

EVIPAN: A PRELIMINARY REPORT ON A NEW INTRAVENOUS ANÆSTHETIC

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EVIPAN is the proprietary name of a new intravenous anæsthetic introduced during the past year by Bayer Products Ltd., Germany. This anæsthetic is the sodium salt of N-Methyl-C.-C.-cyclohexenyl-methyl-barbituric acid. It has been used in Germany in over 25,000 cases⁶ with only one death attributed to the anæsthetic. It is therefore evident that this drug has passed the purely experimental stage and its use is within the realm of practical therapeutics.

The pharmacology of Evipan has been carefully worked out and published in numerous German papers.^{1, 2, 3, 4} During the summer of 1933 I saw this drug used in the clinic of Dr. Lawrence Abel, of the Princess Beatrice Hospital, London, England, in a large variety of surgical cases which included operations on practically every region of the body. He has used this anæsthetic over 400 times. He stated to me that he considered Evipan, in selected cases, an important addition to the anæsthetics at the command of modern surgery. I have personally observed this anæsthetic used in the following types of cases: tonsillectomy, herniotomy, excision of an adenoma of the thyroid, cystoscopy, the crushing of bladder stones, appendectomy, incision of abscesses, etc. I was impressed by the simplicity of the technique of administration, the rapidity of its action, the depth of narcosis (it appeared to be merely a normal deep sleep), the lack of change of blood pressure, pulse, respiration, and colour, and the absence of the usual post-anæsthetic effects.

Winthrop & Co. having supplied me with thirty ampoules of this drug, I have used it in the past month in 22 patients covering rather a wide range of both major and minor surgery.

The 22 cases were made up of thoracoplasties 4, extrapleural wax-filling 1, open cautery pneumolysis 1, crushing and avulsion of phrenic nerve 5, intratracheal lipiodol injection 1, bronchoscopy 1, tonsillectomy 1, extraction of teeth 3, proctoscopic examination 1, sequestrectomy 1, multiple incisions for cellulitis of arm 1,

partial mastectomy 1, hæmorrhoidectomy 1. Of these 22 cases Dr. Norman Bethune has performed 14 operations, four operations were performed in the Royal Victoria Hospital and one in the Women's General Hospital. Dr. Georges Cousineau, Assistant Anæsthetist of the Sacré Cœur Hospital, assisted me in Dr. Bethune's cases.

Technique.—The drug is supplied in ampoules containing 1 gm., together with separate ampoules containing 10 c.c. of sterile distilled water. The white crystalline powder is readily soluble in this 10 c.c. of water. It is injected into the median basilic vein of the forearm with a short 18-gauge needle. It is important that the patient be draped, the area of operation prepared, and the surgeon ready to start, before the anæsthetic is commenced, as the skin incision can be made within 30 seconds after the injection.

Preliminary medication.—While the Bayer Products Ltd. do not recommend any preliminary medication, we have used both morphine and nembutal, either singly or in combination, in half our cases. In our experience and the experience of Abel, these preliminary injections both deepen and prolong the anæsthesia. In one of our cases of thoracoplasty the patient, who had received only ¼ gr. of morphine, required 0.5 c.c. of Pantopon for pain on awakening 35 minutes after the induction of anæsthesia by Evipan.

Dosage.—The following is the dosage advised by the manufacturers:—

<i>Weight in kilos.</i>	<i>Weight in lbs.</i>	<i>Dose (10 per cent solution)</i>
50	110	7.0 - 7.5 c.c.
50 - 55	110 - 120	7.5 - 8 c.c.
55 - 60	120 - 135	8 - 8.5 c.c.
60 - 65	135 - 145	8.5 - 9.0 c.c.
65 - 70	145 - 155	9.0 - 9.5 c.c.
70 - 75	155 - 165	9.5 - 10.0 c.c.
75 up	165	10.0 c.c.

Abel recommends using 2.0 to 3.0 c.c. in infants and small children.

