



EDITORIALS

HYPOGLYCEMIA IN CONGESTIVE HEART FAILURE

Episodes of disordered behavior, coma or convulsions are not infrequent during the course of severe, chronic, congestive heart failure. When observed, they are usually attributed to some process such as anoxemia, a cerebral vascular disturbance, drug intoxication, electrolyte imbalance, or some other alteration directly or indirectly related to the underlying cardiac disorder. The importance of the early recognition of the remediable causes of such occurrences is obvious, and hence the considerable therapeutic significance of the observation that they may occasionally be due to periods of hypoglycemia, readily reversed by the simple act of administering adequate glucose.^{1, 2}

Such episodes of hypoglycemia have been observed in a group of patients with chronic congestive heart failure due to a wide variety of causes including rheumatic fever, syphilis, coronary sclerosis and myxoma of the left atrium. The common feature of all of these patients has been congestive failure of very considerable degree and of prolonged duration.

It is not at all difficult to overlook hypoglycemia as the cause of such manifestations as sweating, palpitations, peculiar behavior, lack of responsiveness and convulsions in a patient who is seriously affected by congestive heart failure. The symptoms and signs of hypoglycemia are nonspecific and may be produced by a number of other conditions which are commonly part and parcel of advanced cardiac failure. It is not surprising, therefore, that hypoglycemia has often been overlooked as a cause of these manifestations and frequently recognized ultimately only by virtue of a chance laboratory determination. It is only through constant awareness that hypoglycemia may complicate the course of congestive heart failure and produce these varied alterations that one can apply the dramatic therapeutic as well as diagnostic maneuver of giving glucose to the patient which may be life saving. Before administering glucose it is, of course, helpful to obtain a blood speci-

men for later determination of the sugar content as a confirmatory test. It is sometimes necessary to give glucose for a prolonged period of time, and afterwards it is essential to make certain that the patient does not relapse into hypoglycemia, unrecognized.

While not demonstrated with finality, it has been postulated that these episodes of hypoglycemia are hepatic in origin, secondary to long-standing chronic passive congestion of the liver, as this has been a common feature of the patients described. Other possible causes of hypoglycemia,³ including disease of the pancreas, pituitary, adrenals or central nervous system, are thought to have been excluded by post-mortem as well as by clinical observation. It is, of course, possible that other factors may play a role in the production of this hypoglycemia of supposed hepatic origin, namely, anoxemia, failure to eat, and shock secondary to circulatory collapse. It is believed, however, that these could only be contributory factors. Even prolonged starvation does not lead to a significant degree of hypoglycemia. A state of acute or chronic anoxemia is thought to produce hyperglycemia and not hypoglycemia. Shock has never been noted to be accompanied by hypoglycemia.

In any event, it seems clear now that such nonspecific clinical manifestations as sweating, palpitations, disordered behavior, coma and convulsions complicating the course of severe, chronic, congestive heart failure, which frequently are explained away as being circulatory in origin, are occasionally actually due to hypoglycemia. The therapeutic implications of this fact are evident, and one should be alert to it.

REFERENCES

- ¹ Mellinkoff, S. M., and Tumulty, P. A.: Hepatic hypoglycemia. *New Eng. J. Med.* 247:745-50, 1952.
- ² Tumulty, P. A., and Mellinkoff, S. M.: The occurrence of hepatic hypoglycemia in congestive heart failure. *Tr. Am. Clin. & Climatol. A.* 64:75-83, 1952.
- ³ Conn, J. W.: Spontaneous hypoglycemia; importance of etiology in determining treatment. *J.A.M.A.* 115:1669-75, 1940.

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PENTOSE METABOLISM IN MAN

Within the past few years great interest has been demonstrated in the metabolism of five carbon sugars, both in plant and animal tissues. This interest stems from the realization that D-ribose and D-xylulose as phosphorylated esters are important intermediates in the