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Effect of Inter and intra individual variations in determination of glycaemic indices

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Starchy foods differ in the ways by which they elicit blood glucose responses. Thus the concept of Glycaemic index (GI) was introduced to classify starchy foods depending on their rate of digestion and absorption. The GI of a food is measured by giving a standard food containing 50 g available carbohydrate and a test food containing the same amount of available carbohydrate on different days after an overnight fast. The standard food is given twice to the same individual to minimize day to day variations. The GI of foods is influenced by the properties of foods as well as physiological properties of the individuals participating in the study.

Thus the objectives were to analyze the effects of various parameters employed in GI determination on the interpretation of GI values. Following were analysed i) variation in fasting blood glucose values of individuals (n = 24) on the two days when standard was given ii) the effect of the fasting glucose values of the two days on Incremental area under curve (IAUC), iii) type of dinner meals and duration of fasting on IAUC, iv) variations of fasting blood glucose values of the same individual on different days when test foods were given; v) variations in postprandial glycaemic responses (at 2 hours following ingestion) for different foods in the same individual. The standard food (white sliced bread) was given on the first day of the study and mid way (5-6 weeks later).

The two groups of values of fasting glycaemic responses and the IAUC of the individuals when standard was given were found to be not significantly different ($p = 0.917$, and $p = 0.788$ respectively). The duration of fasting on the two days when the standard was given varied from 9-12 hours. One third (33%) of individuals had fasted for similar periods while 54% had 15-60 min differences on two days and rest of the individuals had 1.30 -2 hour differences. Most of the individuals (71%) had consumed rice and curry for dinner on both days, while the rest of the subjects had taken different dinner meals. When the coefficient of variation (CV) of fasting glucose responses of each individual on different days were analyzed a range of 1.8 – 12.3% were observed with 83% of individuals having a CV less than 10%. The CV of postprandial glycaemic responses (after 2 hours) varied from 2.2 – 16.2%.

Thus the different dinner meals and the duration of fasting (9-12 hours) have had no effect on the IAUC for the standard food. As the IAUC of the standard in each individual was employed to determine the GI value of the test foods the results of the present study confirms the reliability of the results.

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