Alcohol Consumption

The sugar glucose is the main energy source for all tissues. Glucose is derived from three sources: from food; from synthesis (manufacture) in the body; and from the breakdown of glycogen, a form of glucose that the body stores in the liver. Hormones help to maintain a constant concentration of glucose in the blood. This is especially important for the brain because it cannot make or store glucose but depends on glucose supplied by the blood. Even brief periods of low glucose levels (hypoglycemia) can cause brain damage.

Two hormones that are secreted by the pancreas and that regulate blood glucose levels are insulin and glucagon. Insulin lowers the glucose concentration in the blood; glucagon raises it. Because prevention of hypoglycemia is vital for the body, several hormones from the adrenal glands and pituitary back up glucagon function.

Alcohol consumption interferes with all three glucose sources and with the actions of the regulatory hormones. Chronic heavy drinkers often have insufficient dietary intake of glucose. Without eating, glycogen stores are exhausted in a few hours. In addition, the body's glucose production is inhibited while alcohol is being metabolized. The combination of these effects can cause severe hypoglycemia 6 to 36 hours after a binge- drinking episode.

Even in well-nourished people, alcohol can disturb blood sugar levels. Acute alcohol consumption, especially in combination with sugar, augments insulin secretion and causes temporary hypoglycemia. In addition, studies in healthy subjects and insulin-dependent diabetics have shown that acute alcohol consumption can impair the hormonal response to hypoglycemia.

Chronic heavy drinking, in contrast, has been associated with excessive blood glucose levels (hyperglycemia). Chronic alcohol abuse can reduce the body's responsiveness to insulin and cause glucose intolerance in both healthy individuals and alcoholics with liver cirrhosis. In fact, 45 to 70 percent of patients with alcoholic liver disease are glucose intolerant or are frankly diabetic. In animals, chronic alcohol administration also increases secretion of glucagon and other hormones that raise blood g lucose levels.

Alcohol consumption can be especially harmful in people with a predisposition to hypoglycemia, such as patients who are being treated for diabetes. Alcohol can interfere with the management of diabetes in different ways. Acute as well as chronic alcohol consumption can alter the effectiveness of hypoglycemic medications. Treatment of diabetes by tight control of blood glucose levels is difficult in alcoholics, and both hypoglycemic and hyperglycemic episodes are common.