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## Acute Barbital Poisoning in Dehydration and Diuresis.

THEODORE KOPPANYI, WILLIAM S. MURPHY AND STEPHEN KROP.

*From the Department of Pharmacology and Materia Medica, Georgetown University School of Medicine*

In several previous communications[1, 2, 3] we brought forth some evidence showing that diuretic measures increased neither the rate nor the percentage of elimination of barbital, nor did they shorten the recovery period from barbital depression. Since Gower and Van de Erve[4] recently again stated definitely that diuresis hastens recovery from barbital poisoning, and because of the practical therapeutic importance of the matter involved we decided to reinvestigate the problem.

Dogs were used throughout the experiments. Sodium barbital was administered in doses ranging from 225 to 600 mg. per kg. intravenously. Diuresis was produced by intravenous injection of appropriate doses of 10% glucose, physiological salt solution, 3% calcium chloride, and from 0.5 to 1.0% ammonium chloride. In

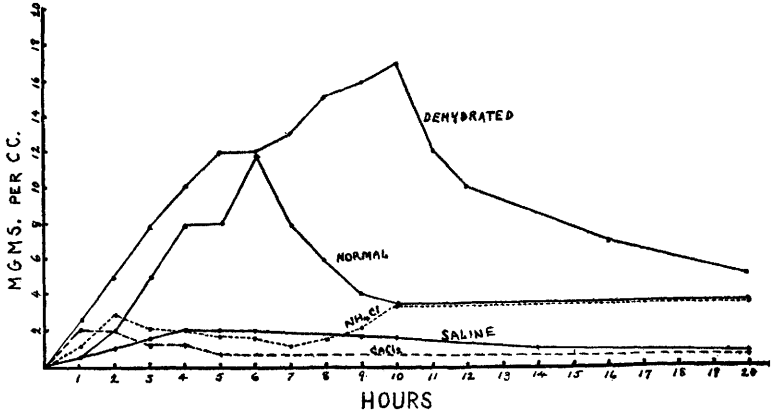


Figure 1.

Concentration of barbital in milligrams per cubic centimeter of urine over a period of 20 hours. The normal, dehydrated, and the saline treated dog received 300 mg. per kilo, the ammonium chloride, and the calcium chloride treated dogs received 225 mg. of sodium barbital per kilo.

[1] Koppanyi, Murphy, and Krop, PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 542.

[2] Koppanyi, Murphy, and Krop, PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 1495.

[3] Koppanyi, Murphy, and Krop, *Arch. Int. Pharm. Therap.*, 1933, **46**, 76.

[4] Gower and Van de Erve, *J. Pharm. and Exp. Therap.*, 1933, **48**, 141.

contrast to the diuretic measures, dogs were dehydrated by withholding of fluids for 48 hours and by bleeding (12 cc. of blood per kg. withdrawn from the saphenous vein) immediately before barbital administration.

These intravenous injections were carried out by slow infusion with a burette, the total volume being injected during a period of from 10 to 12 hours. The animals, if they survived either procedure, were again given the same dose of barbital about 2 weeks following the first injection.

TABLE I.

