

## AN INVESTIGATION ON THE EFFECTS OF EVIPAN SODIUM ON THE BLOOD SUGAR OF THE RABBIT

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THE sodium salt of cyclohexenylmethyl-N-methyl barbituric acid (evipan sodium) is a comparatively new basal anæsthetic. It is supposed to have the property of inducing surgical anæsthesia for short periods of about 15 to 20 minutes. It has a wide margin of safety and so it has gained considerable popularity as a general anæsthetic in surgical procedures of short duration.

Anæsthetics in general have a considerable effect on the blood sugar. So far as the drugs of the barbituric acid group are concerned, contradictory results have been reported. While anæsthetic doses of barbiturates, according to some observers, cause no change in the blood sugar level of normal fasting animals, others have found marked hyperglycæmia, *e.g.*, Underhill and Sprunt (1927) with amytal on the rabbit, Weiss (1926) with amytal, medinal, and sodium iso-allyl propyl-barbiturate on the cat and the dog, and Bang (1913) with veronal on the rabbit. Kennedy and Narayana (1934) working with sodium evipan found no appreciable effect on the blood sugar in doses varying from 45 to 90 milligrammes per kilogramme of body weight in the guinea-pig and 40 to 100 milligrammes per kilogramme of body weight in the rabbit.

Considering the fact that other barbiturates do produce hyperglycæmia, as some experimenters report, we thought fit to reinvestigate whether this new anæsthetic, *i.e.*, evipan sodium, which also belongs to the barbituric acid group, has any effect on the blood sugar.

### TECHNIQUE

Blood sugar estimation was done by Maclean's method which has given very satisfactory results for the last few years with one of us (S. P.).

Rabbits were employed all through the present observations. Blood samples were collected from the ear veins, the animals being treated with great gentleness so as to ensure as little excitement as possible. The anæsthetic was always prepared fresh and injected intraperitoneally in 5 per cent concentration.

The rabbits were starved overnight and experiments were carried out early next morning. The dose used, generally, was 60 milligrammes per kilogramme of body weight, but lower and higher doses, *i.e.*, 40 and 80 milligrammes per

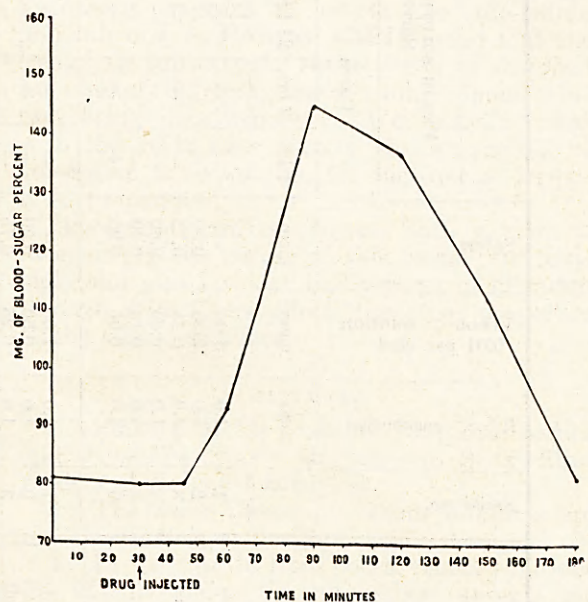
kilogramme, were also employed. Blood sugar was determined at intervals of half an hour for 2 to 3 hours. In some cases earlier samples were also taken. Control experiments were done by injecting saline intraperitoneally and the results were also confirmed by repeating the same experiment on each rabbit twice at intervals of 4 to 5 days.

### RESULTS AND DISCUSSION

Soon after the injections of the evipan sodium in anæsthetic doses the animals began to shiver, respiration became hurried and their eyes rolled up and down. After a temporary period of restlessness, the animals became quiet and would lie down with the muscles relaxed. Some of the animals exhibited slight retraction of the head and opisthotonos. With a dose of 60 milligrammes per kilogramme of body weight hypnosis came on within 3 to 5 minutes and lasted on an average for 50 minutes. With a dose of 80 milligrammes per kilogramme the respiration was slowed down considerably and hypnosis came on within 2 minutes and lasted longer. Malloney and Hertz (1935) found that 60 milligrammes produced hypnosis 3 minutes after injection and this lasted for a period of 44 minutes on an average.

