

Prevalence of Postoperative Nausea and Vomiting(PONV) in Patients Undergoing Spinal Surgery Under General Anesthesia

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Objective

- Postoperative nausea and vomiting (PONV) occur in approximately 30% of patients receiving general anesthesia.
- Although PONV is uncomfortable, hinders early ambulation, and greatly reduces patient satisfaction, there have been few reports of studies on the incidence of PONV after spinal surgery.
- This study investigated the prevalence of PONV in patients undergoing spinal surgery at our hospital to identify risk factors.



Material

- *Patients*: Spinal surgery under general anesthesia at our hospital
(April 2014 ~ November 2017)

289 patients: 168 men and 121 women, mean age 61years(20-93years)

- *Surgical site*: Cervical-42cases Thoracic-12cases Lumbar-235cases

- *Surgical Methods*

Cervical: Laminoplasty 32cases, ABF 5cases, Posterior Fusion(PF) 3cases, others 2cases

Thoracic: PF 5cases, Posterior decompression 4cases, others 3cases

Lumbar: Posterior decompression 126cases, PLIF 49cases, MED 47cases, PF 12cases

Subjects

- The incidence of PONV
- Sex
- Age
- Operative time
- Smoking status
- Postoperative intravenous patient-controlled analgesia: IV-PCA
- Predictive scores for PONV : Apfel score, Koivuranta score
- Surgical sites etc

