

Original Research

NUTRITIONAL VALUE AND GLYCAEMIC INDEX OF KFC AND LOCAL BURGERS IN NORMAL AND DIABETIC HUMAN SUBJECTS

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ABSTRACT

Prevalence of diabetes mellitus has increased all over the world particularly in the developing countries including Pakistan. A study was designed to determine the nutritive value and glycaemic responses of 5 different test and control meals including chapatti + eggs and three varieties of KFC burger (Zinger, Chicken, Sub 60) and local burgers. To determine the nutritive value approximate analysis (CHO, Protein, fat, ash, fibre contents) of 6 different meals were done and to determine the glycaemic responses blood was taken by Finger Prick method and glycaemic responses were noted after 0, 30, 60, 90, 180, 120 minutes for diabetic volunteers on 0, 15, 30, 45, 60, 90, 120 minutes for normal volunteers. It was observed that all the five burgers included in the study possess high glycaemic indices. It is conceivable; therefore, that diabetic patients and obese individuals should not take all these burgers in their daily routine

Key words: Nutritive value, Glycaemic index, Burger, diabetes,

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INTRODUCTION

Diabetes mellitus has been described a metabolic disorder characterized by chronic hyperglycaemia due to relative insulin deficiency or resistance to insulin both. While the prevalence of diabetes mellitus has been increased all over the world particularly so in developing countries including Pakistan. No accurate figures for prevalence of diabetes in Pakistan are available even though there have been several small-scale studies conducted in different parts of the country. The prevalence figures for diabetes vary from 5.3% to 16.2% (Sammad, 1993).

In a study conducted to determine the population-based survey regarding the prevalence of diabetes mellitus and impaired glucose tolerance (IGT) and its relationship to age and obesity in

rural area of Shikarpur in Sindh province of Pakistan during 1994. They used WHO criteria for this study. Oral glucose tolerance tests were performed in a stratified random sample of 967 adults, (387 men, 580 women) between the age of twenty-five years and above. This showed the prevalence rate of diabetes 16.2% (9% known and 7.2% newly diagnosed) in men and 11.7% (6.3% known and 5.3% newly diagnosed) in women. The prevalence increased to almost 30% and 21% in 65-74 years old men and women respectively. IGT was detected in 8.2% of men and 14.3% of women. As such according to this study total glucose intolerance (diabetes and IGT combined) was present in 25% of the subjects examined (Jawaid and Jafary, 2003).

The glycaemic index (GI) express the rise of blood glucose eating a food against a standard blood glucose cure after glucose or (white bread) in the same subject. Most investigators have found that GI of a meal of mixed foods can be predicted from GI of its constituent foods (Jenkins *et al.* 1988).

Increased prevalence of diabetes and hypertension has been attributed to the newly acquired affluence by some lack of physical exercise and bad eating habits. With the fast food outlets becoming craze among the new generation, we might see a sharp increase after another 10 years. Moreover complications will be seen much more in our elderly population (youngster) in the days to come (Jawaid and Jafary, 2003).

Burgers has become very popular fast food among children as well as in adults. In today's life, world round us looks as it can not help anyone. But you can see burgers everywhere. As the demand for the burger is increasing. As well as diseases associated with it is also increasing including, obesity, diabetes or cardiac diseases. Present study was undertaken to determine the glycaemic index and nutritive value of burgers to overcome the diabetes disease or their responses towards diabetic and normal subjects.

MATERIALS AND METHODS

Chapatti + egg dish was prepared at home and three different varieties of burger that will be taken from KFC Faisalabad. Burger Varieties: 1) Zinger, 2) Chicken, 3) Sub-60 and local burger, were included in this study. Approximate analysis was done to determine the %age of CHO, protein, fat, fibre and total ash contents.

Determination of blood glucose responses of burgers

Groups of Six (6) normal and six (6), diabetic volunteers were selected randomly from Faisalabad city. The group of normal volunteers of both sexes between the age groups of 20-55 years were randomly selected the same way the diabetic volunteers will be selected. The blood glucose level of test subjects were determined by a glucometer taking capillary blood from diabetic volunteers at 0, 30, 60, 90, 120 and 180 minutes. Blood glucose levels of normal subject were determined at 0 hours (fasting), 15, 30, 45, 60, 90 and 120 minutes. Because the insulin and glucose responses in blood of normal volunteers are very quicker, the glycaemic indexes were determined by the following formula:

$$\text{Glycaemic index} = \frac{\text{Area under curve for test meals}}{\text{Area under the curve for carbohydrates (50g)}} \times 100$$

ANOVA (Analysis of Variance) will be applied by statistical analysis (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Glycaemic index of test burgers in diabetic subjects

The glycaemic indices (GI) of five varieties of burger were calculated by using 50 g available carbohydrates from chapatti and fried egg as standard and its GI was taken as 100. The GI values of test burger in diabetic subjects have been given in Table 1 which clearly show that Zinger Burger has a mean G.I value of 41.09 in diabetic subjects while the lowest and highest G.I. values were ranged from 9.50-74.80 respectively.

