

Results

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Group (I) : Non – insulin dependent diabetes mellitus patients.

Group (II) : Insulin dependent diabetes mellitus patients.

Group (III) : Control group.

Table (1) and Figure (1): Shows demographic and some clinical character's of diabetic patients, including mean and standard deviation of age, ratio of male to female, ratio of oral to insulin therapy, percentage of some clinical data and ratio of poor controlled patients (HB A1 > 10%) to good controlled patients (HB A1 < 10%).

Table and Figure (2): Shows significant increases in fasting blood sugar, post-prandial blood sugar, cholesterol, triglycerides, LDL-cholesterol, glycosalyted hemoglobin, microalbumin and endothelin levels with significant decreases in nitric oxide level in group I when compared to control group.

Table and Figure (3): Shows significant increases in fasting blood sugar, post-prandial blood sugar, cholesterol, triglycerides, LDL-cholesterol, glycosalyted hemoglobin, microalbumin and endothelin levels with significant decreases in nitric oxide level in group II when compared to control group.

Table and Figure (4): Shows insignificant comparison between fasting blood sugar, post-prandial blood sugar, cholesterol, triglycerides, LDL-cholesterol, glycosalyted hemoglobin, microalbumin, endothelin, and nitric oxide in group I and group II.

Table and Figure (5): Shows significant increases in endothelin level and decreases in nitric oxide level in poor controlled diabetics (HB A1 > 10%) than good controlled diabetics (HB A1 < 10%).

Table and Figure (6): Shows significant increases in endothelin level and decreases in nitric oxide level in diabetics with retinopathy than those without retinopathy.

Table and Figure (7): Shows significant increases in endothelin level and decreases in nitric oxide level in diabetics with peripheral complications (as peripheral neuritis) than diabetics without.

Table and Figure (8): Shows significant increases in endothelin level and decreases in nitric oxide level in diabetics with hypertension than diabetics without.

Table and Figure (9): Shows significant increases in endothelin level and decreases in nitric oxide level in diabetics with nephropathy than diabetics without.

Table (10): Shows significant correlation's increase in endothelin level and the decrease in nitric oxide level with the increase in cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, glycated hemoglobin, microalbumin levels and retinopathy, peripheral complications, hypertension and nephropathy percentages in diabetics.

Table (11) and Figure (10): Shows significant regression's increase in endothelin level and decrease in nitric oxide level with the increase in cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, glycated hemoglobin, microalbumin levels and retinopathy, peripheral complications, hypertension and nephropathy percentages in diabetics.

Table (1): Demographic and clinical characteristics of diabetic patients

Age (years)	43.2 $\pm$ 18.47
Sex (♂/♀)	32/28
Clinical data	
. Diabetics with nephropathy	(32/60) 53.3%
. Diabetics with hypertension	(41/60) 68.3%
. Diabetics with retinopathy	(29/60) 48.3%
. Diabetics with peripheral complication	(31/60) 51.7%
Mode of therapy (oral / insulin)	32/28
Ratio of poor control diabetics (HbA1 > 10%) / Good control diabetics (HbA1 < 10%)	38/22

