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Research Article

THE STUDY OF CORRELATION BETWEEN FBS AND PPBS IN DIABETES MELLITUS AND NON-DIABETES MELLITUS COMMUNITY OF AJMER, RAJASTHAN

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ABSTRACT

Diabetes is one of the major causes of premature illness and death worldwide. Non communicating diseases including diabetes account for 60% of all deaths worldwide. In most of cases, this disorder is detected by presence of increase level of sugar in blood & urine. The present study has been conducted in the Department of physiology and medicine in a group of 50 subjects with carried out on 25 patients suffering from diabetes mellitus and 25 healthy controls. Blood glucose levels were consistently very high in diabetics than in non-diabetics. The differences were statistically significant among both sexes and that too for the parameters of FBS (fasting blood sugar) and PPBS (Post prandial blood sugar). In our study, A statistically significant difference was detected in FBS and PPBS levels between diabetes mellitus and non-diabetes mellitus without complication ($p<0.001$) and diabetes mellitus and non-diabetes mellitus with complication group ($p<0.001$). Also statistically significant increases in FBS and PPBS levels were observed in diabetes mellitus.

Keywords: *Diabetes Mellitus, FBS (Fasting Blood Sugar), PPBS (Post Prandial Blood Sugar)*

INTRODUCTION

Diabetes is one of the major causes of premature illness and death worldwide. Non communicating diseases including diabetes account for 60% of all deaths worldwide. In most of cases, this disorder is detected by presence of increase level of sugar in blood & urine. Diabetes, is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period (Diabetes Blue Circle Symbol, 2006). Per the World Health Organization people with fasting glucose levels from 6.1 to 6.9 mmol/l (110 to 125 mg/dl) are considered to have impaired fasting glucose (WHO, 2006). People with plasma glucose at or above 7.8 mmol/l (140 mg/dl), but not over 11.1 mmol/l (200 mg/dl), two hours after a 75 g oral glucose load are considered to have impaired glucose tolerance. Diabetes mellitus is also occasionally known as "sugar diabetes" to differentiate it from diabetes insipidus (Parker, 2008).

Diabetes mellitus causes early maturation, abnormal cross linkages and stiffening of the collagen and elastic fibers of connective tissues all over body.

Uncontrolled diabetes mellitus with elevated blood glucose levels for Long period causes increased and rapid non-enzymatic glycation of the collagen and elastic fibers and this process also affect the lungs and central tendon of diaphragm (Kohn *et al.*, 1982).

During the recent past several studies on lung functions in diabetic subjects have been published in which some of the investigators have found reduced Forced vital capacity (FVC), Forced expiratory volume in one second (FEV1) and other pulmonary functions amongst diabetic subjects compared to normal controls (Lange *et al.*, 1988; Anasuma *et al.*, 1985; Schnapf *et al.*, 1984). Other investigators have been unable to demonstrate any changes in lung functions in diabetic subjects (Schuyler *et al.*, 1976; Schernthener *et al.*, 1977; Sandler *et al.*, 1990).

Practically system is affected by complication of Diabetes mellitus. Attention is usually paid to angiopathy (micro, macro), retinopathy and neuropathy but one of the system most neglected in Diabetes

mellitus is the Respiratory System, except for the recognition of increased in infection prevalence like tuberculosis.

MATERIALS AND METHODS

The study was conducted in patient suffering from diabetes mellitus, patient attending outdoor of MEDICINE Department J.L.N Hospital, Ajmer. The present study was carried out on 25 patients suffering from diabetes mellitus and 25 healthy control.

They are divided into following groups:

Group A → Comprised of 25 healthy subjects of age group40 to 60 yrs.

Group B → Comprised of 25 subjects of age group 40 to 60 yrs suffering from diabetes attending the medical outdoor

Capillary blood glucose measurements of all participants were done in the fasting state (at least eight hours of fasting) as well as in the postprandial state, two hours after lunch, the same day. Acceptable control level of blood glucose were defined as FBS value equal or less than 120 mg/dL and PPBS value equal or less than 160 mg/dL. Isolated postprandial hyperglycemia was defined as FBS equal or less than 120 mg/dL with PPBS equal or more than 160 mg/dL.

Inclusion criteria:-Patient with diabetes mellitus at least 6 month duration, able to give informed consent.

Exclusion criteria: Excluded from the study are subjects with any other systemic diseases, smokers, pregnant women, subjects with alcohol intake, subjects treated with radiotherapy of head and neck region and subjects on steroid therapy.

Statistical Analysis

All value are presented as mean + SD. Comparison of mean value of parameter of Diabetic and control subjects was done by using student's t test.