TABLE
EVIPAN INTRAVENOUS ANÆSTHETIC IN TWENTY-TWO OPERATIONS

Case	Disease	Operation	Operator	Hospital	Amt. of Anæs.	Duration of		Comments
						Oper.	Anæs.	
1.	Bilat. pulmonary tuberculosis	Crushing phrenic nerve	Dr. N. Bethune	Sacré Cœur	c.c. 10	mins. 2	mins. 20	B.P. fell from 130 to 110; anæsthesia adequate; patient 8½ months pregnant.
2.	Unilateral pulmonary tuberculosis	Avulsion right phrenic nerve	Dr. N. Bethune	Sacré Cœur	8	6	18	Morph. gr. ¼ Scopolamine 1/150, hypo. before operation; anæsthesia perfect.
3.	Ulcerative colitis	Proctoscopic examination	Dr. G. Miller	Women's General	8	10	45.	No noticeable change in B.P., pulse, or respiration; perfect anæsthesia.
4.	Bilat. pulmonary tuberculosis	Extra pleural plombage	Dr. N. Bethune	Sacré Cœur	10	16	30	No fall of B.P.; pulse slower at end of operation; "a perfect anæsthetic".
5.	Hæmorrhoids	Hæmorrhoidectomy	Dr. G. Miller	R.V.H.	8	15	30	Perfect anæsthesia.
6.	Bilat. pulmonary tuberculosis	Crushing right phrenic nerve	Dr. N. Bethune	Sacré Cœur	4	2	20	Preliminary medication—morphine, gr. ¼; nembutal, 1½ gr. Perfect anæsthesia.
7.	Osteomyelitis of Mandible	Sequestrectomy	Dr. F. A. C. Scrimger	R.V.H.	10	15	25	Perfect anæsthesia.
8.	Bronchiectasis (Age 14)	Intratracheal injection of lipiodol	Dr. N. Bethune	Sacré Cœur	8	5	30	Patient slept for 3 hrs. Nembutal gr. ½ before; good anæsthesia.
9.	Bilat. pulmonary tuberculosis	Crushing left phrenic nerve	Dr. N. Bethune	Sacré Cœur	6	45 sec.	25	Preliminary medication—nembutal, 1½ gr., morphine, gr. ¼; good anæsthesia.
10.	Bilat. pulmonary tuberculosis	Third stage thoracoplasty (4 ribs)	Dr. N. Bethune	Sacré Cœur	10	7 mins.	29	Restless on awakening; went to sleep after 0.5 c.c. pantopon; perfect anæsthesia.
11.	Pulmonary tuberculosis	Phrenicectomy	Dr. Georges Deshaies	Sacré Cœur	6	3.5	13	Preliminary medication, 1½ gr. nembutal.
12.	Cellulitis of forearm	Multiple incisions	Dr. F. A. C. Scrimger	R.V.H.	10	10	30	Satisfactory anæsthesia.
13.	Tonsillitis	Tonsillectomy and adenoidectomy	Dr. Bray	Sacré Cœur	3	6	30	Patient very excited for several hours and had tetanic convulsions (see note in text).
14.	Dental caries	Extraction of two teeth	Dr. Baillargeon	Sacré Cœur	2	2	5	Wide awake without; symptoms in 5 mins. walked to ward.
15.	Dental caries	No operation	Dr. Baillargeon	Sacré Cœur	2 repeated in 5 mins.	No anæsthesia obtained		Weight 185 lbs.; dose insufficient.
16.	Pulmonary tuberculosis	Upper stage thor. (3 ribs)	Dr. N. Bethune	Sacré Cœur	7.5	18	35	No change in pulse throughout operation.
17.	Bilat. pulmonary tuberculosis	Cautery open pneumolysis	Dr. N. Bethune	Sacré Cœur	8	31	25	(No preliminary medication.) Gas and oxygen required for last 5 mins. Induction without difficulty.
18.	Bilat. bronchiectasis	Bronchoscopy	Dr. N. Bethune	Sacré Cœur	7	5	25	No preliminary medication—anæs. of deeper and longer duration than required.
19.	Bilat. pulmonary tuberculosis	Antero-lateral thoracoplasty with aspiration of empyema	Dr. N. Bethune	Sacré Cœur	7.5	23	40	Preoperative medication, nembutal, 1.5 grs., an additional 1½ c.c. of evipan after 20 mins.; perfect anæsthesia.
20.	Pulmonary tuberculosis	Antero-lateral thoracoplasty	Dr. N. Bethune	Sacré Cœur	7.5	8	20	Preoperative medication, nembutal, gr. 1½; morphine, gr. ¼; vomited once on awakening—anæsthesia perfect.
21.	Dental caries	Extraction of five teeth	Dr. Baillargeon	Sacré Cœur	3	1½	3	Patient able to walk in 5 mins. "a remarkable and perfect anæs."—Dr. Baillargeon.
22.	Abscess of breast	Partial mastectomy	Dr. Schaffner	R.V.H.	8	30	20	No preliminary medication. Required gas and O ₂ for last 10 mins.

