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THERAPEUTIC EVALUATION OF BARLEY- AN IDEAL FOOD IN DIABETES

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ABSTRACT

Barley contains approximately 10% dietary fiber. Hence it is used as fiber rich food particle. Since it is a water soluble fiber it can be made use in varieties of lipid disorders. A study showed unaffected serum lipids in normolipedemic subjects and significant fall in serum total cholesterol, LDL, VLDL and phospholipids. Hence plenty of scientific studies were conducted upon the mode of action of barley and it is found to be the best one as a diet in case of above said conditions.

KEYWORDS: Barley, Insulin Dependent, Glycemic Index, Nacin, Calcium, Zinc.

INTRODUCTION

In hyper-cholestremic conditions and conditions related to carbohydrate metabolism, in which food carbohydrates are digested into glucose and absorbed as such into the blood stream, this action stimulates the release of insulin from the pancreas into the blood, facilitating the entry of glucose into body cells. In diabetes, there is either an absence of insulin (type 1) or inefficient use of insulin (type 2) by the cells, causing glucose to build up in the blood, thereby creating serious complications if treatment is not provided. In the condition known as the metabolic syndrome, the body cells do not respond normally to insulin, resulting in elevated insulin as well as elevated glucose in the blood. This relative insulin resistance initiates further complications, such as abdominal obesity, hypertension, and elevated blood triglycerides. Carbohydrate foods differ in their rate of digestion and absorption into the blood, and these differences were the basis of establishing the glycemic index (GI) (Brand-Miller 1994). Food carbohydrates, especially starch, that have slower rates of digestion, are sometimes termed “lente” or slow digested and absorbed carbohydrates. In

general, foods with a high GI value are processed rapidly in the digestive tract, causing a steep high peak in blood glucose, and in normal individuals are followed by a corresponding rapid release of insulin. Low-GI foods, on the other hand, have slower absorption with a blunted, lower, and more prolonged glucose peak level. Investigation of the effect of barley on carbohydrate metabolism has intensified since Sato et al. (1990) reported that plasma glucose concentration in patients both with and without diabetes was lower after barley consumption than after rice consumption. Research studies on the glycaemic effects of barley have focused on one of two major aspects: (1) β-glucan as a viscous fiber, and (2) starch composition ratio of amylase to amylopectin. In many cases the glycaemic response to barley foods will be due to a combination of these two factors. Ikegami et al. (1991) in Japan measured glycemic responses in normal and diabetic rats fed a barley diet. All animals exhibited improved glucose tolerance, and fasting blood glucose in diabetic rats fed barley was reduced to normal levels. Similar results in diabetic rats were reported by Li et al. (2003a). Narain et al. (1992), from India, studied metabolic responses to barley in healthy human subjects. Chapatis made from barley flour were consumed in a quantity to provide 40% of the total daily cereal intake. After four weeks, the incremental area under the 3- hour glucose curve decreased from 107.9 mg/dL to 91.5 mg/dL. Battilana et al. (2001) investigated the mechanism of action of β-glucan in postprandial glucose metabolism in healthy men.

MATERIALS AND METHODS

The Indian barley seeds were collected and studied it pharmacologically to understand its various active principles and mode of actions.

RESULTS AND DISCUSSION

The following micronutrients present in barley may have the mode of action as follows.

Niacin: Niacin (nicotinamide) may help to preserve residual B-cell function in individuals with type 1 or type 2 Diabetes. This B-vitamin is believed to be one of the components of the glucose tolerance factor (GTF).

Vitamin E: Low levels of vitamin E are associated with increased incidences of diabetes. Research suggests that individuals with diabetes mellitus have decreased levels of antioxidants. Increased antioxidant requirements may be a result of increased free radical production during periods of hyperglycaemia.

Vitamin B6: Research shows that a deficiency of vitamin B6 may result in abnormal glucose tolerance, degeneration of the pancreatic beta cells, reduced insulin response to glucose and reduced serum and pancreatic insulin levels. In addition, vitamin B6 deficiency has been associated with polyneuropathies.

Calcium: Studies have shown that individuals with a low intake of calcium have an increased risk of non-insulin dependent diabetes mellitus. Numerous studies have also revealed that diabetes may be associated with abnormal regulation of intracellular calcium.

Zinc: This mineral has been associated with over 200 enzymatic functions in the body. Increased fasting blood glucose levels have been associated with low zinc. Zinc has been shown to be important in the synthesis, storage and secretion of insulin. Increased urinary zinc excretion has also been associated with diabetic individuals.

CONCLUSION

These researches concluded that the lowered glycemic response following a meal containing β-glucagon is related to delay and/or decreased absorption of glucose due to increased viscosity in the gut. Following these early studies on barley as an agent for modulation of blood glucose, together with recognition of the GI, there was heightened interest in the development of products containing barley, especially due to the growing incidence of diabetes.

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