RESULTS AND DISCUSSION

Results

FBS and PPBS in diabetic mellitus study done in a total number of 50 cases were suitable for analysis.

Table 1: Blood glucose level in study group (Diabetes mellitus)

Gender		N	Minimum	Maximum	Mean	S.D.
Male	**FBS**	13	103	260	186.54	38.42
	PPBS	13	160	382	272	57.96
Female	**FBS**	12	109	210	171.52	31.80
	PPBS	12	210	341	274.41	48.46

Overall, the level of control of diabetes among the subjects appeared to be poor. The mean fasting blood glucose (FBS) among males was 186.54 (S.D. 38.42, range 103-260) and among females 171.52 (S.D. 31.80, range 109-210).

The mean 2 hr postprandial blood glucose (PPBS) among males was 272 (S.D. 59.96, range 160-382) and among females 274.41 (S.D. 48.46, range 210-341).

Table 2: Blood glucose level in control group (Non-Diabetes mellitus)

Gender		N	Minimum	Maximum	Mean	S.D.
Male	**FBS**	11	70	100	86	10.91
	PPBS	11	110	130	120.72	6.65
Female	**FBS**	14	69	102	89.64	10.64
	PPBS	14	104	148	121.21	12.55

Overall, the level of control of diabetes among the subjects appeared to be poor. The mean fasting blood glucose (FBS) among males was 86 (S.D. 10.91, range 70-100) and among females 89.64 (S.D.10.64, range 69-102). The mean 2 hr postprandial blood glucose (PPBS) among males was 120.72 (S.D. 6.66, range 110-130) and among females 121.21 (S.D. 12.55, range 104-148).

Table 3: Correlation between FBS and PPBS in diabetes mellitus and non-diabetes mellitus

Males	**Diabetic (n=13) Mean +SD)**	**Non-diabetic (n=11) Mean+ SD**	**T value**	**P value**
FBS	186.54+**38.42**	86+**10.91**	9.01	<.01(VS)
PPBS	272+**57.96**	120.72+**6.65**	9.33	<.01(VS)
Females	Diabetic (n=12) Mean (SD)	Non-diabetic (n=14) Mean (SD)	T value	P value
FBS	171.52+**31.80**	89.64+**10.64**	8.52	<.001(HS)
PPBS	274.41+**48.46**	121.21+12.55	10.65	<.05(S)

Blood glucose levels were consistently very high in diabetics than in non-diabetics. The differences were statistically significant among both sexes and that too for the parameters of FBS (fasting blood sugar) and PPBS (Post prandial blood sugar).

HS: Highly significant
VS: Very significant
S: Significant

Discussion

This study was undertaken to assess the blood glucose levels of diabetes mellitus patient, and to compare it with those of non-diabetic healthy subjects. Few studies have focused on relationship between pulmonary function and diabetes. Most such studies have been conducted on subjects with type 1 diabetes mellitus.

In this study there were a larger number of females than males (58%vs 42%). This is consistent with the findings of Ho *et al.,* (1998) who reported the occurrence of diabetes mellitus more in males (0.95%) than in females (0.20%).

The present study measured the blood glucose level in diabetes mellitus. The blood glucose threshold of 25 studies exposed to FBS and PPBS were measured and compared with a control group.

The different groups i.e. male and females, diabetes mellitus and non-diabetes mellitus comparable in terms of age, height and weight.

In the present study, the mean FBS levels in diabetes without complications and diabetes with complications were 186.54+38.42 and 86+10.91 when compared to controls. These differences were statistically significant ($p<0.001$) and consistent with the reports given by Verma *et al.,* (2010) and Akinloye *et al.,* (2011). The PPBS levels in the study groups were significantly high when compared to control. This findings is consistent with the finding of Fahmy *et al.,*(2013).

In our study, we found increases blood glucose sugar in diabetes mellitus. Blood glucose sugar level was consistently lower in normal than in diabetes mellitus. The differences were statistically significant among both sexes and that too for the parameters of FBS and PPBS.

Conclusion

The FBS and PPBS correlation analysis in the present study could not establish a consistent parameters relationship in the entire study group. A statistically significant was detected in FBS and PPBS levels between diabetes mellitus and non-diabetes mellitus without complication ($p<0.001$) and diabetes and non-diabetes with complication group ($p<0.001$). Also statistically significant increases in FBS and PPBS levels were observed in the diabetes with complication when compared to those without the complication group ($p<0.001$).

However, there are many issues that need consideration and further exploration, which recommends extensive and highly structured research before we reach to any conclusion.

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Conflict of Interest
No potential conflict of interest relevant to this article was reported.

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