A COMPARATIVE STUDY BETWEEN THE IMPACT OF RAGI AND WHEAT ON BLOOD SUGAR LEVELS IN DIABETIC IN-PATIENTS IN BANGALORE BAPTIST HOSPITAL.

*Daphne Balan[1], Niangbiakmoi Khuptong[2], Ankita[3], Shilpa[4]

[1]CHIEF DIETICIAN, [2]SENIOR DIETICIAN, [3]RD STUDENT, [4]SENIOR DIETICIAN,
Department of Nutrition & Dietetics, Bangalore Baptist Hospital, Bangalore, Karnataka, India.
* Corresponding Email ID: daphnebalan19@gmail.com

INTRODUCTION

Diabetes mellitus (DM), commonly referred to as **diabetes**, is a group of metabolic disorders where there is high blood sugar levels over a prolonged period

Diabetes is due to either the pancreas not producing enough insulin or the cells of the body not responding properly to the insulin produced. Insulin is the principal hormone that regulates the uptake of glucose from the blood into most cells of the body, especially liver, adipose tissue and muscle, except smooth muscle, in which insulin acts via the IGF-1. Therefore, deficiency of insulin or the insensitivity of its receptors plays a central role in all forms of diabetes mellitus.

1) Types of diabetes

1.1. Type 1:

Type 1 diabetes mellitus is characterized by loss of the insulin-producing beta cells of the pancreatic islets, leading to insulin deficiency.

1.2. Type 2:

Type 2 DM is characterized by insulin resistance, which may be combined with relatively reduced insulin secretion. Type 2 DM is the most common type of diabetes mellitus.

1.3. Gestational diabetes

Gestational diabetes mellitus (GDM) resembles type 2 DM in several respects, involving a combination of relatively inadequate insulin secretion and responsiveness.

2) Causes of diabetes

Diabetes causes vary depending on your genetic makeup, family history, ethnicity, health and environmental factors.

- Viral or bacterial infection

- Chemical toxins within food
- Unidentified component causing autoimmune reaction

Underlying genetic disposition may also be a type 1 diabetes cause.

- Obesity
- Living a sedentary lifestyle
- Increasing age
- Poor dietary intake
- Family history of gestational diabetes
- Overweight or obese
- Suffer from polycystic ovary syndrome
- Have had a large baby weighing over 9 lbs
- Glucagonoma - Patients with glucagonoma may experience diabetes because of a lack of equilibrium between levels of insulin production and glucagon production.
- Steroid induced diabetes (steroid diabetes) - It is a rare form of diabetes that occurs due to prolonged use of glucocorticoid therapy.

3)

Intake of dietary fat particularly saturated fat has proved clear association with insulin resistance in animals (Storlien et.al 1996)[1] and human subjects (Marshall Et.al 1997)[2] and can even lead to onset of Diabetes mellitus (Marshall Et.al 1994)[3]. On the other hand the effect of carbohydrate on insulin sensitivity is not so strongly shown in any article. The source of dietary sugars like sucrose and fructose may be important when considering the impact of intake on human health. According to WHO/FAO recommendations, a high carbohydrate diet with low GI starchy foods is suggested.

OBJECTIVES OF THE STUDY

✓ To find out the impact of ragi consumption on the blood glucose level of a diabetic patient.

✓ To find out the impact of Wheat dosa consumption on the blood glucose level of a diabetic patient.

✓ To find out the impact of Chapatti consumption on the blood glucose level of a diabetic patient.

✓ To compare the impacts of Ragi, Wheat dosa, Chapatti on the random blood glucose level, pre and post lunch.

The people in the state of Karnataka mainly consume rice or ragi (finger millet) as a staple. Diabetic patients are often advised to restrict the intake of rice and increase the intake of wheat and ragi products.

This study was done to assess the difference in effect of ragi and wheat in blood sugar levels of diabetics

METHODOLOGY

A. Selection of area:

To conduct the survey Bangalore Baptist

Hospital was selected for collection of data from the inpatients of the hospital

B. Selection of subject:

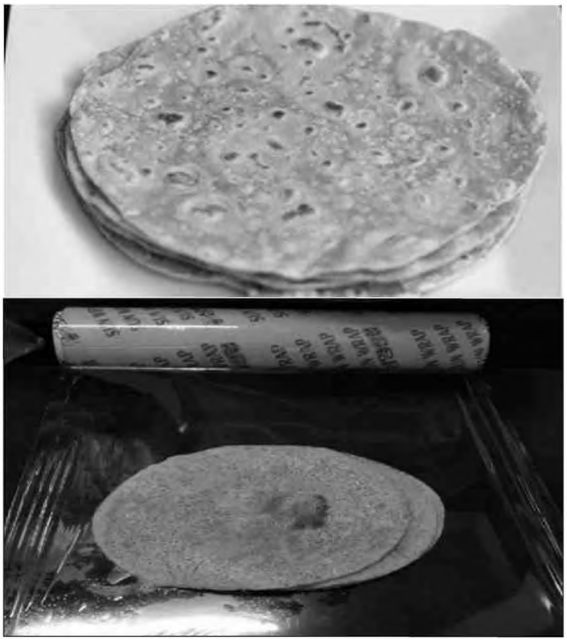
The descriptive-comparative study comprises 45 patients, belonging to the age group of above 40 years of age.