Statistical Analysis

T-test, Fisher exact test, Dunn test and logistic regression analysis

Results

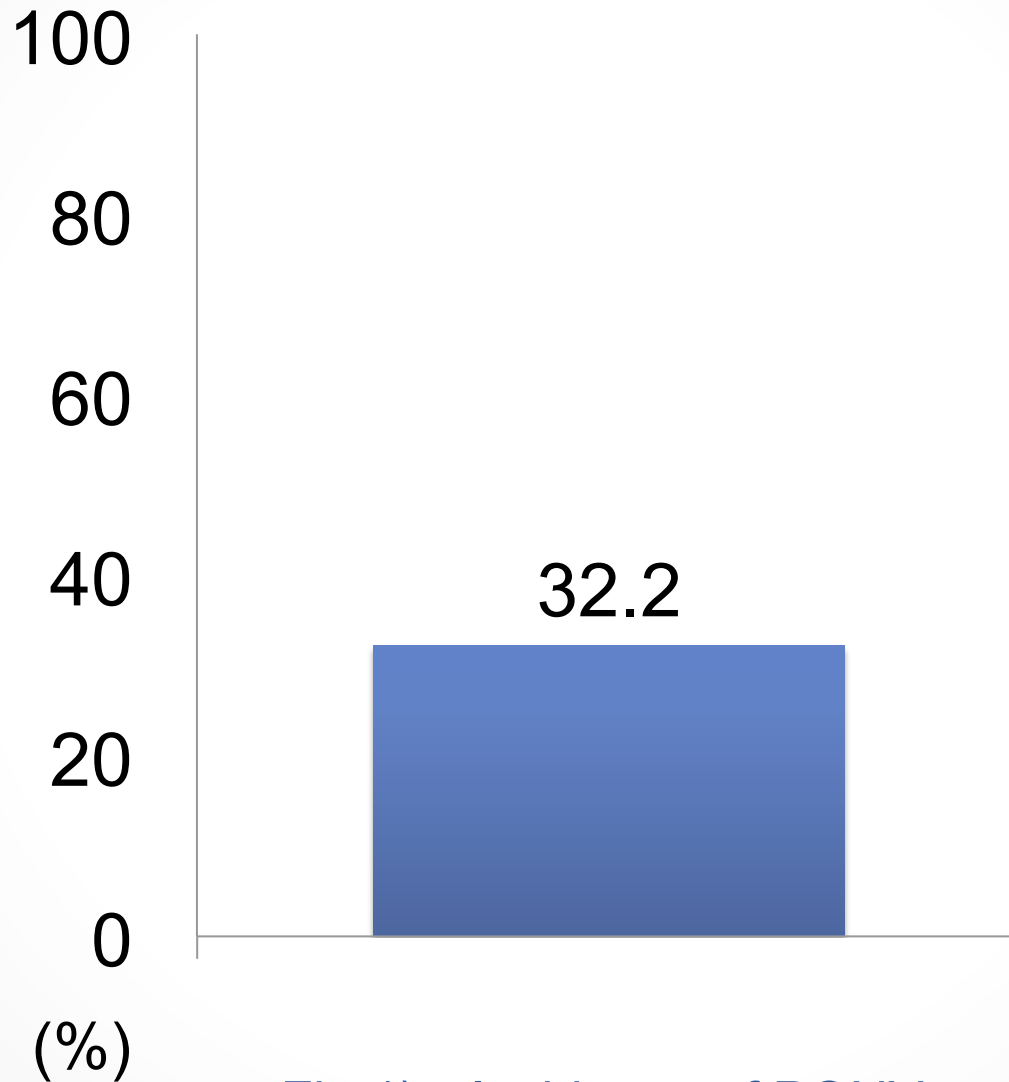


