



## SERUM POST PRANDIAL GLUCOSE LEVEL LESS THAN FASTING GLUCOSE!?

**SREEKANTHA**

*Sreekantha-Associate professor, Department of Biochemistry, Navodaya Medical College Raichur, Karnataka, India.*

### ABSTRACT

Blood glucose estimation is the most common investigation in the medical practice in all disciplines. Altered values of blood glucose are very common in laboratory but here we are reporting the fasting blood glucose (FBG) more than the post prandial blood glucose (PPBG). This type of results are confusing for the consultants to make relevant diagnosis and treatment. Blood glucose estimation was done using Glucose oxidase method and tabulated the reports of 24 subjects with FBG more than PPBG in the period of 3 months along with estimation of Glyco-Hb for mean comparison in semi auto analyzer A-15. Here we are trying to explain the various factors which may contribute to the development of FBG more than the PPBG, methodology of evaluation of these subjects.

**KEY WORDS:** FBG, PPBG, etiology.



**SREEKANTHA**

Sreekantha-Associate professor, Department of Biochemistry, Navodaya Medical College Raichur, Karnataka, India.

*\*Corresponding author*

## INTRODUCTION

Organisms obtain energy by the oxidation of complex organic components; they are carbohydrates lipids and proteins. Although all the three are used as a source of energy, Carbohydrates are the primary source of energy for most of the tissues in humans ( 1 ). Glucose is the preferred source of energy for most of the body tissues. Brain, central Nervous system, RBCs, testes and kidney medulla are dependent exclusively on glucose for the continuous supply of energy. Human brain requires 2/3 of total glucose needed by the entire body and glucose is the only source that supplies energy to the skeletal muscle under an aerobic conditions. Normal fasting plasma glucose(FBG) is 70-110mg/dl, after carbohydrate meal or heavy carbohydrate breakfast is given to a normal person the blood glucose which is measured after two hours is called post prandial blood glucose(PPBC); which is less than 140-160mg/dl ( 1,2 ). Blood glucose estimation is the most common investigation performed for all out patient or inpatient departments and routine health checkup. Sometimes fasting blood glucose (FBG) report shows more value when compared to post prandial blood glucose (PPBG). This type of report of blood glucose value is an error .Hence the present report aims at causative factors and

biochemical explanation for FBG value more than the PPBG.

## MATERIALS AND METHODS

The subjects chosen were from suspected patients of Diabetes Mellites (DM) attending outpatients department or LIC checkup or routine health checkup of medical college teaching hospital. Chosen patients were not suffering from any multisystemic disorders or chronic inflammatory diseases or not on any drugs like steroids, antidepressants, immunosuppressants, antimetabolites etc; which interfere with blood glucose homeostasis. For FBG estimation, the subject should be in fasting (10-12 hrs after regular carbohydrate diet) and for PPBG, the subject should consume meal or heavy carbohydrate breakfast and the sample is drawn after 2 hours of the same and reported as PPBG. 5ml blood sample is drawn from median cubital vein or basilic vein under strict aseptic precautions, and is subjected to glucose estimation in A-15 semi auto analyser. In the same sample blood, Glyco-Hb was measured and expressed as percentage from the same instrument. The subjects were well informed about the investigations and oral consent was taken and explained the whole procedure in their local language.

## RESULTS AND TABULATION

The table showing the FBS, PPBS and Glyco-Hb(HBA<sub>1</sub>C) of 24 subjects

Sl.No	Age(Years)	Sex	FBS(mg/dl)	PPBS(mg/dl)	Glyco-Hb(%)
1	42	Male	108	77	5.6
2	43	Male	101	90	5.3
3	51	Male	95	86	4.9
4	54	Female	90	79	5.5
5	47	Male	98	87	5.1
6	53	Female	91	79	4.9
7	53	Male	100	89	4.8
8	48	Female	103	91	5.2
9	46	Male	106	90	5.1
10	54	Female	96	89	5.2
11	45	Male	89	78	4.0
12	52	Female	105	93	4.9
13	37	Male	82	87	4.2
14	46	Male	98	91	4.0
15	53	Female	80	72	3.9
16	49	Male	104	97	4.5
17	56	Male	89	84	4.8
18	47	Female	97	90	5.6
19	56	Male	93	87	5.1
20	48	Female	100	93	4.7
21	55	Male	80	78	5.3
22	49	Female	84	89	5.0
23	50	Male	82	87	5.7
24	55	Male	98	90	6.0

*There were 15 males and 9 females in tabulated group; in both the groups of subjects, there were no clinically evident signs and symptoms of hypoglycemic episodes. From the above data it was observed that FBG value is greater than PPBG and Glyco-Hb levels were within normal limits.*

## DISCUSSION

The present study accounts the FBG is more than the PPBG. In routine laboratory results, FBG is almost less than the PPBG; reason being the ingested carbohydrates polymers is converted to glucose monomer, they are absorbed by the gut and transported to the liver by hepatic venous blood supply. Glucose is the only carbohydrate to be directly used for the energy or stored as glycogen. Galactose

and fructose must be converted to glucose before they can be utilized. After glucose enters the cell, it is quickly shunted into different metabolic pathways depending on availability of substrates or energy status of the cell. This is the overall fate of glucose after ingestion of carbohydrates (1,2,3,4). In the routine set up in the laboratory, FBG is always less than the PPBG, the reason being

explained above; but sometimes in  $\leq 4$  to 5 % of cases FBG is more than the PPBG (as 95<sup>th</sup> percentile). But FBG more than the PPBG is of interesting medical importance to evaluate the proper history, drug treatment and mode of food item ingested after the measurement of FBG. The reason for PPBG less than the FBG is explained by the following reasons. The first reason being, it may happen in normal individuals also. Then the test has to be repeated and values are to be confirmed again. (if the values are persistently similar in three repeated tests; then QC is checked and reported as same) (5, 6, 7). Secondly, the proper diet history of the patient was taken and the patient was not have consumed any of the carbohydrate rich diet in the last three days and on the test day, when carbohydrate load is given (after FBG); which results in stimulation of insulin secretion, which brings hypoglycemia called 'Reactive hypoglycemia' (4,5,10). Thirdly, the subject might not be consumed enough carbohydrate containing food due to afraid of getting higher values. Fourthly, the subject

might be consumed protein and fiber rich diet; which interfere with less PPBG value (3,4,9). Fifthly, the subject may be suffering from any other hormonal imbalance or any endocrinopathies which interfere with absorption of glucose like hypothyroidism (6,8,11). Lastly, any disease that interfere with absorption of glucose in gastro intestinal tract disorders like complete gastrectomy, partial gastrectomy, malabsorption syndrome, Intestinal spure, Hirsutism's disease, Crohn's disease, blind loop syndrome etc (5) are to be evaluated in detail.

## CONCLUSION

There are several factors (endocrinal, metabolic, habitual & other systemic disorders) which contribute for FBG value greater than the PPBG. Therefore, whenever FBG values are higher than the PPBG, above mentioned factors are properly evaluated and concluded.

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