The inclusion criteria are:

✓ The diabetic patients who were admitted in the hospital as inpatients.

✓ The diabetic patients who were fed on Ragi ball, Wheat dosa and Chapatti.





The exclusion criteria are:

- The diabetic patients who came for treatment in the hospital as outpatients.
- The diabetic patients who were fed only on rice, broken wheat items.
- The Type I diabetic patients.

A. Collection of Data and conduct of survey:

C.1. Source of data: Data was collected from several inpatients that were diagnosed with Type II Diabetes Mellitus and were in the middle aged group or elderly.

C.2. Type of tool : Blood glucose level was monitored pre and post lunch, so as to find out the difference or rise/fall in glucose level. The pre-lunch glucose level was tested at around 10-11 am in the morning and the lunch was provided at 1.30 pm. The post lunch glucose level was tested at around 2.30-

3.00 pm and both readings were recorded for each patient.

RESULTS AND DISCUSSION

In this study, a total of 45 people above 40 years of age were tested for the blood glucose level before and after meal. They were tested for their blood glucose before and after their meal.

Table: 1 Glucose level in mg/dL before and after intake of chapatti:

No. of patients	before food	after food
1	270	240
2	185	215
3	127	189
4	168	177
5	173	190
6	340	326
7	260	291
8	110	119
9	278	298
10	173	186
11	95	186
12	262	202
13	305	215
14	361	311
15	384	212

Table 1 shows the data for blood glucose level (mg/dl) before and after meals for group which were served with chapatti during the lunch. Graph was plotted which has been depicted in the figure given below

.Graphical representation of blood glucose levels before and after consuming chapatti:

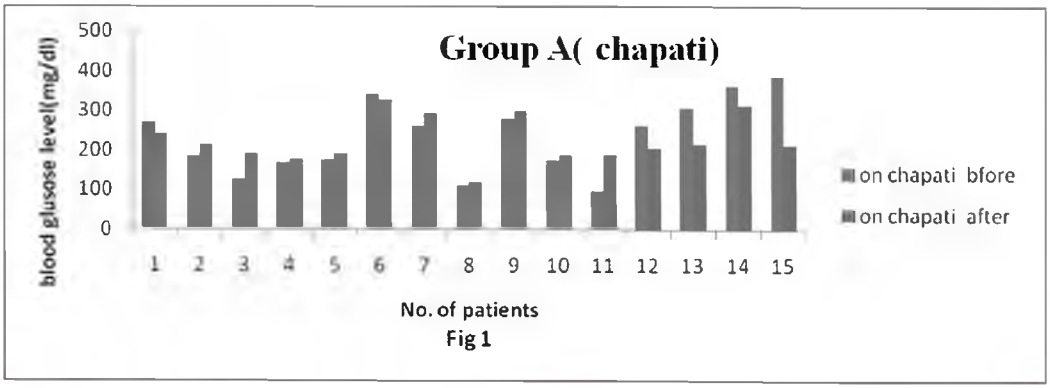


Fig 1

Figure 1 shows that on intake of chapatti blood glucose level decreased for 6 patients in this group. Chapatti has moderate glycemic index and more of fibers so it is a better alternative for diabetic patients to maintain their blood glucose level. It is absorbed more slowly and does not cause surge in glucose blood levels.

Table: 2 Blood glucose in mg/dL before and after wheat dosa:

No. of patients	before	after
1	360	254
2	296	290
3	144	156
4	264	269
5	164	198
6	203	208
7	114	145
8	155	138
9	199	179
10	135	204
11	139	169
12	486	388
13	131	184
14	281	337
15	241	256

Table 2 shows blood glucose level before and after intake of wheat dosa. Graph was plotted which has been depicted in the figure given below:

Graphical representation of blood glucose levels before and after consuming wheat dosa:

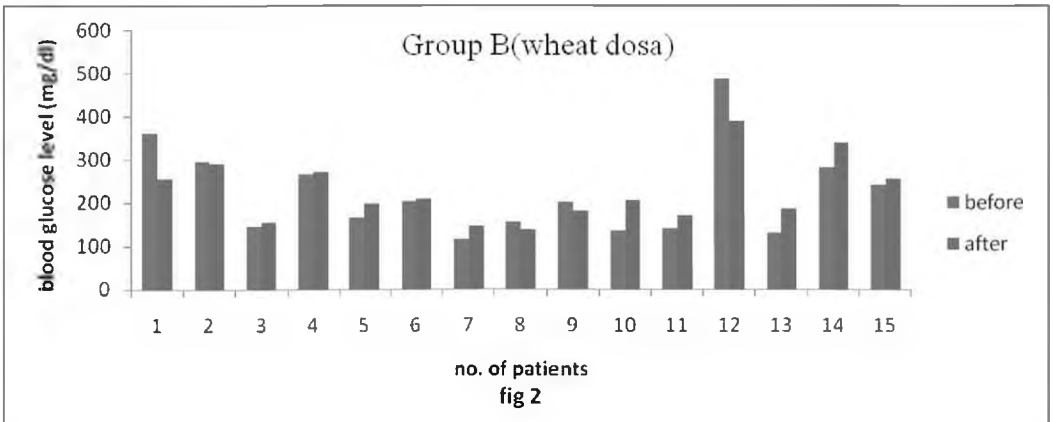


fig 2

Figure 2 shows that on intake of wheat dosa, blood glucose level did not decrease for majority of patients in this group, except for 5 of them who showed decrease in the blood glucose level.

Table: 3 Blood glucose in mg/dL before and after intake of ragi ball:

No. of patients	Before meal	after meal
1	114	145
2	123	146
3	153	154
4	292	319
5	242	141
6	200	219
7	99	152
8	129	209
9	281	289
10	298	420
11	400	418
12	300	362
13	135	109
14	422	450
15	298	351

Table 3 shows blood glucose level before and after intake of ragi ball. According to the data obtained a graph was plotted which has been depicted in the figure given below:

Graphical representation of blood glucose levels before and after consuming ragi ball:

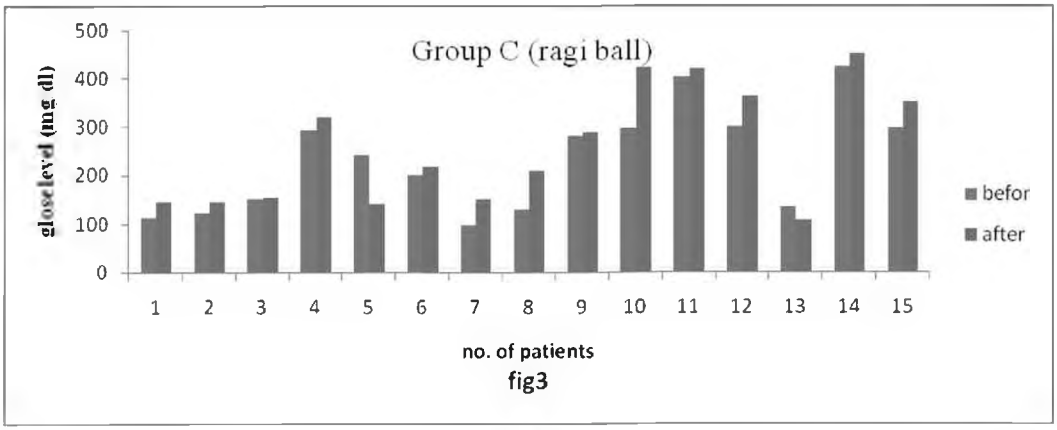


fig3

In the figure given above it shows that on intake of Ragi ball blood glucose level increase for maximum no. of patients in this group and only 2 patients shows decreased level.

SUMMARY AND CONCLUSION

In this study subjects with diabetes were put on a diet of chapatti, wheat dosa and ragi ball and their blood glucose levels were tested. A total of 45 patients from middle aged group, both male and female were included in this study and then were divided into three groups based on the diet they were given.Group A was served with chapatti, Group B with wheat dosa and Group C with ragi ball. The glucose level was measured four to five hours before intake of lunch and was recorded and the same was done 1 hour post lunch. It was found that

- With the intake of ragi ball, rapid upsurge in glucose was seen in patients of group C (13 patients out of 15) when compared to patients in group B which were given a diet of wheat dosa (10 patients out of 15 showed increase in glucose level).
- In group A, a decrease in glucose level on intake of chapatti (9 patients out of 15 increase exhibited in glucose level) was observed. Chapatti being a product of wheat flour is moderate in glycemic index, hence moderately low level of glucose is released in the blood, while ragi has a high glycemic index of over 150 which makes it highly undesirable for diabetic patients.

Thus it can be concluded that to control blood glucose level in diabetic patients they should be served with low GI foods such as bulgur, milk and milk products, quinoa etc. besides this there should be inclusion of physical activity in daily routine of an individual. This will maintain the health of the individual in the long run.

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