| Dog No. | Dose Na Barbital mg. | Treatment | Urine volume during 48 hours cc. | excreted % | Recovery in hours | Remarks |
|---|---|---|---|---|---|---|
| 1 | 300 | Dehydration and 12 cc. per kg. bleeding | 255 | 30.1 | Died in 48 | Glomerular damage to the kidneys |
| 2 | 300 | Same | 370 | 84.0 | 43½ | |
| 3 | 300 | Same | 115 | 82.0 | 40 | |
| 4 | 300 | 1000 cc. Ringer, 100 cc. per hr. | 1036 | 75.5 | 47 | |
| 5 | 300 | Same | 829 | 81.0 | 46½ | |
| 6 | 300 | No treatment | 439 | 94.5 | 26 | |
| 7 | 300 | " | 114 | 62.9 | 48 | |
| 8 | 300 | " | 347 | 75.7 | 46 | |
| 9 | 300 | " | | | 46 | |
| 10 | 300 | " | 436 | 75.8 | 45 | |
| 11 | 300 | " | | | 25 | |
| 12 | 226 | 720 cc. 0.5% $NH_4Cl$ in 8 hrs. | 579 | 85.5 | 28 | |
| 13 | 225 | 236 cc. 5% $NH_4Cl$ by mouth | 665 | 82.1 | 22½ | |
| 14 | 225 | 180 cc. 3% $CaCl_2$ in 5 hrs. | 165 | 3.6 | Died in 11 hrs. | |
| 15 | 225 | 160 cc. 3% $CaCl_2$ in 6 hrs. | 446 | 23.8 | Accidentally killed in 6½ hrs. | |
| 16 | 225 | 720 cc. 0.5% $NH_4Cl$ in 8 hrs. | 615 | 66.4 | 47 | Sick dog |
| 17 | 600 | Same | 469 | 29.1 | Died in 7 hrs. | |
| 18 | 600 | 300 cc. 1% $NH_4Cl$ in 3 hrs. | 35 | 8.6 | " "3 hrs. | |
| 19 | 600 | No treatment | 66 | 1.9 | " "2 hrs. | |
| 20 | 600 | 179 cc. 2.5% $Na_2SO_4$ in 30 min. | 48 | 2.3 | " "1 hr. | |
| 21 | 600 | 10 mg. picrotoxin every 20 min. for 100 min. plus 20 cc. .5% $NH_4Cl$. 160 cc. .5% $NH_4Cl$ by vein in 6½ hrs. 275 cc. .5% $NH_4Cl$ by muscle in 2½ hrs. 8 mg. picrotoxin after 5 hrs. | 299 | 59.3 | " "9½ hrs. | Aver. conc. barbital in urine—9 mg. per cc. |

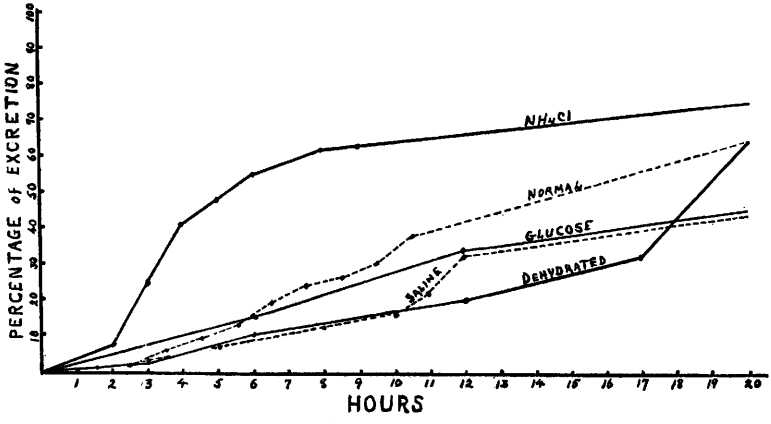


FIGURE 2.

Percentage of excretion of barbital in urine of a dehydrated, normal, and 3 diuretic dogs (10% glucose, physiological salt solution, and ammonium chloride.)

As Table I shows, dehydration did not prolong the recovery time nor did the saline diuresis carried out according to the method of Gower and Van de Erve shorten the duration of the barbital narcosis. In fact, no diuretic procedure seemed to have any significant effect on the duration of barbital anesthesia. However, as the comparison of Graphs I and II shows, there is a very striking effect of $NH_4Cl$ on the rate of elimination of barbital.

In conclusion we might say that the supposed beneficial effects of glucose and physiologic saline in barbital poisoning may be disregarded and that ammonium chloride diuresis even though it did not appreciably shorten the period of depression did definitely increase, unlike glucose or salt solution, the rate of elimination of barbital.

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## Failure to Enhance the Growth of B. Leprae by Wherry's Gaseous Method ($CO_2$, $O_2$ Environment).

C. W. DUVAL AND R. A. HOLT.

*From the Department of Pathology and Bacteriology, Tulane University.*

One of us (Duval[1]) reported the observation that the acid-fast bacillus of Hansen in removed pieces of leprous tissue continued slowly, over a period of months, to multiply and that the micro-

[1] Duval, C. W., *J. Exp. Med.*, 1910, **12**, 649.