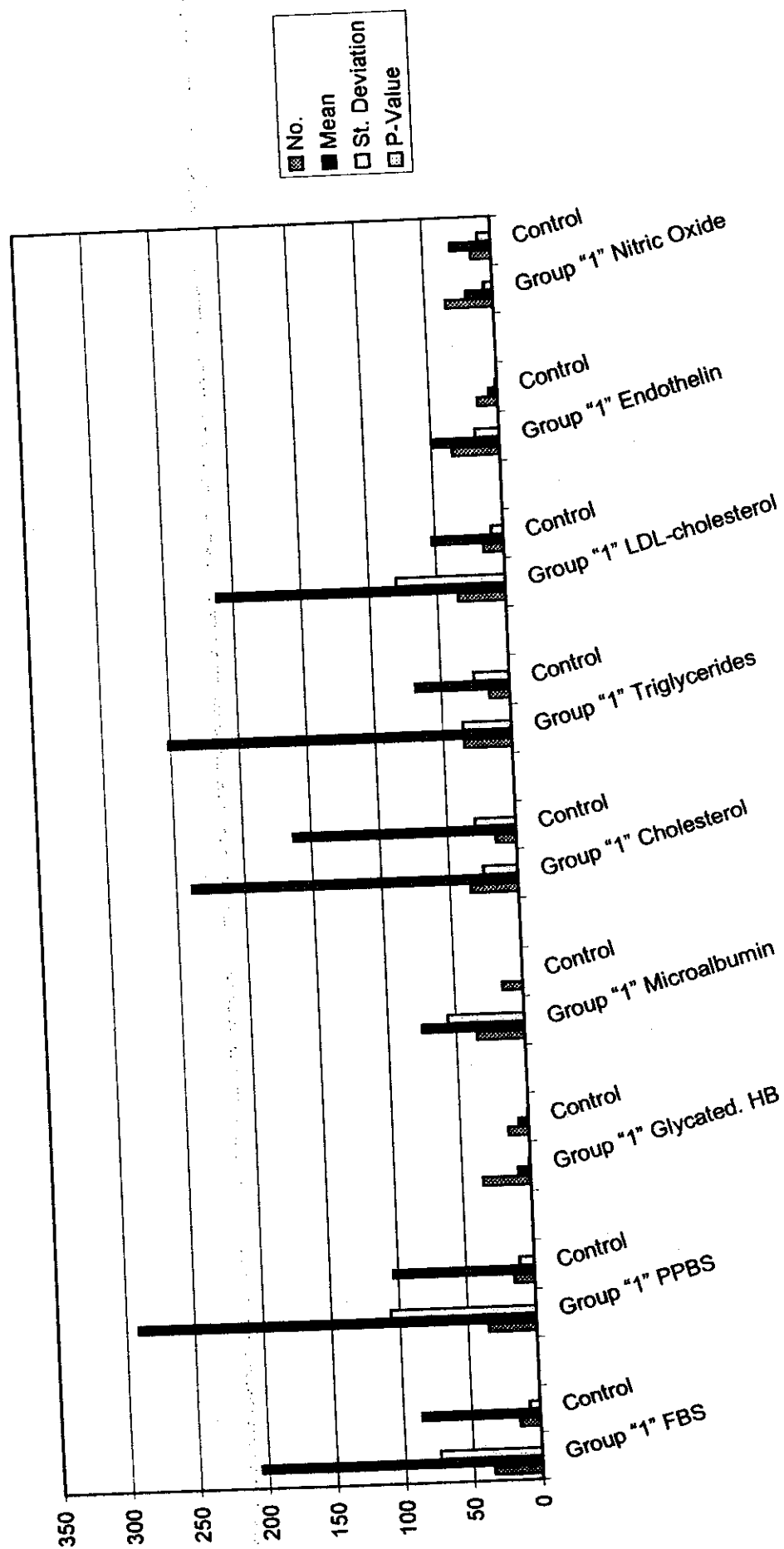


Figure (1):Ratio of males to females in diabetics

Table (2): Comparison of laboratory findings between non-insulin-dependent diabetic patients (Group I) and controls (Group III).

FBS mg/dl	Group "1"	35	204.8	± 73.7	0.001
	Control	15	86.2	± 7.5	
PPBS mg/dl	Group "1"	35	291.4	± 106.2	0.001
	Control	15	103.4	± 10.6	
Glycated HB %	Group "1"	35	9.1	± 0.74	0.001
	Control	15	6.9	± 0.55	
Microalbumin mg/L	Group "1"	35	75	± 55.6	0.001
	Control	15	0	0	
Cholesterol mg/dl	Group "1"	35	238.7	± 25.1	0.001
	Control	15	163.2	± 29.9	
Triglycerids mg/dl	Group "1"	35	251.5	± 35.2	0.001
	Control	15	69	± 25.8	
LDL-Cholesterol mg/dl	Group "1"	35	212.2	± 79.8	0.002
	Control	15	52.4	± 8.7	
Endothelin pg/ml	Group "1"	35	49.7	± 17.6	0.001
	Control	15	6.3	± 1.1	
Nitric Oxide uM/L	Group "1"	35	19.6	± 6.3	0.003
	Control	15	29.7	± 9.3	

(Sign P'-value < 0.05)



Figure(2): Comparison of laboratory findings between non-insulin dependent diabetic patients (group I) and controls (groupIII) .

Table (3) : Comparison of laboratory findings between insulin dependent diabetic patients (Group II) and Controls (Group III).

FBS mg/dl	Group "2"	25	202.6	±45.9	0.001
	Control	15	86.2	±7.5	
PPBS mg/dl	Group "2"	25	260.4	±83.4	0.001
	Control	15	103.4	±1.6	
Glycated HB %	Group "2"	25	9.2	±0.67	0.001
	Control	15	6.9	±0.55	
Microalbumin mg/L	Group "2"	25	98	±85.2	0.001
	Control	15	0	0	
Cholesterol mg/dl	Group "2"	25	240.2	±30.1	0.001
	Control	15	163.2	±29.9	
Triglycerids mg/dl	Group "2"	25	258.4	±36	0.001
	Control	15	69	±25.8	
LDL-Cholesterol mg/dl	Group "2"	25	208	±70.2	0.001
	Control	15	52.4	±8.7	
Endothelin pg/ml	Group "2"	25	51.4	±16.9	0.001
	Control	15	6.3	±1.1	
Nitric Oxide uM/L	Group "2"	25	19.1	±6	0.001
	Control	15	29.7	±9.3	

(Sign P-value < 0.05)

