

and as postulated by Weiss and Davis,¹ in both instances involve the soma as an integral part of the reference of pain. In this connection, it is important to recognize that disappearance of pain after blocking the somatic component does not exclude the diagnosis of visceral disease as the initiating cause of pain.¹⁴ There is even some evidence that reflex coronary vasodilatation may follow the termination of the vicious cycle by precordial local anesthesia and that the visceral lesion is thus subject to influ-

ences from somatic trigger mechanisms.¹⁵

Conclusion. Data secured in 9 patients with effort angina and acute myocardial infarction indicate that local block of somatic trigger areas by procaine infiltration or ethyl chloride spray under suitable conditions may afford complete and prolonged relief of pain. Because of their simplicity and effectiveness, these procedures deserve extensive clinical trial.

¹⁵ Lindgren, I., *Nordisk Medicin*, 1946, **29**, 523; (Abs.) *J. A. M. A.*, 1946, **131**, 1536.

¹⁴ Gorrell, R. L., *Am. J. Surg.*, 1944, **63**, 102.

15645 P

Toxic Effects in Scorbutic Guinea Pigs Produced by Large Doses of Thiamin.*

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During the study of the effects of administration of thiamin to scorbutic and non-scorbutic animals, it was observed that young scorbutic pigs fed large amounts of thiamin sometimes develop irreversible symptoms after the resumption of a normal diet. The strength of the jaw muscles decreases and the animals are unable to chew their food properly, although they appear hungry and persistently try to eat. There is also decreased control of jaw muscles and the animals often spend long periods with jaws constantly opening and closing in a rapid chewing motion. This condition sometimes becomes permanent until death. The lack of muscle control is also often manifested by a shivering movement of the face accompanied by chattering of the teeth. In some cases the mouth is distorted and the muscles involved are in spastic contraction, causing the animals to claw the face in attempts to

relieve the spasm. These muscle dyscrasias are usually accompanied by increased salivation or loss of saliva which may be due to difficulty in swallowing.

The symptoms, once established, have been found irreversible and the animals inevitably die. Attempts to avert death by forced feeding, administration of large amounts of synthetic ascorbic acid or by offering green food have failed to keep the animals alive longer than one month.

Death is not primarily due to starvation, for if the food offered is well macerated these animals consume amounts normal for their size. At death the animals are extremely emaciated. (Pigs weighing 400 g initially, decreased to 270-300 g). At autopsy macroscopic hemorrhagic areas are found to vary inversely with the length of time the animals have lived after the onset of symptoms.

Several methods of producing the thiamin effect have been tried. The procedure giving the highest incidence was as follows:

Animals were fed a diet of Olympic rabbit pellets and water, until weight gain ceased and loss of appetite, joint stiffness and tender-

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ness were observed. The time required for these signs to appear was about 15 days. At that time the daily diet was supplemented by oral administration of 25 mg of thiamin hydrochloride in aqueous solution. When the animals became acutely ill with scurvy, usually after 10 days, the thiamin hydrochloride was withdrawn and green food was offered freely. The animals were allowed this diet until definite signs of improvement were seen. At that time the green food was removed, administration of thiamin hydrochloride was resumed and the animals were again brought to the stage of acute scurvy. Repeated treatment in this sequence was employed.

The thiamin effect has been produced in 12 pigs by this procedure, or in roughly one-third of the animals subjected to the treatment. The effect has also been observed in 6 pigs made scorbutic and given thiamin according to variations in the above method.

No explanation for the symptoms or cause of death can be given at this time. Death

was apparently not due to starvation, for when food was offered in macerated form enough was ingested to maintain life. Death did not appear to be due to scurvy *per se*, for animals maintained on macerated green food after the development of the symptoms and which had lived for a time after being placed on this diet did not show the usual signs of scurvy at autopsy. Death appears to have been due to some irreversible effect caused by the superimposition of large amounts of thiamin during scurvy. We have not succeeded in producing apparent toxic effects in normal guinea pigs by giving large doses of thiamin.

Pigs have been most susceptible to the thiamin effect during the late winter months.

Histological study of brain sections and peripheral nerves is in progress in an attempt to discover a possible neurological cause of the symptoms and death.

Apparently this effect of large doses of thiamin upon scorbutic animals has not been observed previously.

15646

Hypoglycemic Action of Sulfanilamido-cyclopropylthiazole in Rabbits, and Its Reversal by Alloxan.

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Janbon and his co-workers¹ showed that in man sulfanilamido-isopropylthiadiazole caused a fall of blood sugar, to such an extent that hypoglycemic shock occurred. Loubatières,² working with the same compound in dogs, reported that hypoglycemia appeared when the product was given by mouth or by subcutaneous injection. In depancreatized dogs, however, no drop of blood sugar was observed in spite of increased dosage. The author thus concluded that this thiadiazole stimulated insulin secretion, and

that this action disappeared if the islets of Langerhans were absent. Bovet and Dubost,³ and Loubatières⁴ studied several analogues of sulfanilamido-isopropylthiadiazole, and found that the butyl, isobutyl, and amyl derivatives were more potent than the isopropyl.

Doctors L. P. Kyrides and F. B. Zienty, of Monsanto Chemical Co., St. Louis, Mo., generously supplied us with a compound closely related to the French product, and suggested an investigation of its effect on blood sugar

¹ Janbon, M., Lazerges, P., and Métropolitanski, J. H., *Montpellier Méd.*, 1942, **21-22**, 489.

² Loubatières, A., *C. R. Soc. de biol.*, 1944, **138**, 766.

³ Bovet, D., and Dubost, P., *C. R. Soc. de biol.*, 1944, **138**, 764.

⁴ Loubatières, A., *C. R. Soc. de biol.*, 1944, **138**, 830.