

GLUCOSE TOLERANCE IN HEALTHY SUBJECTS:

EFFECT OF SACCHARIDE CHAIN LENGTH AND DIETARY FIBRE

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There is a view that there are "fast" and "slow" carbohydrates; refined sugar an example of the former and starch an example of the latter. This concept seems to have arisen in the 1920's as a result of work in pancreatectomized animals where both exocrine and endocrine pancreatic functions were lost. It has not been clear whether, in the presence of normal exocrine function and amylase secretion, these implied differences in glucose tolerance would actually occur. In six healthy male subjects, the relative absorption of saccharides of different chain length has been examined. Whether glucose is administered as a monosaccharide, a disaccharide (maltose), an intermediate polysaccharide mixture with a mean chain length of 5 glucose units (Caloreen^R), or a polysaccharide (starch), the rate of rise and fall in blood glucose concentration is similar in healthy subjects. Plasma insulin and plasma free fatty acid responses to glucose saccharide ingestion do not appear to be affected by chain length.

In a second group of seven healthy male subjects, the effect of dietary fibre on glucose tolerance was assessed. A conventional 50g glucose tolerance test was conducted with the ingestion of either standard diabetic jelly or the diabetic jelly with non-absorbable carbohydrate (N.A.C.). N.A.C. was bran, pectin, guar or pectin and guar. Each subject served as his own control. In the presence of pectin and guar combined, blood glucose was significantly less at 30 minutes and greater at 120 minutes. This suggests a slower and more prolonged absorption of glucose with the pectin and guar combination. Guar alone produced a significantly lower blood glucose concentration at 90 minutes. Bran did not significantly affect the peak blood glucose, but was associated with a significantly higher blood glucose than control at 120 minutes. Insulin response to a glucose load was not significantly affected by N.A.C. We suspect that the persistence of the "fast and slow carbohydrate" concept is attributable not to chain length differences, but to the effects of dietary accompaniments of carbohydrate on glucose tolerance.

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