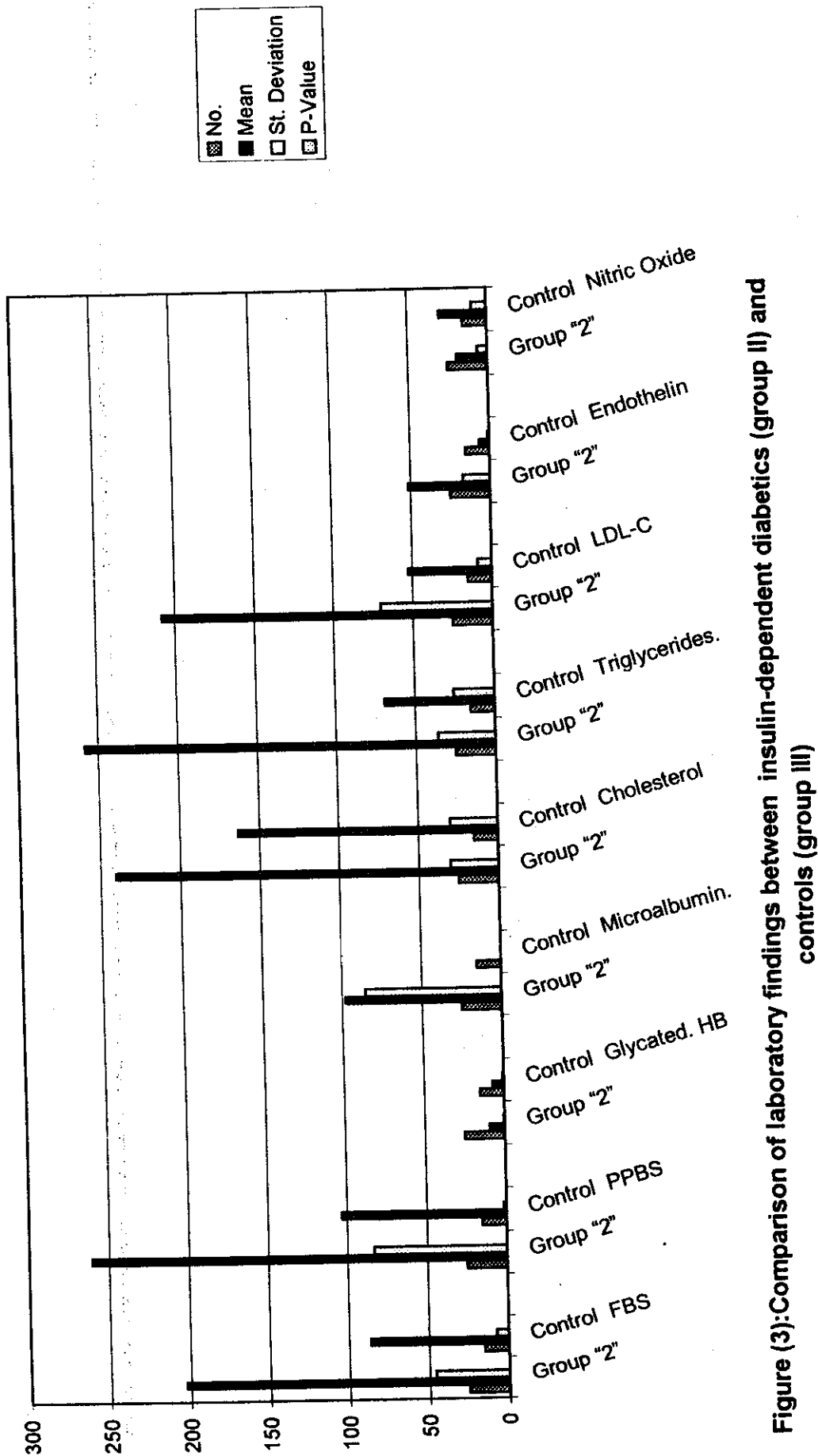


Figure (3): Comparison of laboratory findings between insulin-dependent diabetics (group II) and controls (group III)

Table (4): Comparison of Laboratory findings between non-insulin-dependent (group I) and insulin-dependent (Group II) diabetic patients.

FBS mg/dl	Group "1"	35	204.8	± 73.7	0.893
	Group "2"	25	202.6	± 45.9	
PPBS mg/dl	Group "1"	35	291.4	± 16.2	0.230
	Group "2"	25	260.4	± 83.8	
Glycated HB %	Group "1"	35	9.1	± 0.7	0.484
	Group "2"	25	9.2	± 0.6	
Microalbumin mg/L	Group "1"	35	75	± 55.6	0.211
	Group "2"	25	98	± 85.2	
Cholesterol mg/dl	Group "1"	35	238.7	± 25.1	0.831
	Group "2"	25	240.2	± 30.1	
Triglycerids mg/dl	Group "1"	35	251.5	± 35.2	0.464
	Group "2"	25	258.4	± 36	
LDL-Cholesterol mg/dl	Group "1"	35	212.2	± 79.8	0.926
	Group "2"	25	208	± 70.2	
Endothelin pg/ml	Group "1"	35	49.7	± 17.6	0.710
	Group "2"	25	51.4	± 16.9	
Nitric Oxide uM/L	Group "1"	35	19.6	± 6.3	0.758
	Group "2"	25	19.1	± 6	

(Sign P-value < 0.05)