Fig.1) Incidence of PONV

*<0.05
**<0.01

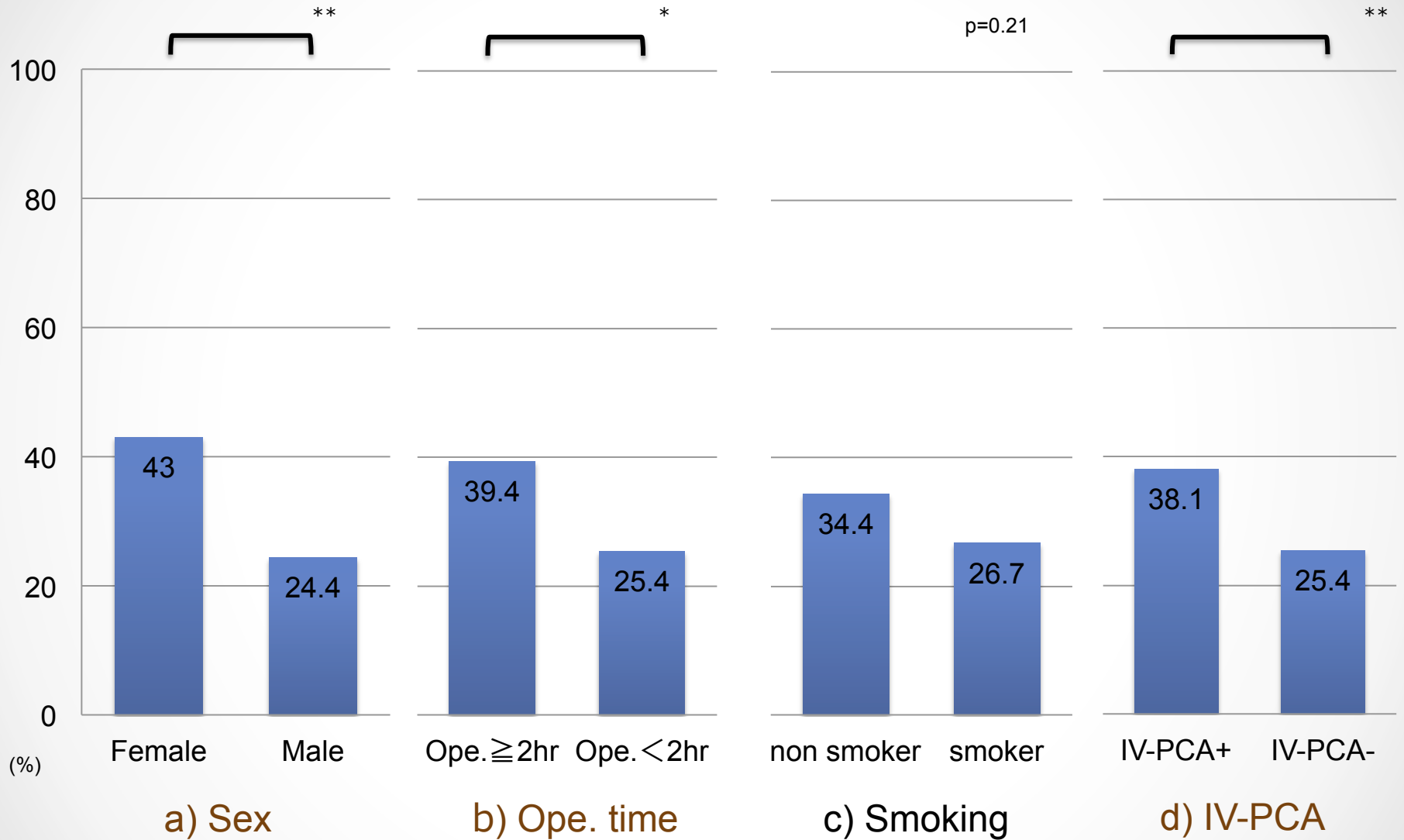
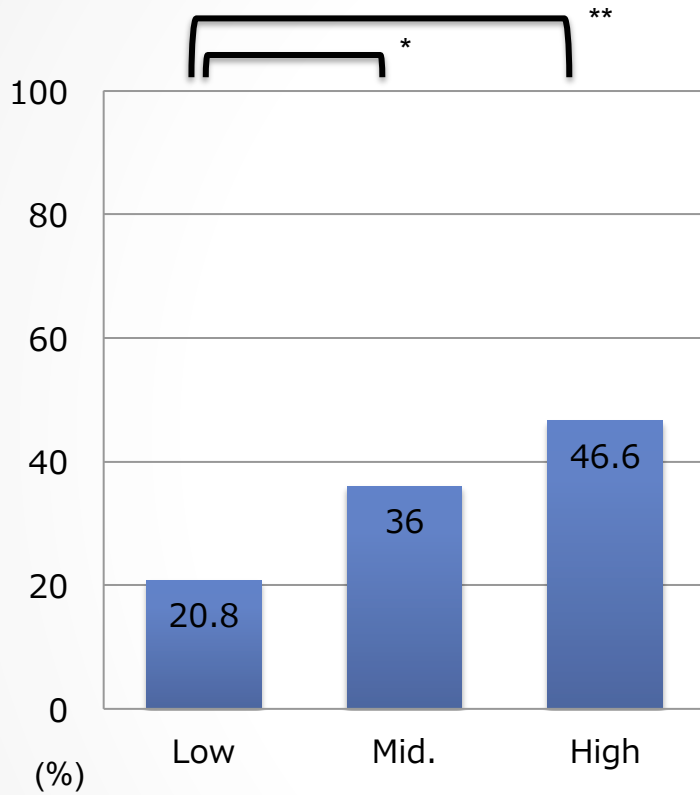
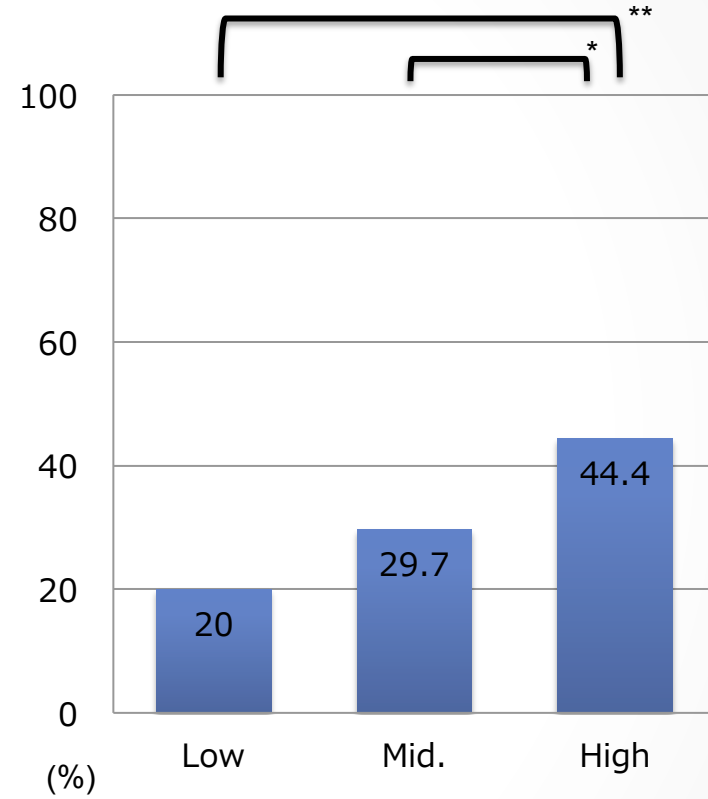


