

RESULTS

Table No. 1 : Sex Distribution for diabetic and non diabetic

Sex Distribution	Diabetic		Non-diabetic	
	No. of Patients	%	No. of Patients	%
Male	110	55	90	45.5
Female	90	45	101	50.5
Total	200	100	200	100

The above table shows that among the diabetic individuals 55%(110) were males and 45%(90) were females. Among the non diabetic individuals 49.5% (99) were males and 50.5% (101) were females.

Table No. 2 : Age Distribution for diabetic and non diabetic

Age (Yrs)	Diabetic		Non diabetic	
	No. of Patients	%	No. of Patients	%
20-40	12	6	28	14
41-60	134	67	137	68.5
61-80	53	26.5	33	16.5
> 81	1	0.5	2	1
Total	200	100	200	100

The above table shows that the age range of all diabetic and non diabetic individuals was 20-81 years. Among the diabetic patients 67% (134) of patients were in the age range 41-60 followed by 26.5%(53) between 61-80,6% (12) between 20-40 years and among the non diabetic group of individuals 68.5% (137)of them were between 41-60 years, 16.5% (33) between 6-80 years, 14% (28) of them between 20-40 years ,1% (2) of them were above 81 years. In both the groups maximum of them belonged to 41-60 years of age.

Table No. 3 : Fasting Blood sugar level for diabetic patients

FBS (mg/dl)	No. of Patients	Percentage (%)
70-200	167	83.5
201-400	27	13.5
401-600	6	3
Total	200	100

The above table shows that fasting blood sugar levels in diabetics ranged between 70-600 mg/dl. 83.5% (167) of these patients had their fasting blood sugar levels between 70-200. 13.5 % (27) between 20-400, 3%(6) between 40-600.

Table 4 shows Fasting salivary levels in diabetic patients

Fasting Saliva (mg/dl)	No. of Patients	Percentage (%)
0 – 10	172	86
10.1 – 20	20	10
20.1 - 31	8	4
Total	200	100

The salivary glucose level in diabetic patients ranged between 0-31 mg/dl. Maximum patients i.e. 86% (172) had their levels between 0-10, followed by 10% (20) between 10.1-20 mg/dl and 4%(8) between 20.1 - 31 mg/dl

Table No. 5 : Distribution of patients who received medication for diabetes

Medication received	No. of Patients	Percentage (%)
Yes	136	68
No.	64	32
Total	200	100

The above table shows that 68% (136) of them were on medication and 32% (64) were unaware of disease status.

Table No. 6 : Fasting Blood sugar level for Non-diabetic patients

FBS (mg/dl)	No. of Patients	Percentage (%)
60 – 80	16	8
81 – 100	103	51.5
101 – 135	81	40.5
Total	200	100

The above table shows that it ranged between 60-135 mg/dl. 51.5% (103) of them between 81-100 mg/dl followed by 40.5% (81) between 01-135 mg/dl and 8%(16) between 60-80 mg/dl.

Table No. 7 : Fasting Saliva level for Non-diabetic patients

FBS (mg/dl)	No. of Patients	Percentage (%)
0 – 4	176	88
4.1 – 8	19	9.5
8.1 – 14	05	2.5
Total	200	100

The above table shows that it ranged between 0-4 mg/dl.88% (176)of the individuals had their salivary levels between 0-4%, 9.5% (19)between 4.-8mg/dl and 2.5%(5) between 8.1-14 mg/dl

Table No. 8 : Post Prandial Serum glucose levels for diabetic patients

PPBS (mg/dl)	No. of Patients	Percentage (%)
90 – 200	53	26.5
201 – 400	146	73
401 – 600	01	0.5
Total	200	100

The above table shows that it ranged between 90-600 mg/dl. Maximum i.e. 73% (146) between 201-400, 26.5%(53) between 90-200 and 0.5%(1) had their levels between 401-600 mg/dl.

Table No. 9 : Post Prandial Salivary Glucose Levels (PPSGL) in diabetic patients

PPSGL (mg/dl)	No. of Patients	Percentage (%)
0 – 10	161	80.5
10.1 – 20	28	14
20.1 – 40	11	5.5
Total	200	100

The above table shows that it ranged between 0-40 mg/dl. 80.5%(161) had their salivary glucose levels between 0-10, 14%(28) between 10.1-20 and 5.5%(11) between 20.1-40 mg/dl.

Table No. 10 : Post Prandial Serum Glucose Levels (PPSGL) for Non- diabetic individuals

PPSGL (mg/dl)	No. of Patients	Percentage (%)
80 – 140	113	56.5
141 – 200	71	35.5
201 – 250	16	8
Total	200	100

The above table shows that 56.5%(113) of patients had postprandial serum glucose levels between 80-140 mg/dl, 35.5%(71) of patients between 41-200mg/dl and 8%(16) of them 201-250 mg/dl.