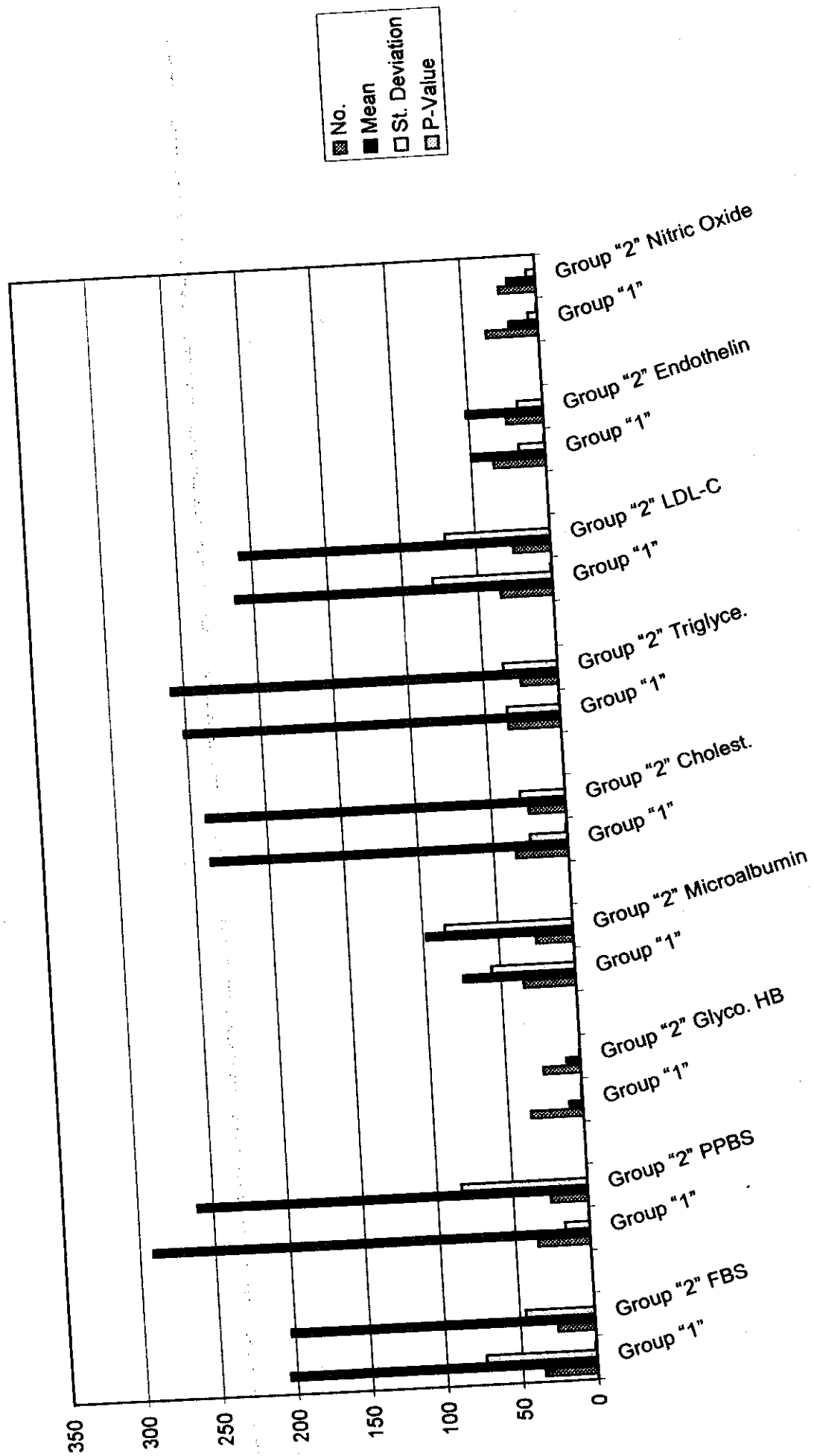


Figure (4): Comparison of laboratory findings between non-insulin dependent diabetics (groupI) and insulin-dependent diabetics (groupII).

Table (5): Comparison of endothelin and nitric oxide levels between good and poor controlled diabetics

	Type of Control	No.	Mean Rank	P-Value
Endothelin	Good Control	22	18.09	0.001
	Poor Control	38	37.68	
Nitric Oxide	Good Control	22	44.64	0.001
	Poor Control	38	22.32	

(Sign P-value < 0.05)

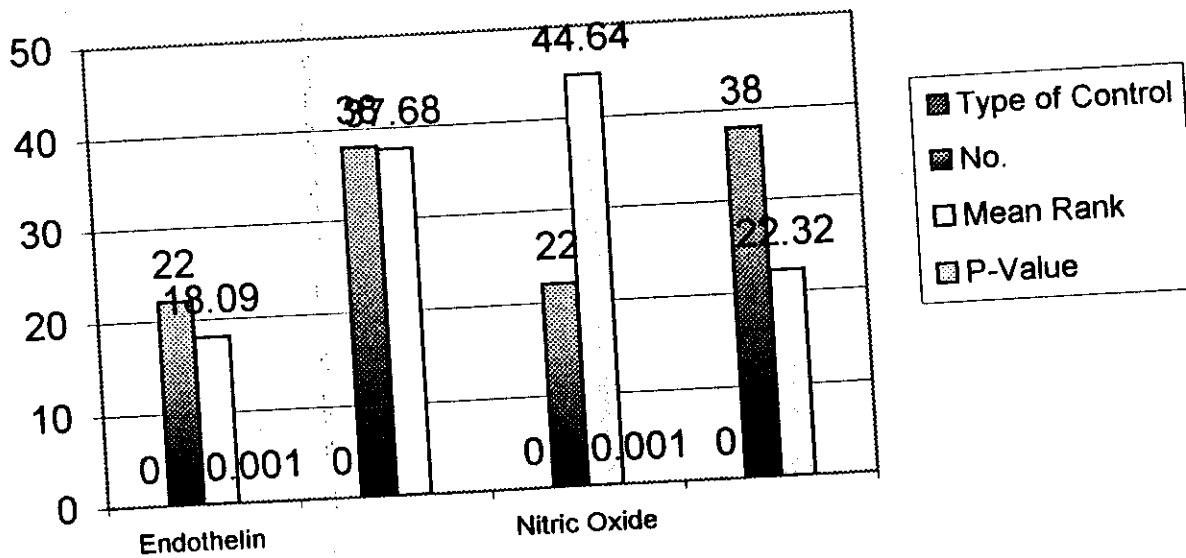


Figure (5): Comparison of endothelin and nitric oxide levels between good and poor controlled diabetics

