Sri Lankan Traditional Rice Varieties: Their Ability on Controlling Postprandial Glycaemic Response

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Abstract- The current popularity of Sri Lankan traditional rice varieties stem from the many health benefits, specially the suitability for people with non communicable diseases (NCD) such as diabetes etc. Staples which produce lower glycaemic responses have been shown to be beneficial for people with NCD. However, scientific data on glycaemic response, glycaemic index (GI) of traditional rice is scarce and this study determined the glycaemic index and glycaemic load of traditional rice varieties *Kaluheenati, Masuran, Gonabaru, Kahawanu, Kahamala* and *Hetadawee*. Paddy was acquired from Rice Research Institute, Bathalegoda and authenticated traditional rice supplier and dehulled. Apparently healthy men and women with normal BMI (18.5-23), aged between 18-30 years (n=10) who volunteered were selected for the study and GI tested according to standard protocol. Values were presented as mean± standard error of the mean. Varieties *Kaluheenati* (60±5), *Masuran* (67±5), *Gonabaru* (63±7), *Kahawanu* (56±5) elicited medium GI while *Kahamala* (54±4) and *Hetadawee* (51±5) elicited low GI. Pericarp colour did not have an effect on GI as both red and white varieties elicited low or medium GI. Peak reductions against glucose for medium and low GI rice were 8.6% and 6.3% respectively. For each variety over 76% of volunteers exhibited either low or medium GI. Glycaemic load values for the given portion were high (26-33) but will be medium for an edible portion. The data scientifically confirms the suitability of consumption of these varieties for controlling the glycaemic response and related complications.

Key words: Glycaemic index, glycaemic load and Peak reduction

Introduction

Health concern among Sri Lankans has been increasing with increase prevalence of non-communicable diseases such as diabetes, cancer, etc. these diseases are the reasons for 83% of deaths in Sri Lanka. There is believe and evidence provided by folklores and indigenous medicine that traditional rice have many health benefits and good for several diseases conditions such as diabetes. Therefore consumption of traditional rice is the emerging trend among consumers. However, there is no favorable scientific approach on glycaemic responses of traditional rice varieties.

Objective

Therefore this study was designed to determine glycaemic index and glycaemic load of traditional rice varieties *Kaluheenati* (red)*, Masuran* (red)*, Gonabaru* (red)*, Kahawanu* (white), *Kahamala* (white) and *Hetadawee* (red). GI was introduced as a tool for dietary controlling of type 1 diabetes.

Methodology

Paddy was acquired from Rice Research Institute, Bathalegoda and authenticated traditional rice supplier and dehulled. Study was conducted according to WHO standard methods. Apparently healthy (n = 10, age 20-30 years) volunteers with BMI range of 18.5-23 kg/m^2 and not on any medical treatment were selected for the study. Subjects who volunteered were given a full summary of the study and informed that they should undergo a fast of 8-10 hours and refrain from undergoing vigorous exercise, alcohol consumption and high carbohydrate or high fat diet prior to the days of the study. Commencing of capillary blood drawing was done at the fasting state and then continued 30, 45, 60, 90, and 120 minutes after ingested the food. Blood serum was separated and analyzed under 500nm of visible range. Data is illustrated in a graph. Obtain the incremental area under the blood glucose response curve (IAUC) by ignoring area beneath the baseline. The calculation is done geometrically. The mean IAUC value of reference food is obtained. Finally the GI value is expressed as the mean IAUC obtained for the reference food by the same subject. Glycaemic load (GL) of the food is defined as the product of the amount of available CHO in a certain amount of food and it's GI, divided by 100

Results and discussion

Varieties *Kaluheenati* (60±5), *Masuran* (67±5), *Gonabaru* (63±7), *Kahawanu* (56±5) elicited medium GI while *Kahamala* (54±4) and *Hetadawee* (51±5) elicited low GI. Pericarp colour did not have an effect on GI as both red and white varieties elicited low or medium GI. Peak reductions against glucose for medium and low GI rice were 8.6% and 6.3% respectively. For each variety over 76% of volunteers exhibited either low or medium GI. Glycaemic load values for the given portion were high (26-33) but will be medium for an edible portion.

Conclusion

The data scientifically confirms the suitability of consumption of these varieties for controlling the glycaemic response and related complications

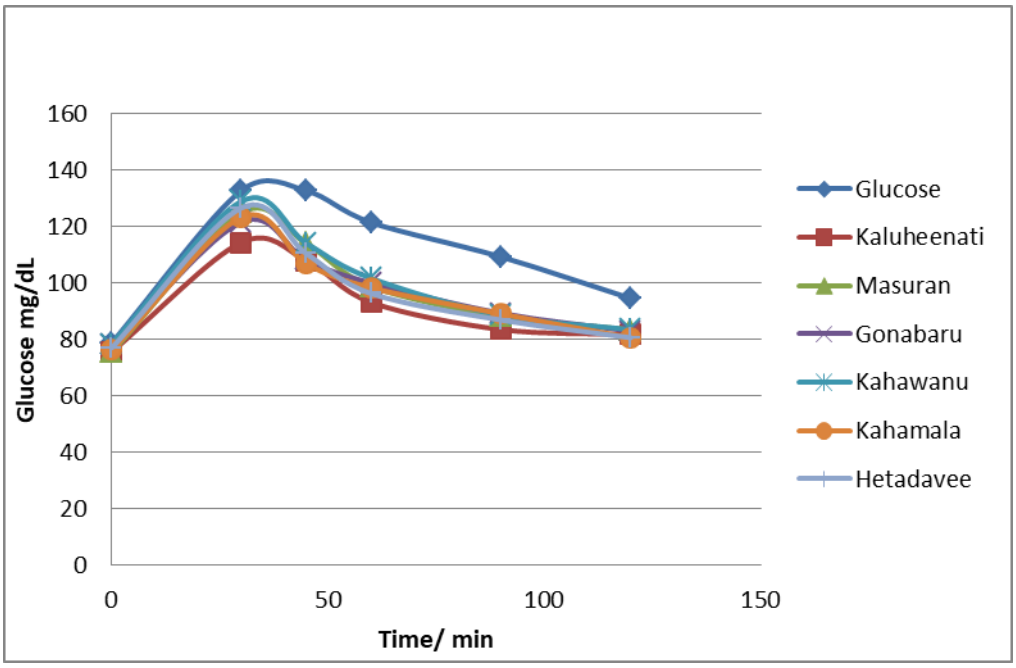

Figure 1 Glycaemic response curves of standard and test foods

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