

Title: TRANSDERMAL SCOPOLAMINE REDUCES POSTOPERATIVE NAUSEA AND VOMITING

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**Introduction.** Nausea and vomiting (N & V) is a common and occasionally incapacitating side effect of anesthesia and surgery. Many factors (age, sex, type of operation, ambulation, use of narcotics, etc.) increase the incidence of postoperative N & V and just as many therapies have been proposed to reduce it, with varied efficacies. Transdermal scopolamine patches have been used successfully to reduce motion sickness associated with sea, air and automobile travel. The objective of this study was to determine if transdermal scopolamine could significantly decrease the frequency of postoperative N & V following laparoscopy in female outpatients, a surgical population with a high incidence of these problems.

**Methods.** Following approval from the institutional review board, 191 ASA Class I or II female outpatients scheduled for laparoscopy gave informed consent and were assigned to receive in a randomized, double-blind fashion, either a placebo or scopolamine containing band-aid-like circular patch. Prior to the day of surgery and at the time of preoperative evaluation, patients were interviewed and instructed to apply the patch behind an ear the night before surgery. Each scopolamine patch delivers 0.5 mg of the drug over a 3-day period. Anesthesia was induced with methohexital (1-2 mg/kg) or sodium thiopental (3-5 mg/kg) followed by succinylcholine (1.0-1.5 mg/kg), atracurium (0.5-1.0 mg/kg) or vecuronium (0.75-1.25 mg/kg) and the trachea was intubated. Anesthesia was maintained with halothane or isoflurane (0.2-2.0%) and nitrous oxide (50-60%) in oxygen. Analgesic doses of an opiate narcotic, usually fentanyl (50-300 ug/kg) were also given. No anti-emetics were to be administered during the procedure and the incidence and duration of nausea, retching and vomiting (N, R & V) as well as possible scopolamine associated side effects were documented in the postoperative period. Symptoms and/or signs of N, R & V were elicited from both the patient and the nurse caring for the patient on an hourly basis until discharge from the hospital. Patients also received a diary card on which they were instructed to write down the time of patch removal, further incidences and the duration of N, R & V, and side effects. A phone interview was also done 24 hr after surgery. During recovery, if nausea persisted for a total of 2 hr (severe nausea) or the patient had two episodes of retching and/or vomiting, droperidol, 0.625 mg was given IV. Nausea lasting less than 2 hr (mild nausea) was not treated. Student's t and chi-square tests were used for statistical analysis. P values < 0.05 were considered statistically significant.

**Results.** Both demographics and anesthetics received were similar for the two groups. The patches were applied at similar times (11 ± 2 hr) in both groups. Patients who failed to comply with patch application or removal criteria and patients who received potentially anti-emetic medications intra-

operatively (e.g., atropine) were not included in the data analysis for efficacy but were still included in side effect analysis. Thus 53, of 191 patients were excluded and 138 subjects were considered evaluable (68 placebo and 70 scopolamine). Scopolamine treated patients experienced no N, R & V or just mild nausea more often than placebo treated patients: 44/70 (63%) vs. 26/68 (38%) (P < 0.05) (Table 1). Stated conversely, more placebo treated patients had R or V or severe N than scopolamine treated patients: 42/68 (62%) vs. 26/70 (37%) (P < 0.05). Placebo treated patients also had a greater duration of R and/or V as demonstrated by a statistically greater number of patients who had R and/or V in more than one 1-hr period in the recovery room: 28/68 (41%) vs. 16/70 (22%). In addition, only 9/70 (13%) scopolamine treated patients required droperidol, whereas 22/68 (32%) placebo patients required such treatment (P < 0.05). No serious side effects were associated with the study and the most common problems were dry mouth, dizziness, amblyopia, mydriasis, headache and somnolence (Table 2). All of these, except headache, occurred more frequently in the scopolamine treated group. Nonetheless, scopolamine treated patients were discharged from the recovery room on the average 29 min earlier than placebo patients (P < 0.05).

**Discussion.** Transdermal scopolamine was effective in reducing severe N and R & V in females anesthetized for laparoscopy, although these problems still occurred in 37% of those women treated with transdermal scopolamine. Side effects were not serious, were more common in scopolamine treated patients, and did not lengthen recovery room stay. This simple, inexpensive therapy may serve to significantly reduce postoperative N, R & V in patients undergoing operations where the incidence of N, R & V is high and/or the potential sequelae are particularly worrisome.

Table 1. Incidence of postoperative N, R or V.

	Placebo		Scopolamine	
	n	%	n	%
No N, R, V or mild N	26	38.5	44	63.0*
Severe N, R or V	42	61.5	26	37.0*
Total	68	100.0	70	100.0

\*P < 0.05: scopolamine vs. placebo

Table 2. Incidence of side effects

	Placebo (n=86)	Scopolamine (n=88)
	n	n
Headache	7	11
Dry mouth	28	80*
Somnolence	0	8*
Amblyopia	5	14*
Mydriasis	1	9*

\*P < 0.05: scopolamine vs. placebo