Table (6): Comparison of endothelin and nitric oxide levels between diabetics with retinopathy and those without

	Retinopathy	No.	Mean Rank	P-Value
Endothelin	Positive	25	43.5	0.001
	Negative	35	21.21	
Nitric Oxide	Positive	25	19.28	0.001
	Negative	35	38.51	

(Sign P-value < 0.05)

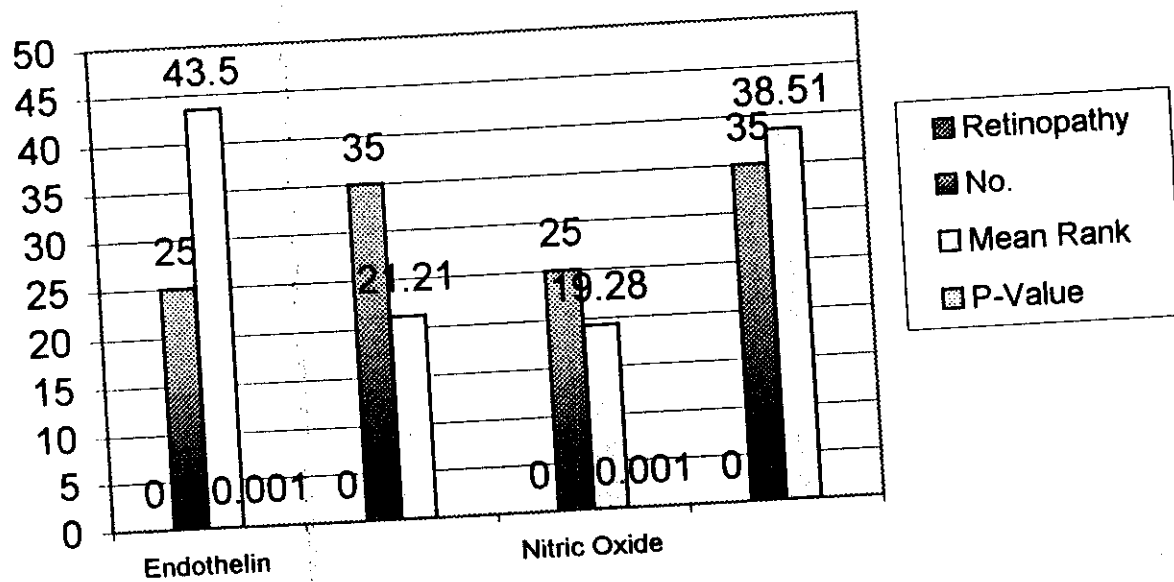


Figure (6): Comparison of endothelin and nitric oxide levels between diabetics with retinopathy and those without

Table (7): Comparison of endothelin and nitric oxide levels between diabetics with peripheral complications and those without

	Peripheral Complications.	No.	Mean Rank	P-Value
Endothelin	Positive	31	36.81	0.004
	Negative	29	23.76	
Nitric Oxide	Positive	31	23.02	0.001
	Negative	29	38.5	

(Sign P-value < 0.05)

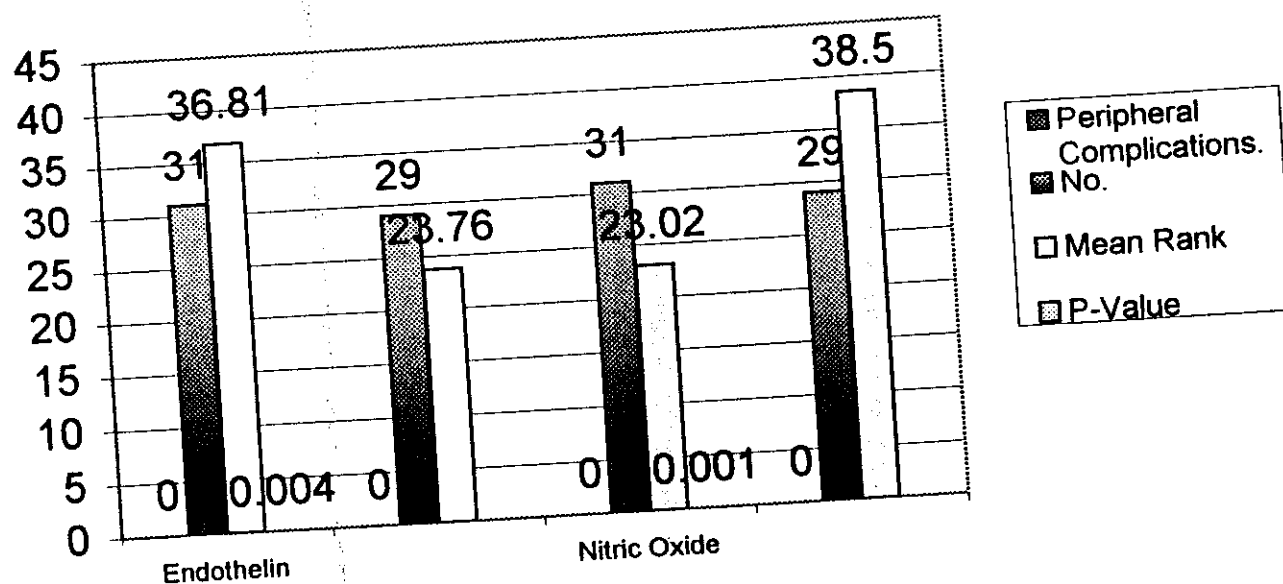


Figure (7): Comparison of endothelin and nitric oxide levels between diabetics with peripheral complications and those without

