INTRAVENOUS TRIFLUOPERAZINE (STELAZINE®) AS A POSTOPERATIVE ANTI-EMETIC

ELLEN BLATCHFORD, M.B., AND HILDA ROBERTS, F.F.A.R.C.S.*

THE PROPHYLACTIC USE of anti-emetic drugs for postoperative nausea and vomiting does not always provide the degree of protection anticipated, and it is thought to be an unnecessary practice by some anaesthetists. The treatment for this complication is usually given by an intramuscular injection of the anti-emetic drug of choice, and although this route does produce fairly quick relief, at times the effect is delayed and unpredictable. Undoubtedly the most effective method of administration of drugs for rapid results is by intravenous injection. However, one must be prepared for an accentuation of the side-effects, and the more powerful of the tranquilizing drugs can give rise to some disturbing symptoms. The piperazine group to which trifluoperazine belongs is the most potent subdivision and this fact was borne in mind when this survey was conducted.

The observations were made mainly on patients in the recovery room; the remainder of the patients were given their initial injection in their room within the first 48 hours after operation. The dosage of trifluoperazine in the first ten cases was 1 mg.; then it was found that a 2 mg. dose was much more effective. Repeat injections consisted of either 1 mg. or 2 mg., depending on the response to the first dose. The technique of administration depended on whether or not the patient was receiving continuous intravenous therapy postoperatively; if so, the solution of trifluoperazine was introduced into the tubing of the intravenous set at a distance from the needle. On the other hand, when the solution was to be introduced directly into the vein, the volume was increased to at least 5 cc. with distilled water.

A total of 211 patients were observed during this study and the various factors concerned are set out in the tables. Table I shows the distribution of the types of operation. The anaesthetic mentioned in the groups in Table II indicates the only drug used or the most potent in sequence with relaxant and narcotic or

TABLE I

Operative sites	Number of patients
Abdominal	88
Vaginal	19
Head and neck	11
Breast	16
Others	
Major	18
Minor	59
Total	211

*Department of Anaesthesia, Women's College Hospital, Toronto, Ontario.

TABLE II

Anaesthetic technique	Number of patients
Thiopentone, nitrous oxide	130
Volatile anaesthetic	47
Cyclopropane	34
Total	211

tranquillizer. The incidence and distribution and time of commencement of postoperative nausea and vomiting are shown in Table III. Table IV indicates the number of injections of trifluoperazine given within the first 48 hours of the postoperative period. Table V records the total amount of trifluoperazine administered and the number of patients in each group. Table VI gives the varying responses to treatment; good if both nausea and vomiting abated, fair where nausea persisted after vomiting had improved, and poor where condition was unchanged.

A further analysis of Table VI shows that the response is fairly consistent. Table VII indicates the response in patients exhibiting nausea and vomiting in the recovery room. Table VIII shows the response of patients who developed nausea and vomiting after having left the recovery room. Table IX presents the

TABLE III

Complication	In the recovery room	After leaving recovery room but within first 48 hours postoperatively
Nausea	86	2
Nausea and vomiting	105	18

TABLE IV

Number of injections of trifluoperazine	Number of patients
Single injection	189
Two injections	18
Three injections	4

TABLE V

Amount of trifluoperazine	Number of patients
1 mg.	10
2 mg.	190
3 mg.	2
4 mg.	5
6 mg.	3

TABLE VI

Result of treatment	Number of patients
Good	171
Fair	24
Poor	16

relation between the time of response and the number of injections required to give satisfactory relief. Table X relates the anaesthetic and type of operation in patients who received only *Fair Relief* from the injection of trifluoperazine. Table XI is similar to Table X but concerns those patients who did not respond at all to the administration of trifluoperazine.

The figures in Tables X and XI are too small to give any real insight into causation of unsatisfactory response, but it is interesting to note that although the figures pertaining to abdominal operations are higher, the minor operations have a high incidence in relation to their total number.

TABLE VII

	Good	Fair	Poor
Nausea	73	5	8
Nausea and vomiting	82	18	5

TABLE VIII

	Good	Fair	Poor
Nausea	1	0	1
Nausea and vomiting	15	1	2

TABLE IX

	Less than 15 min.	15-30 min.	30-40 min.
First injection	101	58	6
Second injection	4		
Third injection	2		

TABLE X

Operation	Thiopentane and nitrous oxide	Volatile anaes.	Cyclopropane
Abdominal	7	3	2
Vaginal	2	—	—
Head and neck	—	1	—
Breast	1	—	—
Others			
Major	1	—	—
Minor	5	—	2

TABLE XI

Operation	Thiopentane and nitrous oxide	Volatile anaes.	Cyclopropane
Abdominal	3	1	3
Vaginal	1	1	—
Head and neck	—	—	—
Breast	1	—	—
Others			
Major	—	1	—
Minor	1	2	2

SIDE-EFFECTS

A few patients complained of transient dizziness, but this did not prove to be a troublesome symptom. Hypotension occurred in twelve patients, the fall in blood pressure ranging between 10 and 50 mm. Hg. In none of these cases did the fall in blood pressure persist, and all rose to a satisfactory level within 30 minutes; but one was aware that the trifluoperazine was at least in part responsible for the fall. Potentiation of the effect of narcotics given around the same period was quite marked. At the time of these observations, minimal doses of narcotics were being given intravenously, e.g., pantopon gr. 1/12; demerol 10 mg.; dipipanone 6 mg.; morphine gr. 1/16; with good effect. In a few cases only was it necessary to repeat the narcotic during the stay in the recovery room (from two to five hours) where trifluoperazine had been administered. Respirometry recordings made on patients receiving both narcotic and trifluoperazine showed some fall in minute volume. Of 16 cases so observed, 6 sustained a fall of 1,000 to 1,500 cc.