Table No. 11 : Post Prandial Salivary Glucose Levels in Non-diabetic individuals

PPSGL (mg/dl)	No. of Patients	Percentage (%)
0 – 4	180	90
4.1 – 8	13	6.5
8.1 – 11	07	3.5
Total	200	100

The above table shows that the levels ranged between 0-11 mg/dl.90%(180) of them between 0-4, 6.5%(13) of them between 4.1-8 mg/dl and 3.5%(7) between 8.1-11 mg/dl.

Table12: Comparison of mean glucose levels in serum and saliva of diabetic and non diabetic individuals

Variables	Diabetic			Non diabetic			t	DF	P
	\bar{x}	SD	Range	\bar{x}	SD	Range			
Age	55.2	9.26	22-87	54.3	11.33	22-107	3.535	398	.000
FBS	162.2	7.47	74-563	99.2	12.98	60-134	11.758	398	.000
PPBS	240.9	6.95	94-520	144.3	32.18	85-246	17.807	398	.000
F.sal	5.1	5.60	0-31	2.2	1.81	.2-13.6	6.951	398	.000
PP.Sal	8	6.54	.6-39.3	2.7	1.69	.3-10.8	11.204	398	.000

Table 12 shows SD and mean (\bar{x}) between diabetic and non diabetic patients. Among the diabetic patients the mean age was 55.2 years (SD-9.26) and among non diabetic individuals it was 54.3 years. The mean fasting blood sugar levels mean in diabetic was 162.2 (SD 7.47) & 99.2 (SD 12.98) in non diabetic group. The mean post prandial blood sugar level mean in diabetic was 240.9 (SD 6.95) & 144.3 (SD 32.18) in non diabetic group. The mean fasting salivary sugar level in diabetics was 5.1 (SD 5.60) and 2.2 (SD 1.81) in non diabetic group. The mean post prandial salivary sugar levels in diabetics was 8(SD 6.54) & 2.7 (SD 1.69) in non diabetic group.

Table 13 :Comparison of saliva and serum glucose levels in diabetic group of patients those who were on medication and those who were not on medication

Among Diabetics :Medication					
Variables	On medication 136	Not on medication 64	T	DF	p
FBS	166.4±82.36	153.5 ± 54.74	1.648	198	0.101
PPBS	240.6 ± 75	241.5 ± 57.19	1.141	198	0.255
F.Sal	5.1 ± 5.59	5.2 ± 5.67	0.081	198	0.935
PP.Sal	7.9 ± 7.01	8.3 ± 5.46	0.474	198	0.636

Table 13 shows mean of serum and salivary sugar levels among diabetic patients with or without medication. There was no significant difference in serum and salivary sugar levels between patients with medication and without medication.

Table 14: Comparison of serum and salivary glucose levels between males and females (both diabetic and non-diabetic individuals)

Between Males and Females					
	Males(209)	Females(201)	T	DF	P
FBS	133.9±62.62	127.2±61.69	1.077	198	0.062
PBS	198.1±74.96	186.7±69.71	1.560	198	0.282
F. Sal	3.9±4.41	3.4±4.39	1.001	198	0.120
PP. Sal	5.9±6.26	4.7±4.37	2.283	198	0.023

The above table shows, serum and salivary sugar levels of males and females. Only the post prandial salivary sugar level showed significant difference between males and females.

Correlation between FBS and Fasting Saliva

Among Diabetics : r =0.303 P=0.000
 Among Non Diabetics: r=0.062 p=0.386
 Combined r=0.396 p=0.000

Correlation between PPBS and PP saliva

Among Diabetics: r=0.296 p=0.000
 Among non diabetics: r= 0.132 p=0.061
 Combined : r=0.504 p=0.000

Table 15a: Fasting salivary glucose level being 1mg/dl

FBS	F. Saliva		
	≥ 1	< 1	t
≥126	143 (TP)	3 (FN)	146
<126	231 (FP)	23 (TN)	254
T	374	26	

The above table shows comparison between fasting salivary glucose levels with fasting blood sugar levels when salivary glucose levels are 1 mg/dl. It was observed that Sensitivity = 97.9%, Specificity = 9.1%, Positive predictive value = 38.2% and Negative Predictive value = 88.5%.