Table (8): Comparison of endothelin and nitric oxide levels between diabetics with hypertension and those without

	Hypertension	No.	Mean Rank	P-Value
Endothelin	Positive	42	34.95	0.003
	Negative	18	20.11	
Nitric Oxide	Positive	42	24.71	0.001
	Negative	18	44	

(Sign P-value < 0.05)

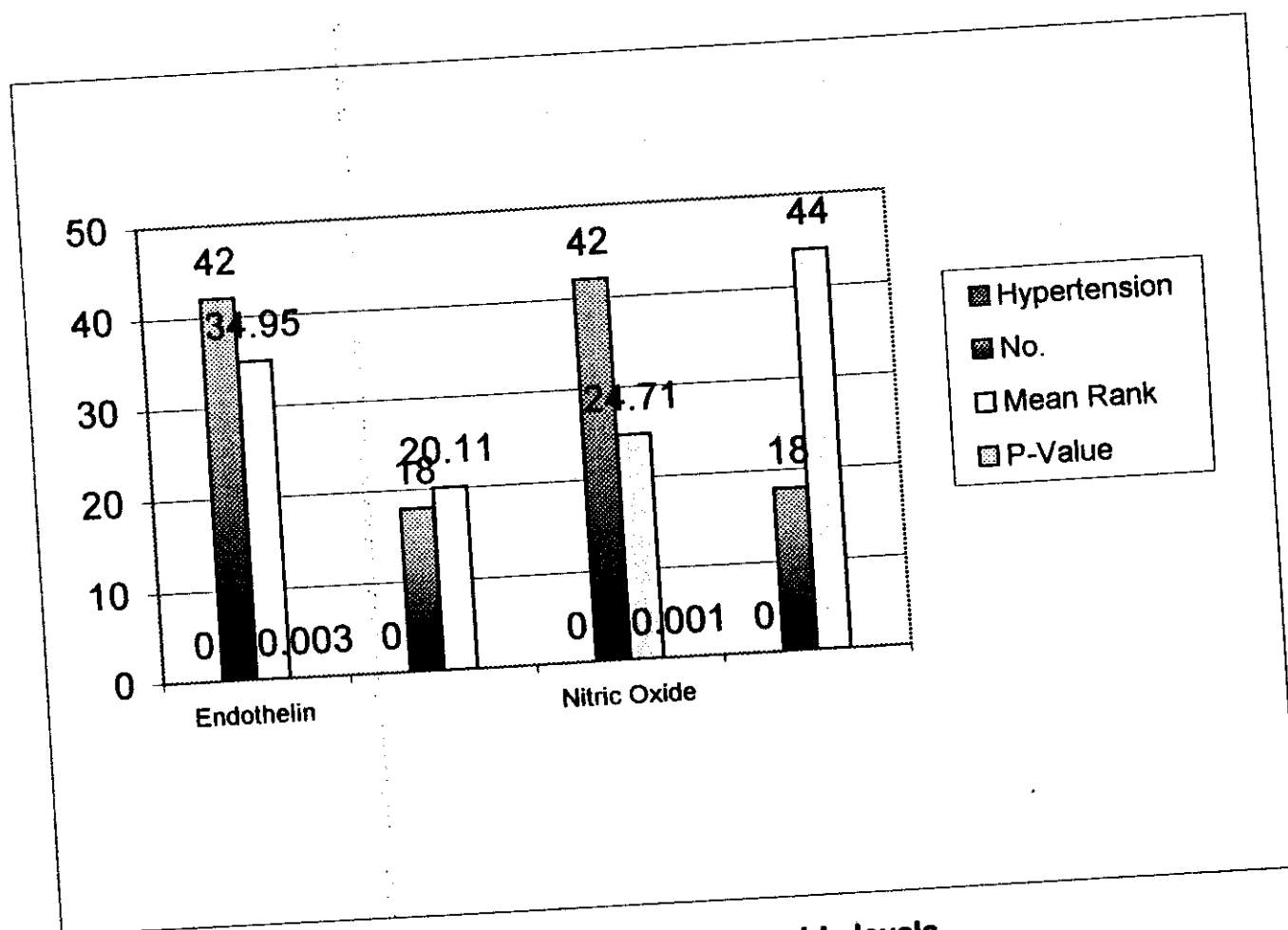


Figure (8): Comparison of endothelin and nitric oxide levels between diabetics with hypertension and those without

Table (9): Comparison of endothelin and nitric oxide levels between diabetics with nephropathy and those without

	Nephropathy	No.	Mean Rank	P-Value
Endothelin	Positive	41	31.8	0.002
	Negative	19	22.12	
Nitric Oxide	Positive	41	21.62	0.001
	Negative	19	64.54	

(Sign P-value < 0.05)