Blood sugar estimations of the rabbit under observation before and during anæsthesia showed a distinct rise as will be evident from

GRAPH



Rabbit, male, weight 1.66 gm.

The curve shows the effect of injecting 100 mgm. evipan sodium. The injection was given at the arrow mark.

the table below. The table shows the pre-anæsthetic blood sugar percentage, and the average blood sugar percentages during anæsthesia and recovery. In one experiment, however, instead of the usual rise, a fall in the blood

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sugar was noticed with a dose of 60 milligrammes per kilogramme. This was probably due to a high initial blood sugar level as a result of excitement.

It will also be seen that with a dose of 40 milligrammes per kilogramme of body weight the increase in blood sugar above the fasting level was about 9 per cent on an average; with a dose of 60 milligrammes per kilogramme the rise was about 22 per cent in a majority of experiments, although a group of 6 rabbits exhibited an average rise of even 50 per cent over the fasting level.

TABLE

Evipan sodium in mgm. per kgm. of body weight	BLOOD SUGAR IN MGM. PER CENT		
	Fasting level	During anaesthesia, 1 hour after injection of evipan	During recovery, 1½ hours after injection of evipan
40	93	106	..
40	112	118	..
40	100	106	..
40	106	119	..
60	102	112	100
60	112	143	..
60	125	153	125
60	120	150	120
60	68	75	70
60	68	82	72
60	75	110	110
60	80	120	110
60	70	98	80
60	78	110	101
60	87	145	115
60	70	113	..
60	112	100	87
60	81	145	137

It was further found that the rise in blood sugar was evident half an hour after the injection, the highest level usually being attained in about an hour. Earlier samples did not exhibit any appreciable change. After an hour, the blood sugar began to fall gradually, returning to its normal level, generally, in 2 to 2½ hours from the time of injection of the anaesthetic. The curve in the graph is from a typical experiment; it shows that there was no rise for 15 minutes after the injection, the highest rise was obtained an hour after the injection and the blood sugar returned to the pre-anaesthetic level 2½ hours after the injection of the anaesthetic.

Evipan sodium thus behaves like the other drugs of the barbituric acid group in raising the blood sugar although Kennedy and Narayana (1934) report no change. Since the majority of workers have found increases in blood sugar with different barbiturates, it is quite probable that evipan sodium in common with the other barbiturates also raises the blood sugar. Regarding the mechanism of the rise in blood sugar it is probable that the sugar is released

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## FLUORESCEIN IN LEPRO REACTION ✓

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## INTRODUCTION

THE beneficial effects obtained by the use of 'Mercurochrome-220 soluble', a fluorescein compound of mercury, in leprosy cases, especially in prolonged lepra reactions, in arthritis of leprosy as well as of undetermined origin, and in *Bacillus coli* septicaemias, etc., were first recorded in India, by the present writers in Rao and Ray (1932). Since then, other workers, notable among them being Muir and Chatterjee (1932 and 1933) and Chatterjee (1933), have attempted to study the action of Mercurochrome as well as that of one of its constituents, viz, fluorescein, in leprosy. Ryrie (1934) has further continued to study the influence of fluorescein on 'lepra reaction', and has concluded that in a fairly large proportion of such reacting cases, fluorescein appears to be beneficial.

In view of the favourable opinion expressed by Ryrie and also in view of the fact that we occasionally come across cases of prolonged reactions which are not much benefited by any accepted routine treatment, such as hospital regime, with potassium antimony tartrate injections supplemented by calcium therapy and salicylates by the mouth, etc., we thought it

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from the liver as a result of liberation of adrenalin from the suprarenal medulla or by producing a disturbance in and around the thalamus as has been suggested by Weiss (1926) in the case of amytal.

## SUMMARY

Evipan sodium in anaesthetic doses raises the blood sugar of the rabbit.

## ACKNOWLEDGMENTS

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