COMMENTS

Evipan appears to be, in our limited experience, a valuable anæsthetic in properly chosen cases. Undoubtedly with further experience the proper dosage and the amount of preliminary medication, if and when necessary, will be determined with a higher degree of accuracy than we are at present able to state.

Within 30 seconds after slow injection the patient falls into what appears to be a deep sleep. The operation can be commenced immediately. There may be slight movement on making the skin incision, but this movement is not aggravated as one proceeds. The colour of the skin and mucous membranes does not change. Dr. Bethune commented on the bright redness of the blood in the wounds as compared with the dark red colour of the blood in cases having gas and oxygen anæsthesia. The blood pressure rose 10 points in 2 cases, remained stationary in 4, and fell from 5 to 20 points in the remaining cases. The pulse fell 10 to 20 points in 6 cases, remained stationary in the 6 others, and rose from 10 to 40 in the remainder. The respiratory rate remained practically unchanged.

Awakening in all cases but four was gentle and gradual and unattended by symptoms of excitement. One patient vomited once, which may have been due to the preliminary morphine. One patient, a case of phrenic nerve avulsion, who had received nembutal and morphia before the operation, complained of temporary dimness

of vision for two days. Examination of the fundi was negative. This complaint could not be substantiated by objective findings. The examination of the urine was negative and the symptom disappeared completely. The cause was not discovered. Two patients showed emotional excitability after consciousness returned. This lasted for fifteen to thirty minutes, and was relieved by Pantapon. One patient, a child of 8, weighing 45 lbs., after tonsillectomy, who had received 3.5 c.c. solution, exhibited tetanic convulsions and tachycardia for three hours. The anæsthesia was perfect. These phenomena occurred on awakening.

On questioning patients, especially those who had previously received gas and oxygen for former operations, the unanimous opinion was that this anæsthesia was, from their point of view, the best that they had ever received. The thoracoplasty patients, who had already been subjected to two and in one case three previous operations under gas and oxygen, were the most enthusiastic. In my opinion, if further investigation confirms my present experience, this drug may become as valuable to the surgeon as ether or novocaine for suitably chosen operations.

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Complete bibliography may be obtained on request.

SOME NEWER TESTS OF RENAL FUNCTION*

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NO organ in the human body can compare with the kidney in the number and variety of tests devised to aid the physician in the study of its functions in health and disease. The illustrious names preserved in the nomenclature of its minute anatomy, Malpighi, Bellini, Henle, Bowman; recalled in the consideration of its physiological activity, Ludwig, Heidenhain, Cushny; or made use of in describing its pathological changes, Bright, Virchow, Wilks, Johnson, Fahr; attest to the importance in which

the kidney has been held since the beginning of scientific medicine.

Bright separated the group of diseases associated with his name from all others by pointing out the association in them of three things—dropsy, a heat-coagulable protein in the urine, and gross pathological changes in the kidney. For some decades physicians and pathologists disputed over whether the various forms of this disease were separate entities or varying degrees of the same morbid process.

No sooner was the condition recognized as due to anatomical alterations in the kidney than

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