The mean G.I value of Col. Chicken Burger was 74.06 while its G.I values in diabetic is ranged from 35.00-101.8.

Glycaemic index (GI) of the test burgers in normal subjects

The glycaemic indices (GI) of the five varieties of burger were calculated taking 50 g available carbohydrate from Chapatti and egg as standard food taking its GI as 100. The glycaemic indices of different varieties of burger are given in table 1.

Table 1: Glycaemic indices of KFC and local burger in diabetic subjects

Subject	Chapatti + Egg	Zinger Burger	Col. Chicken Burger	Sub-60 Burger	Jamal Sweets Chicken Burger	Ideal Sweets Chicken Burger
Jawad	100.0	45.93	77.02	78.88	20.50	119.3
Rashid	100.0	9.50	35.00	26.00	21.00	107.0
Hassan	100.0	42.68	97.56	30.65	42.68	56.10
Shamim	100.0	64.68	101.86	6.12	28.62	64.31
Amina	100.0	74.80	70.08	42.13	126.4	92.91
Samina	100.0	8.93	62.86	23.05	68.57	128.57
Mean± SEM	100.0± 0.0	74.09± 11.18	74.06± 10.00	34.47± 10.09	51.29± 16.72	94.69± 12.00

Table 2: Glycaemic indices of KFC and local burger in normal subjects

Subject	Chapatti + Egg	Zinger Burger	Col. Chicken Burger	Sub-60 Burger	Jamal Sweets Chicken Burger	Ideal Sweets Chicken Burger
Kishwar	100.0	272.00	60.00	292.00	100.0	80.00
Shazia	100.0	42.11	33.33	15.79	59.65	56.14
Beenish	100.0	233.33	216.67	150.00	100.00	75.00
Adnan	100.0	262.50	37.50	225.00	356.25	250.00
Anwar	100.0	117.86	146.43	100.00	114.29	275.0
Qaiser	100.0	185.0	155.00	310.00	260.0	250.0
Mean± SEM	100.0± 0.0	185.47± 36.89	108.15± 30.74	182.13± 46.80	165.03± 47.51	164.36± 42.32

The mean GI value with Sub-60 Burger was 182.13 then GI value of Sub-60 Burger was ranged from 15.79±310.00; whereas GI value of Jamal Sweets Chicken Burger was ranged from 59.65±356.25. The Mean GI value of Jamal Sweets Chicken Burger was 165.03. GI value of Ideal Sweets Chicken Burger ranged from 56.14±275.00. The mean GI value of Ideal Chicken Burger was 164.36 (Table 2).

The glycaemic index (GI) is a classification of carbohydrate foods based on their acute blood glucose responses, it should not be used without also considering information about the chemical composition of foods (Jenkins *et al.* 1981). The GI has been recommended to help guide food choice (FAO, 1998) because high GI foods have been shown to improve blood glucose control in people with diabetes (Brand-Miller *et al.* 2003) to increase insulin sensitivity and β -cell function (Wolever and Mehling, 2002) and to reduce serum triacylglycerol (Jenkins *et al.* 1987). In addition low GI diet has been associated with reduced risk, for developing diabetes (Liu *et al.* 2000). GI may be used as a tool in planning diet for diabetic (Jenkin *et al.* 1998).

The glycaemic index of Zinger Burger was found to be 41.09 in diabetic and 185.47 in normal subjects. It has relatively higher amount of fat i.e. 25%. This high amount of fat might have delayed the gastric emptying and hence glucose and insulin responses (Welch *et al.* 1987).

Col. Chicken Burger has GI of 74.06 in diabetic and 108.15 in normal subjects. The GI value is high because burger consisting of bun or bread contain large amount of carbohydrates and lack of fibre. Sub-60 Burger has GI of 34.47 in diabetic while in normal it was 182.13. Sub-60 Burger was found to have the lowest GI than other burger varieties in diabetic subjects.

Jamal's sweet chicken burger has 51.29 in diabetic subjects and 65.03 in normal subjects, glycaemic index GI of Ideal's Sweet Chicken Burger was found to be 94.69 in diabetic while in normal subjects. It was found to be 164.36, Ideal Chicken Burger was found to be high GI value for diabetic.

All burger varieties included in the present study had high amount of fat ranged from 13.6-25%. This high amount of fat might have delayed the gastric emptying and hence glucose and insulin response. For the diabetic patients, it has already been reported that reducing the blood glucose raising potential of the diet by using low glycaemic index starchy foods. This has been found to be associated with improved blood glucose and lipid controls in patients with diabetes (Fontvielle *et al.*, 1992).

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