Table 15 b: Salivary glucose levels being 1.5 mg/dl

FBS	Fasting Saliva		
	≥1.5	<1.5	T
≥126	126	20	146
<126	143	111	254
T	269	131	

The above table shows comparison between fasting salivary glucose levels with fasting blood sugar levels when salivary glucose levels are 1.5 mg/dl. Sensitivity = 86.3%, Specificity = 43.7%, Positive Predictive value = 43.7% and Negative Predictive Value = 84.7% was observed.

Table 15c : Salivary glucose levels being 2 mg/dl

FBS	Fasting Saliva		
	≥ 2	< 2	T
≥ 126	107	39	146
< 126	101	153	254
T	208	192	

The above table shows comparison between fasting salivary glucose levels with fasting blood sugar levels when salivary glucose levels are 2mg/dl. Sensitivity= 73.3%, Specificity=60.2%, Positive Predictive value=51.4% and Negative Predictive Value=79.7% was obtained.

Table 15d: Salivary glucose levels being 2.5 mg/dl

FBS	Fasting Saliva		
	≥ 2.5	< 2.5	T
≥ 126	87	59	146
< 126	74	180	254
T	161	239	400

The above table shows comparison between fasting salivary glucose levels with fasting blood sugar levels when salivary glucose levels are 2.5 mg/dl. Sensitivity= 59.6%, Specificity=70.8%, Positive Predictive value=54% and Negative Predictive Value=75.3% was seen.

Table 15 e: Salivary glucose levels being 3 mg/dl

	Fasting Saliva		
FBS	≥ 3	< 3	T
≥ 126	72	74	146
< 126	56	198	254
T	128	272	400

The above tables shows comparison between fasting salivary glucose levels with fasting blood sugar levels when salivary glucose levels are 3 mg/dl. Sensitivity= 49.3%, Specificity=77.9%. Positive Predictive value=56.2% and Negative Predictive Value=72.29% was observed.

As per the above observations the best cut off point for Fasting saliva would be 2 mg/dl.

Post Prandial Saliva as screening procedure (PPS) against Post Prandial Blood sugar (PPBS)

16a: Salivary glucose levels being 1.5 mg/dl

	Post Prandial Sugar		
PPBS	≥ 1.5	< 1.5	T
≥ 200	166	5	171
< 200	213	16	229

The above table shows use of salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 1.5 mg/dl. Sensitivity = 97.1%, Specificity=6.9%, Positive Predictive value=43.6% and Negative Predictive Value=76.2% was observed.

16 b: Salivary glucose levels being 2 mg/dl

	Post Prandial Sugar		
PPBS	≥ 2	< 2	T
≥ 200	163	8	171
< 200	145	84	229

The above table shows salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 2 mg/dl. Sensitivity= 95.3%, Specificity=36.7%, Positive Predictive value=52.9% and Negative Predictive Value=91.3% was noticed.

16c: Salivary glucose levels being 2.5 mg/dl

	Post Prandial Sugar		
PPBS	≥ 2.5	< 2.5	T
≥ 200	153	18	171
< 200	90	139	229

The above table shows salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 2.5 mg/dl. Sensitivity= 89.5%, Specificity=62.9%, positive Predictive value=62.9% Negative Predictive Value=88.5% was observed.

16d: Salivary glucose levels being 3 mg/dl

	Post Prandial Sugar		
PPBS	≥ 3	< 3	t
≥ 200	145	26	171
< 200	74	155	229

The above table shows salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 3 mg/dl. Sensitivity= 84.8%, Specificity=67.7%, Positive Predictive value=66.2% and Negative Predictive Value=85.6% was observed.

16e: Salivary glucose levels being 3.5 mg/dl

PPBS	Post Prandial Sugar		
	≥ 3.5	< 3.5	t
≥ 200	137	34	171
< 200	53	176	229

The above table shows salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 3.5 mg/dl. Sensitivity= 80.1%, Specificity=76.8%, Positive Predictive value=72.1% and Negative Predictive Value=83.8% was seen.

16f: Salivary glucose levels being 4 mg/dl

PPBS	Post Prandial Sugar		
	≥ 4	< 4	t
≥ 200	135	3.6	171
< 200	49	180	229

The above table shows salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 4 mg/dl. Sensitivity= 78.9%, Specificity=78.6%, Positive Predictive value=73.3% and Negative Predictive Value=85.7% was observed.

16g: Salivary glucose levels being 4.5 mg/dl

PPBS	Post Prandial Sugar		
	≥ 4.5	< 4.5	t
≥ 200	126	45	171
< 200	42	187	229

The above table shows salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 4.5mg/dl. Sensitivity= 73.7%, Specificity=81.6% Positive Predictive value=75% and Negative Predictive Value=80.6% was seen.