Fig.2) Comparison between two groups of risk factor

*<0.05
**<0.01



a) Apfel simplified score



b) Koivuranta's score

Fig.3) Incidence of PONV according to Risk Score

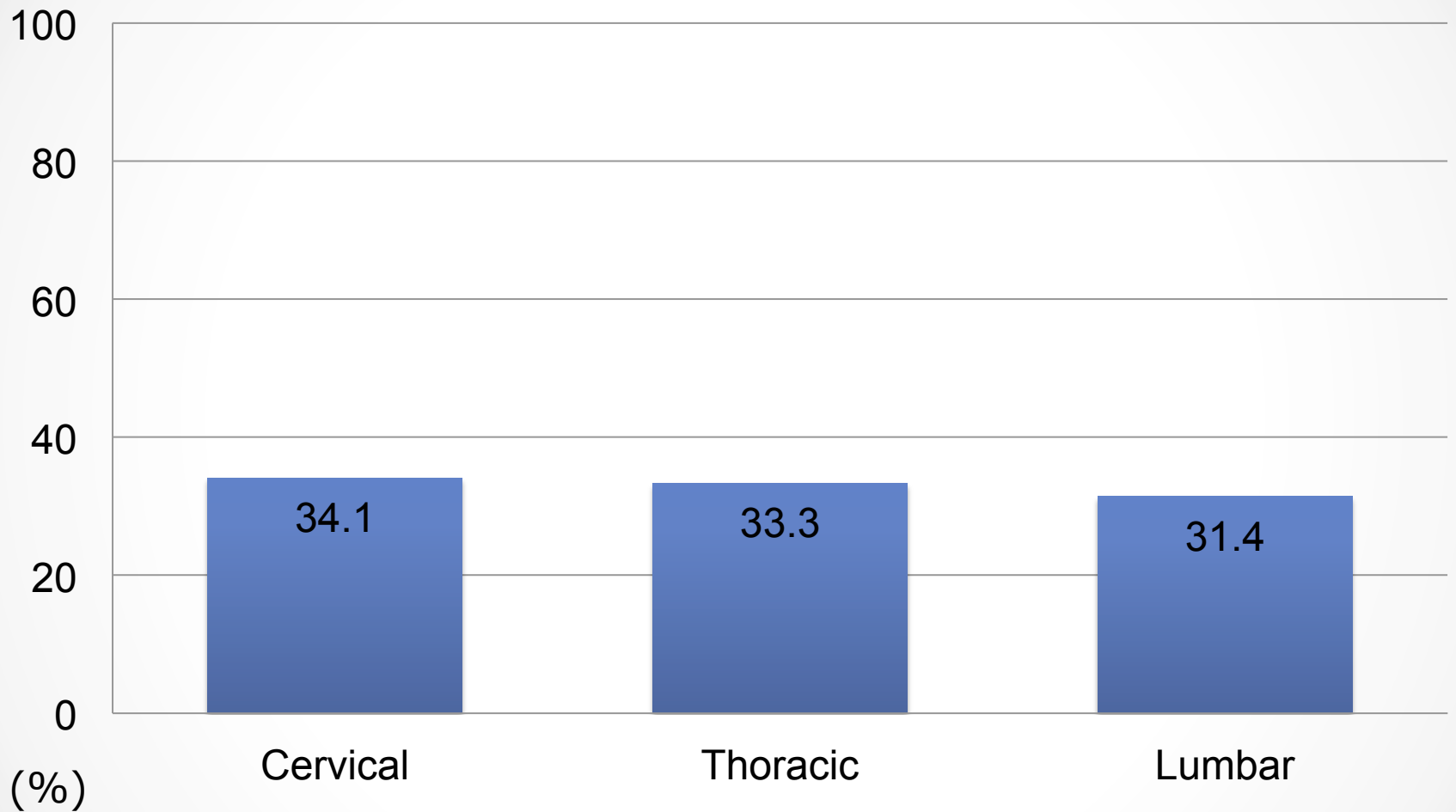


Fig.4) Incidence of PONV according to Surgical Site

Factor	Odds Ratio	95%CI Lower	95%CI Upper	P-value
Female	2.56	1.45	4.54	0.001
IV-PCA+	1.85	1.03	3.31	0.038
Ope. time \geq 2hr	1.64	0.90	3.02	0.107
Prochlorperazine+	0.83	0.46	1.46	0.519
Bleeding \geq 400ml	1.35	0.51	3.51	0.539
Non-smoker	1.06	0.57	1.97	0.855
Age < 50	0.99	0.53	1.84	0.967

Table.1) Odds ratios of risk factors for PONV

【PONV : Risk factor】

- Apfel score:

1.Female 2.motion sickness 3.non-smoker 4.Post op. opioids

PONV% 0:10% 1:21% 2:39% 3:61% 4:78%

Apfel CC, et al.: Anesthesiology 91:693-700, 1999.

- Koivuranta score:

1.Surgery>60min. 2.Female 3.motion sickness 4.History of PONV 5. non-smoker

PONV% 0:17% 1:18% 2:42% 3:54% 4:74% 5:87%

Koivuranta M, et al.: Anaesthesia 52:443-9, 1997.



【PONV : Guideline (A treatment algorithm)】

- **Medium Risk : Apfel score 2** → pick 1 or 2 Interventions

Example Dexamethasone+Ondansetron or TIVA

- **High Risk : Apfel score 3-4** → >2 Interventions/Multimodel Approach

Example Dexamethasone+Ondansetron+TIVA

Tong J, et al.: Anesthesia&Analgesis 118:2014.

【PONV : Pharmacologic antiemetics (can be used in Japan)】

- Metoclopramide

Metoclopramide is a weak antiemetic and at a dose of 10mg is not effective in reducing the incidence of nausea and vomiting.

Henzi I, et al.: Br J Anaesth 83:1999