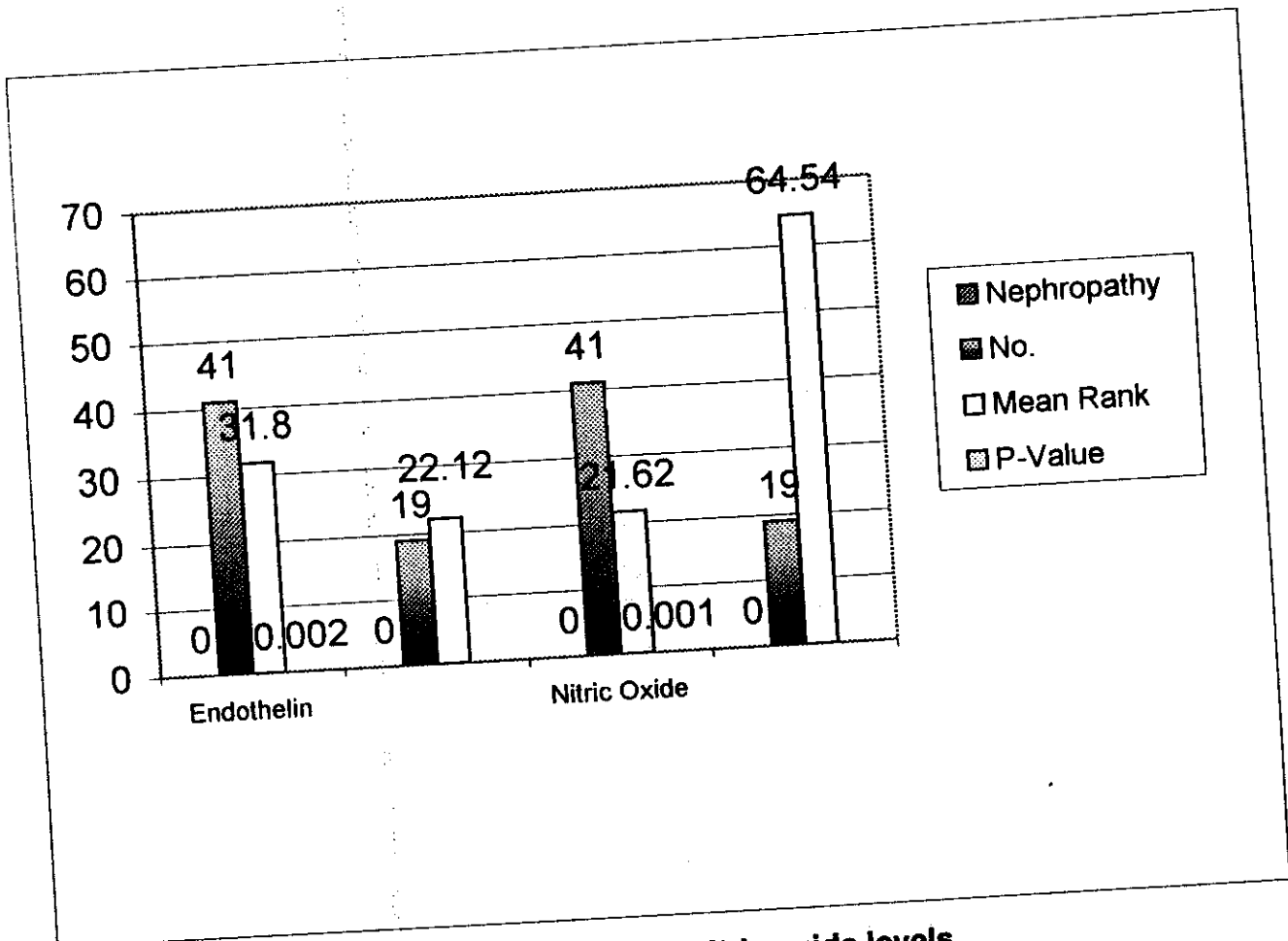


Figure (9): Comparison of endothelin and nitric oxide levels between diabetics with nephropathy and those without

Table (10): Correlation of endothelin and nitric oxide and some laboratory and clinical data.

	Endothelin	Nitric oxide	Cholesterol	Glycated Hb	Retinopathy	HDL	HbA1c	Microalbuminuria	Nephropathy	Proteinuria	Uric acid		
Endothelin	Pearson correlation	1.000	-0.868	0.851	0.668	0.675	0.412	430	0.829	0.762	0.333	0.390	0.832
	P-value	.	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.009	0.002	0.000
Nitric Oxide	Pearson Correlation	-0.868	1.000	-0.821	-0.576	-0.612	-	-0.536	-0.794	-0.543	-0.377	-0.464	-832
	P-value	0.001	.	0.001	0.001	0.001	0.480	0.001	0.001	0.00	-0.003	0.000	0.000

