

Our results agreed with the findings of Small and Cafruny (2) that Ex 4877 does not block the diuretic response to furosemide.

Summary. Ex 4877 blocked the diuretic effects of SR 720-22, a quinazolinone, indicating a broader spectrum of blocking action for Ex 4877 and a similarity in the mode of action between hydrochlorothiazide and SR 720-22. The results support the findings by Small and Cafruny (2) that Ex 4877 does not block the diuretic effects of furosemide.

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The Effect of Glucola, Diet Cola and Water Ingestion on Blood Glucose and Plasma Insulin (33870)

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Kun and Horvath (1) investigated the effect of oral saccharin on carbohydrate metabolism and found that the ingestion of this substance caused a significant fall in blood glucose levels. They suggested that the sweet taste of saccharin stimulated the secretion of insulin via a reflex mechanism involving the sensory fibers from the taste end-plates and the vagus nerve. Emotional and neurogenic influences on blood sugar have been the subjects of repeated investigations (2, 3). Recent experiments indicate that electrical vagal stimulation provokes insulin secretion from the pancreas of anesthetized dogs (4, 5). These findings led us to investigate the effect of a noncaloric, sweet tasting substance on blood glucose and plasma insulin levels.

Methods. Four young healthy male adults who were neither diabetics nor first degree relatives of diabetics were studied. They were told before the experiment that at three sessions they would be given a nutritive liquid to drink and that blood samples would be drawn. After an overnight fast two blood

samples were taken. Each subject was then given, in separate studies, 10 oz of Glucola¹ (equivalent to 107 g of glucose), diet cola (a calorie-free similarly tasting cola drink containing 30 mg of saccharin), or water. They believed both cola drinks to be nutritive. Blood samples were drawn at: 5, 15, 30, 60, 90, and 120 min. Plasma immunoreactive insulin (IRI) was measured by a double antibody method (6) and blood glucose was measured on a Technicon Auto-Analyzer by the method of Hoffman (7).

Results. As shown in Fig. 1, when Glucola was given, plasma insulin levels rose to over 300% of fasting at 5 min and were greater than 500% at 30 min. With both the diet cola and water no significant rise in insulin levels was detected. Blood glucose levels rose to 163% of fasting at 30 min following Glucola, but remained essentially unchanged in the other studies.

Discussion and Conclusions. These results demonstrate that neither the sight nor the taste of a sweet diet cola preparation pro-

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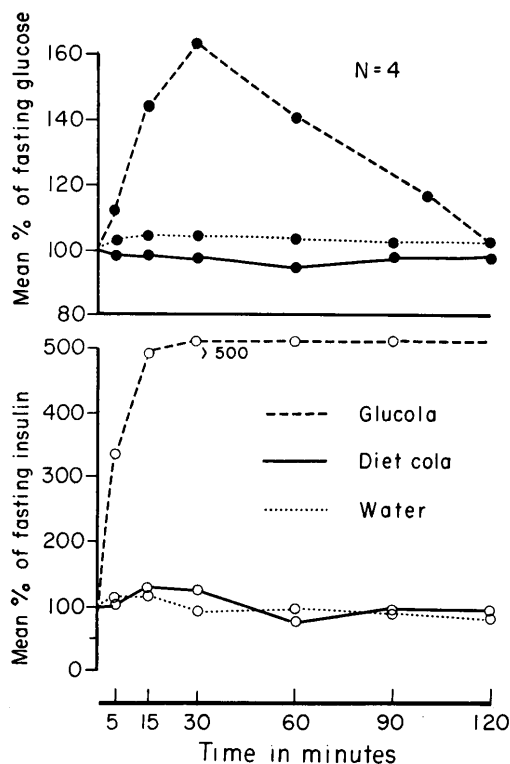


FIG. 1. Effect of Glucola, diet cola, and water on plasma insulin and blood sugar levels. The mean differences between diet cola and water are not significant.

voke a detectable fall in blood glucose or a rise in plasma insulin. Contrary to the report of Kun and Horvath this study does not support the theory of a reflex mechanism involving the taste end-plates in the mouth and the vagus nerve to lower blood glucose.

However, this does not rule out a role for the vagus nerve in the physiologic release of

insulin. It may well be that a neurogenic betacytotropic effect requires the stimulation by hyperglycemia of glucose receptors in the brain. Sakata *et al.* (8) demonstrated that intracarotid injections of glucose resulted in a lower blood sugar than intravenous injections of identical amounts of carbohydrate. These results are suggestive of a vagal mediated release of insulin in response to cerebral hyperglycemia.

Summary. A study was undertaken to investigate the effect of neurogenic influences on carbohydrate metabolism. Four normal subjects were given a cola flavored glucose preparation, a diet cola containing saccharin, and water. Only the glucose preparation produced significant changes in blood glucose and plasma insulin levels.

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