16h: Salivary glucose levels being 5 mg/dl

PPBS	Post Prandial Sugar		
	≥5	<5	t
≥200	116	55	171
<200	37	192	229

The above table shows salivary glucose levels as screening mode in post prandial state when salivary glucose levels were 5mg/dl. Sensitivity= 67.8%, Specificity=83.8%, Positive Predictive value=75.8%. Negative Predictive Value=77.7% was seen.

By above observations it was seen that the best cut off points in post Prandial salivary level would be either 3.5 or 4 mg/dl

17 : Sensitivity and Specificity, positive predictive value (PPV) and negative predictive value (NPV) at different salivary glucose cut off values in fasting state

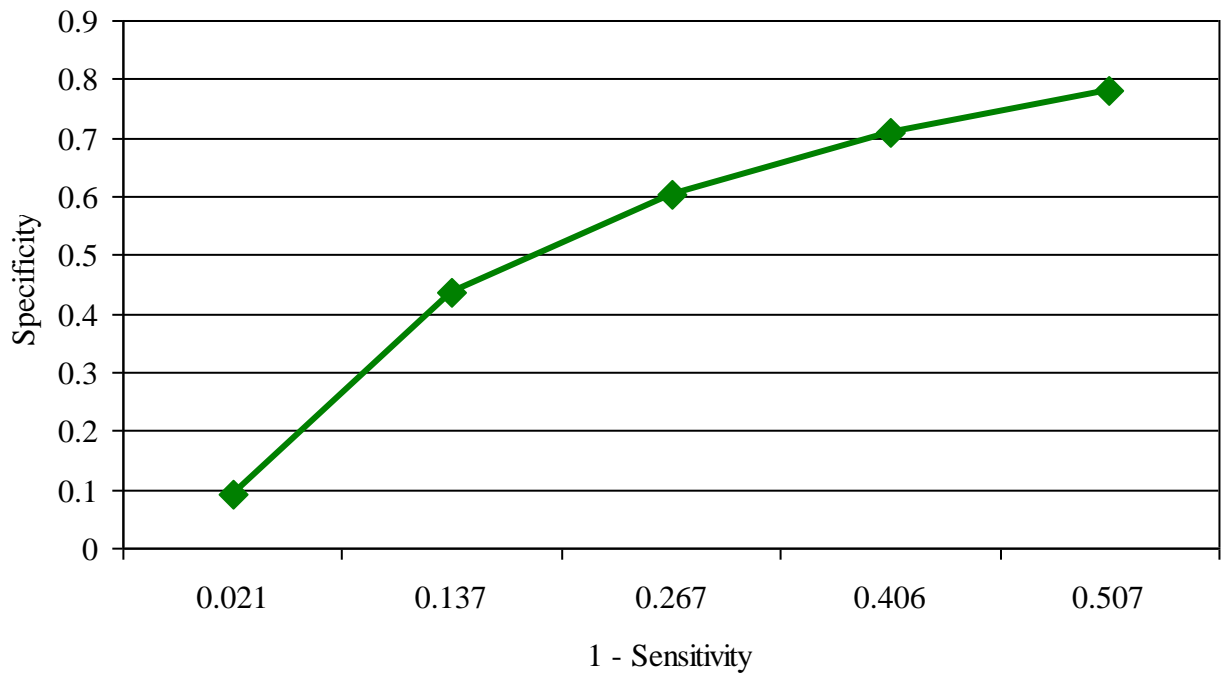
mg/dl	Sensitivity	Specificity	PPV	NPV
1	97.9	9.1	38.2	88.5
1.5	86.3	43.7	46.8	84.7
2	73.3	60.2	51.4	79.2
2.5	59.6	70.8	54	75.3
3	49.3	77.9	56.2	72.29

18 : Sensitivity and Specificity, positive predictive value (PPV) and negative predictive value (NPV) at different salivary glucose cut off values in post prandial state

mg/dl	Sensitivity	Specificity	PPV	NPV
2	95.3	36.7	52.9	91.3
2.5	89.5	62.9	62.9	88.5
3	84.8	67.7	66.2	85.6
4	78.9	78.6	73.3	85.7
4.5	73.7	81.6	75	80.6
5	67.8	83.8	75.8	77.7

The diagnostic accuracy of salivary sugar level (Fasting and PP) i.e. sensitivity, specificity, Positive predictive value and Negative predictive value were calculated taking serum sugar level (Fasting and post prandial) as a gold standard. These are presented in table no. 15a to 16h

Graph 1 : Showing Fasting Salivary Sugar Levels



Graph 2 : Showing Post Prandial Salivary Sugar Levels