- Prochlorperazine maleate

First-line antiemetics for opioid-induced nausea and vomiting include anti-dopamine agents (such as prochlorperazine), which act directly on the central nervous system.

National Cancer Center Hospital of Japan, et al, 2006

Administration of prochlorperazine is effective for PONV when IV-PCA is used for postoperative pain control.

Hoshino.Y, et al.: 44th ISSLS Annual Meeting 2017

Category	Name of drug	Insurance coverage(japan)	Drug price(1Euro=¥130)
NK-1 Receptor Antagonists	Apreplant	Anti-cancer drug side effects	¥3393(80mg)
5-HT ₃ Receptor Antagonists	Ondansetron	Anti-cancer drug side effects	¥3204(4mg)
	Palanosetron	Anti-cancer drug side effects	¥14937(0.75mg)
Corticosteroids	Dexamethasone	RA etc (but not for nausea)	¥170(6.6mg)
Phenothiazines	prochlorperazine	nausea	¥9.6(5mg)
	Metoclopramide	nausea	¥57(10mg)
Buthrophenones	Droperidol	Anesthesia premedication	¥112(25mg)
	Haloperidol	schizophrenia	¥89(5mg)

Conclusion

- Of 289 patients undergoing spinal surgery under general anesthesia, 93 developed PONV, with an incidence of 32.2%.
- The incidence was significantly higher in women, patients undergoing surgery lasting 120 minutes or longer, and patients using postoperative IV-PCA.
- Apfel and Koivuranta scores are useful for predicting the occurrence of PONV in patients undergoing spinal surgery under general anesthesia.

Annual Meeting of EUROSPINE 2018

COI Disclosure

The author have no financial conflicts of interest to disclose concerning the presentation.