et al. Effect of pharyngeal packing during nasal surgery on postoperative nausea and vomiting. Otolaryngol Head Neck Surg. 2010;143(6):831-836. doi:10.1016/j.otohns.2010.08.030
2. Lee DJ, Douglas JE, Chang J, et al. The use of aprepitant for the prevention of postoperative nausea and vomiting in endoscopic transsphenoidal pituitary surgery. Int Forum Allergy Rhinol. 2023;13(12):2180-2186. doi:10.1002/alr.23208
3. Chen S, Lu M, Liu D, et al. Human substance P receptor binding mode of the antagonist drug aprepitant by NMR and crystallography. Nat Commun. 2019;10(1):638. Published 2019 Feb 7. doi:10.1038/s41467-019-08568-5
4. Navari RM, Aapro M. Antiemetic Prophylaxis for Chemotherapy-Induced Nausea and Vomiting. N Engl J Med. 2016;374(14):1356-1367. doi:10.1056/NEJMra1515442