7080 P

Potentiation of Antidotal Action of Sodium Tetrathionate and Sodium Nitrite in Cyanide Poisoning.

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In a previous communication we[1] reported the synergism and potentiation of the antidotal action of sodium or amyl nitrite and sodium thiosulphate against cyanide poisoning. The combination of sodium thiosulphate with sodium nitrite proves to be better than with amyl nitrite. It becomes interesting to ascertain whether or not sodium tetrathionate will similarly potentiate the detoxifying action of sodium nitrite, since the tetrathionate has been shown to reduce the toxicity of hydrocyanic acid by Foresti[2] and Draize.[3] In a series of experiments with dogs our results reveal exactly the same synergism and potentiation that occur with sodium thiosulphate.

With the combination of sodium nitrite and sodium tetrathionate,* at least 3 dogs out of groups of 5 survived 13 or less M.L.D.'s of sodium cyanide; whereas, with sodium nitrite alone only 4 M.L.D's and with sodium tetrathionate alone 3 M.L.D.'s of NaCN were detoxified. The antidotal effect of sodium nitrite and sodium tetrathionate given together thus exceeds the sum of those contributed individually by sodium nitrite and sodium tetrathionate. It is therefore another case of potentiation of action.

The nitrite-tetrathionate combination is apparently efficacious in the late stages of cyanide poisoning. Dogs receiving large doses of NaCN have completely recovered at the point of respiratory failure. The following protocol can be taken as an example of our experiments:

Dog, male, weighed 13.2 kg.

10:59 a. m.—p. (pulse rate) 112, r. (respiratory rate) 48.

11:04—injected subcutaneously 72 mg. of NaCN per kg. of body weight (12 M.L.D.'s).

11:10—clonic convulsions and labored breathing.

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1 Chen, K. K., Rose, C. L., and Clowes, G. H. A., PROC. SOC. EXP. BIOL. AND MED., 1933, **31**, 250.

2 Foresti, B., *L'Ateneo parmense*, 1931, **3**, No. 6, through *Revist. Sud-Amer.*, 1932, **15**, 628.

3 Draize, J. H., *Science*, 1933, **78**, 145.

* A part of the sodium tetrathionate used in this investigation was kindly supplied by Dr. O. A. Beath, the Agricultural Experimental Station, University of Wyoming, to whom we acknowledge our indebtedness.

11:12—corneal reflex disappeared and respiration suddenly ceased. The animal was at once injected intravenously $NaNO_2$ 22.5 mg. per kg., followed by $Na_2S_4O_6$ 500 mg. per kg.
11:15—p. 68, r. 12; corneal reflex returned.
11:16—p. 108, r. 92.
11:25—p. 166, r. 132 (panting).
11:31—raised its head.
12:14 p. m.—injected intravenously $NaNO_2$ 10 mg. per kg. and $Na_2S_4O_6$ 125 mg. per kg.
12:23—up on its feet.
12:25—p. 156, r. 80.
1:18—p. 160, r. 20.
2:05—drank water.
4:45—ate food, urinated.
8:00 a. m. next day—no obvious untoward effects.

We have also studied the combination of methylene blue and sodium tetrathionate or thiosulphate in cyanide poisoning, and observed a synergistic action. The results are, however, much less striking.

7081 C

Glycogen Formation after Oral Administration of Mannitol to White Rats.

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Glycogen formation is stated to occur after the oral administration of mannose to animals, but the conversion of mannitol, the hexahydric alcohol which may be obtained by reduction of the aldehyde group of mannose, to glucose or glycogen has not been definitely proven. It has been maintained that sorbitol,[1] the hexahydric alcohol derived from glucose, may alleviate the hypoglycemic symptoms in rabbits which have received insulin and when administered to diabetic patients may increase the respiratory quotient. Rosenfeld[2] was unable to observe any significant increases in liver glycogen after feeding mannitol to dogs. Pflüger[3] in a crit-

[1] Reinwein, H., *Deut. Arch. klin. Med.*, 1929, **164**, 61.

[2] Rosenfeld, G., *Centr. inner Med.*, 1900, **21**, 177.

[3] Pflüger, E. F. W., *Das Glykogen und seine Beziehungen zur Zuckerkrankheit*, Bonn, 1905, 2nd Ed., 215.