DISCUSSION

This study indicates that satisfactory anti-emetic results can be obtained from intravenous administration of trifluoperazine. At times the change was dramatic, the patients being able to take fluids and dry melba toast within 30 minutes of injections when given on the floor. Some even ate a light meal. At the time of injection in the patients who were back in their rooms, it was emphasized that the taking of some form of nourishment was part of the treatment. There was some drowsiness associated with a good result in a small number of patients. This reaction has been noticed by workers in the psychiatric field, and may be related to the potency of the drug. There is a general appreciation that tranquillizing drugs can give rise to extrapyramidal disturbances, and that the piperazine group is the most likely to produce these effects. Ayd¹ relates both clinical potency and the incidence of extrapyramidal reactions to the chemical structure of the drug, that is to say, the piperidine ring in the side chain creating the least potency, the chlorpromazine group with a three-carbon straight side chain being more potent, and finally, the piperazine group characterized by the piperazine ring in the side chain being the most potent. Another cause of potency suggested by Ayd is the substitution of the trifluoromethyl halogen for chlorine as in trifluoperazine. One patient in this series did exhibit a dystonic reaction or dyskinesia. She was a patient with dormant multiple sclerosis who underwent a major vaginal operation. She suffered considerably from postoperative nausea and vomiting and was given three doses of 2 mg. trifluoperazine within 24 hours. Shortly after the third injection, she had, from the description of the nurse, an oculogyric crisis. The condition subsided and the patient was generally improved over the course of the next 24 hours. It was thought, in retrospect, that this patient should not have been given a third dose or that she should not have received the treatment at all. The other types of extrapyramidal reactions were not seen, i.e., akinesia, akathisia, and parkinsonism. According to Ayd,² akathisia or motor restlessness, when caused by the potent phenothiazine drugs, e.g., trifluoperazine and fluphenazine, is the most difficult to manage of the drug-induced extrapyramidal reactions.

He also observed that there seems to be a definite sex ratio in the distribution of these reactions, i.e., akathisia and parkinsonism appear three times more often in women and dystonia occurs twice as often in men. Cauffman and Pauley³ have reported a family in which the maternal grandfather, his daughter, and her six-year-old daughter developed extrapyramidal reactions whilst taking phenothiazine anti-emetic therapy. Other incidences of neurological complications occurring in association with phenothiazine derivatives in blood relations have been reported, but the number is too small for statistical analysis. The hypotensive effect of trifluoperazine given intravenously should be appreciated and, although there were no unhappy results in this series, it is not recommended as a type of therapy for older patients where a fall in blood pressure is most undesirable.

The importance of diluting the fluid for injection must be emphasized. In two or three of the early cases when the drug was injected directly into the vein without dilution, some definite discomfort was experienced by the patient. It is thought that dilution does help to act as a safeguard against venous spasm and its attendant disasters.

To recapitulate the findings of this short clinical survey on the use of intravenous trifluoperazine as a postoperative anti-emetic, it can be said that the following facts emerge:

1. Trifluoperazine appears to be a satisfactory anti-emetic when given by the intravenous route postoperatively. The results are often rapid and at times dramatic.
2. It is felt that in the majority of cases the dose of 2 mg. is sufficient and, if further medication is required, it is desirable to limit the administration to a total of two injections, lest the side-effects become troublesome.
3. The presence of neurological disorders can make the use of the drug undesirable.
4. Careful dilution of the drug with sterile water is recommended if the injection is made directly into the vein, to avoid irritation with consequent venous spasm.
5. The potentiation of the effect of narcotics or other sedatives given over the same period of time should be allowed for and the dose of the latter reduced accordingly.
6. In view of the hypotension produced in some cases, it is recommended that intravenous trifluoperazine not be used in patients where any fall in blood pressure is undesirable.
7. It need hardly be mentioned that the cause of nausea and vomiting should be accurately assessed before such treatment is instituted, in order to eliminate acute organic origin.

SUMMARY

A short survey of 211 patients receiving intravenous trifluoperazine for postoperative nausea and vomiting has been described. The types of operative procedures and anaesthetics used have been recorded. The treatment was given in the recovery room and also on the floor within the first 48 hours after operation and on the first appearance of the symptoms. The number of doses and the total

amount of the drug given to patients have been set out. The response to the treatment has been divided into three groups, i.e., good—171; fair—24; poor—16. The associated side-effects have been described and conclusions drawn from the over-all observations.

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