

THE USE OF DRAMAMINE IN CONTROL OF POSTOPERATIVE NAUSEA AND VOMITING * †

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NAUSEA and vomiting in the immediate postoperative period are frequently of much more concern than the operation. During the past years, this situation has been investigated and attempts made to alleviate this distress (1, 4, 10). Many drugs, such as nicotinic acid, cerium oxalate, sodium bicarbonate and pyridoxine, have been used with but minimal success (6, 7, 8).

Although little is known about the mechanism of this condition, the general belief is that nausea and vomiting are the external manifestations of stimulation of the central nervous system. The afferent stimuli appear to originate from two sources; vestibular stimulation mediated through the eighth cranial nerve (11), and gastrointestinal stimulation mediated through the vagus nerve (12). Hence, it is probable that postoperative nausea and vomiting is the result of stimulation of the vestibular organ as a result of either voluntary or aided movement of the patient, or irritation and stimulation of the gastrointestinal tract by the anesthetic gas or vapors, or both mechanisms.

After World War II, dramamine was used very effectively in the prevention and treatment of motion sickness. The rationale for this therapy was on the experimental basis that dramamine localizes vestibular stimulation to subcortical cerebral areas (11) and, therefore, prevents the appearance of the signs and symptoms of motion sickness (2, 3, 13).

Recently dramamine has been used in the treatment of postoperative nausea and vomiting (5). It is of this aspect that the present study was undertaken.

METHOD

Two hundred patients were studied; 100 served as controls and 100 were given the active agent, dramamine. No attempt was made to select the patients studied. The daily operation schedule was utilized and alternate cases were assigned to dramamine and to the control group. All age groups and almost all surgical procedures were in-

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cluded. An intravenous injection was chosen to assure definite absorption of the drug. Before the induction of anesthesia, 50 mg. or 1 cc. of dramamine was given (each cubic centimeter of solution contained dramamine, 50 mg.; benzylalcohol, 5 per cent; ethyl alcohol, 10 per cent; propylene glycol, 50 per cent, and water, q.s.) or 1 cc. of the control solution, which was identical except that it lacked dramamine. The injection was repeated every four hours until the patient was returned to the floor from the recovery room some two to fourteen hours after the initial injection. While in the recovery room the patients were observed regularly, and their reactions recorded. A notation was made if the patient vomited. Vomiting was noted if the motions of emesis were made regardless of the volume of emesis. When the patients were returned to their wards, their postoperative course was summarized on the recovery sheet, and became a part of their chart.

RESULTS

Table 1 shows a decrease in the amount of nausea experienced by the patients who were given dramamine as compared with the control

TABLE 1
CORRELATION OF DRAMAMINE WITH DEGREE OF NAUSEA AND VOMITING

Agent Given	Total Cases	Nauseated						Vomited					
		None	Incidence	Mild	Moderate	Severe	Very Severe	None	Incidence	Mild	Moderate	Severe	Very Severe
Control	100	60	40	14	14	10	2	61	39	13	16	8	2
Dramamine	100	74	26	16	7	2	1	82	18	10	4	2	2

group. Of the patients who were nauseated in spite of the administration of dramamine, a number did not vomit. This is in contrast to the control group in which virtually all patients who were nauseated vomited. Also, table 1 shows that of the patients who did have vomiting with dramamine, the vomiting was of less severity as compared with the controls. Our results agree with those obtained by Rubin and Metz-Rubin (5) in their study on the use of dramamine for controlling postoperative nausea and vomiting. However, our control group does not coincide with the high incidence of nausea and vomiting in their control series. Because of this difference, we do not share the opinion held by Ruben and Metz-Rubin and others that dramamine is an effective drug in the control of postoperative nausea and vomiting.

In table 2, our cases have been divided into groups according to the type of anesthetic agent used. It maybe noted that the incidence of nausea and vomiting is reduced in all but one group. The changes noted are not statistically significant, and therefore strengthen our opinion of the ineffectiveness of this drug as a routine measure. The

On the basis of figures as yet incomplete, it was observed that as the duration of anesthesia is extended the incidence of nausea and vomiting increases (9). In such cases, the value of dramamine increases with the duration of anesthesia.

In no patient was an untoward reaction to dramamine noticed. The minor side effects of generalized sedation or an occasional irritation at the site of rapid intravenous injection were observed.

CONCLUSION

Postoperative nausea and vomiting were studied in 200 patients. A decrease in incidence and severity was observed when dramamine was used. Its greatest value was noted in neurosurgical procedures. The benefits derived from the use of dramamine increase with the duration of anesthesia. We do not believe from our work with this drug that it should be considered for the routine treatment of patients suffering from postoperative nausea and vomiting.

REFERENCES

1. Rink, E. H.: Prevention and Treatment of Post-operative Nausea and Vomiting, *M. Proc.* **220**: 325-327 (Oct. 20) 1948.
2. Gray, L. N., and Carliner, P. E.: Prevention and Treatment of Motion Sickness, Seasickness. *Bull. Johns Hopkins Hosp.* **80**: 470 (May) 1949.
3. Gray, L. N., and Carliner, P. E.: Prophylactic and Therapeutic Control of Motion Sickness, *Bull. Johns Hopkins Hosp.* **84**: 254 (April) 1950.
4. Stocker, F. W.: Use of Antihistaminic Drugs in Ophthalmology, *South. M. J.* **43**: 242-244 (March) 1950.
5. Rubin, A., and Metz-Rubin, H.: The Effect of Dramamine upon Postoperative Nausea and Vomiting, Controlled Study of 250 Consecutive Surgical Patients, *Surg., Gyn. & Obst.* **92**: 415-418 (April) 1951.
6. Gordh, T., and Rydin, H.: The Question of Cerium Oxalate as Prophylactic against Postoperative Vomiting, *Anesthesiology* **7**: 526-535 (Sept.) 1946.
7. Mushin, W. N., and Wood, H. M.: Effect of Nicotinic Acid on Post-operative Vomiting, *Brit. M. J.* **1**: 719-720 (May 27) 1944.
8. Hill, F. W.: Pyridoxine in Treatment of Postanesthetic Nausea and Vomiting, *Anesthesiology* **6**: 52-53 (Jan.) 1951.
9. Smith, J. M.: Post-operative Nausea and Vomiting in Relation to Anesthetic Time, *British M. J.* **2**: 217 (Aug. 18) 1945.
10. Steele, J. D.: Narcotic as Factor in Postoperative Nausea and Vomiting, *Anesthesiology* **4**: 430-435 (July) 1943.
11. Gay, L. N.: Prophylactic and Therapeutic Control of Motion Sickness and Vestibular Disturbances, *Mil. Surgeon* **108**: 324-330 (April) 1951.
12. Gregory, R. A.: Nervous Pathways of Intestinal Reflexes Associated with Nausea and Vomiting, *J. Physiol.* **106**: 95-103 (March 15) 1947.
13. Schiff, M., Comond, M. S., and Hemwich, H. E., Medical Division Army Chemical Center Maryland: Personal Communication to the Authors.