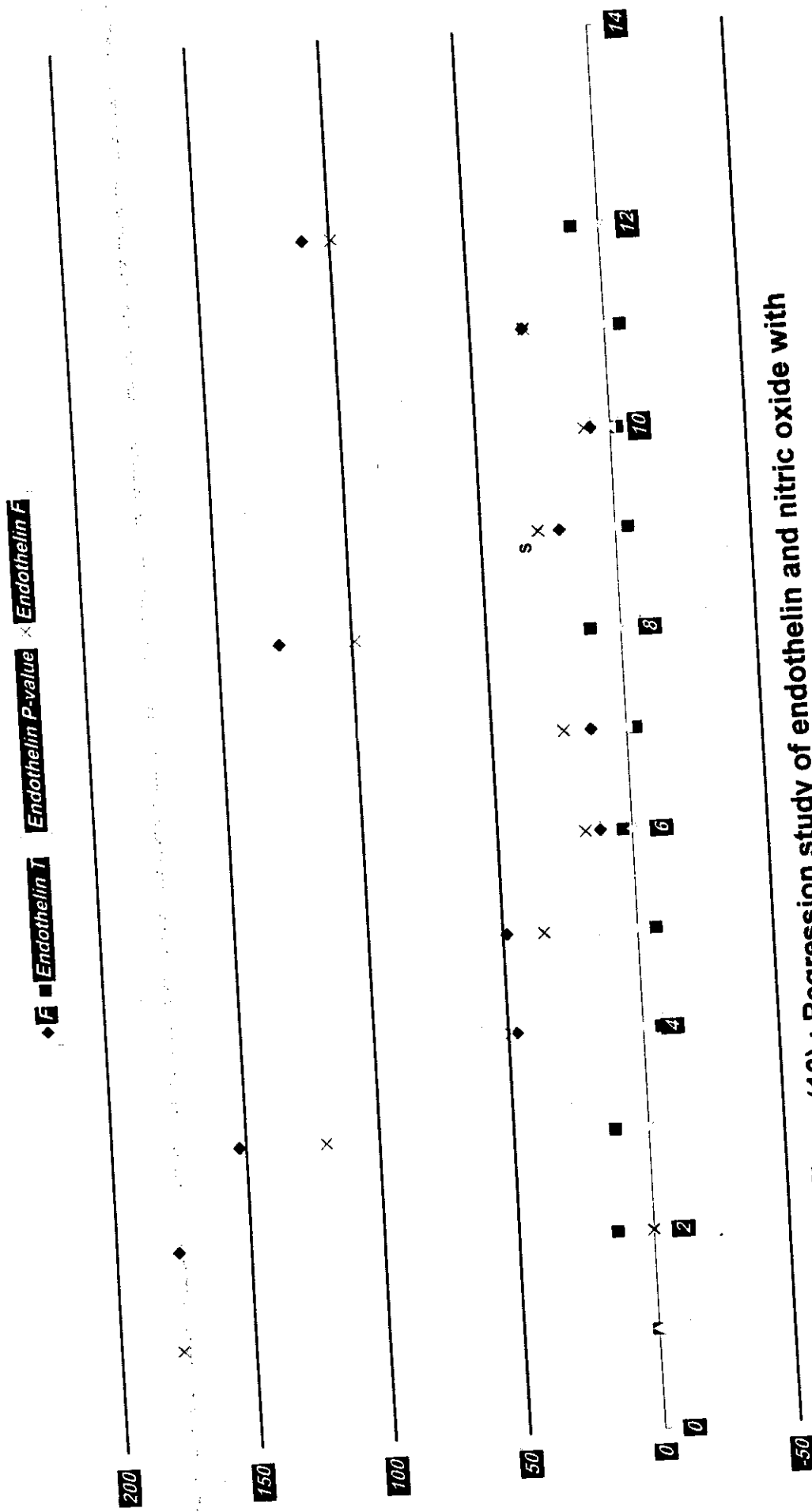
(Sign P-value < 0.05)

Correlation of endothelin and nitric oxide to glycated hemoglobin microalbuminuria, lipogram and clinical complications.

Table (11): Regression of endothelin and nitric oxide with laboratory and clinical data.

Table (11): Regression of endothelin and nitric oxide with laboratory and clinical data.												
	Endothelin	Nitric Oxide	Glucose	Renin	Hypertension	Microalbuminuria	Nephropathy	Proteinuria	Peritoneal Dialysis			
Endothelin	F	-	152.5	46.8	48.6	11.8	13.1	127.3	20.7	7.23	30.6	110.2
	T	-	176.886	6.8	6.9	3.4	3.6	11.2	4.8	2.6	5.8	10.2
	P-value	-	0.000	0.002	0.000	0.008	0.004	0.003	0.005	0.009	0.006	0.007
Nitric Oxide	F	-176.886	-119.9	-48.9	-34.6	-17.3	-23.3	-98.9	-28.7	-9.6	-29.9	-99.5
	T	-13.298	-10.9	-6.9	-5.8	-4.1	-4.8	-9.9	-4.5	-5.02	-4.7	-9.8
	P-value	0.01	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000

(Sign P-value < 0.05)



Figure(10) : Regression study of endothelin and nitric oxide with
laboratroy and clinical data

Master Sheet

Table (12) : shows laboratory and clinical data of non-insulin dependent diabetics (Group 1). (master sheet (1))

Table (12) : shows laboratory and clinical data of non-insulin dependent diabetes (NIDDM)																								
Laboratory Data												Clinical data												
No.	FBS mg/dl	PPBS mg/dl	Serum creatinine mg/dl	Lipid Pattern					Glycosylated Hb(%)	Microalbumin mg/L	Nitric Oxide uM/L	Endothelin Pg/ml	Age (years)	Sex		Duration of D.M (years)	Mode of therapy		Presence of complication					
				Total cholesterol mg/dl	Triglyceride mg/dl	HDL-cholesterol mg/dl	LDL-cholesterol mg/dl	+						-	Oral		Insulin	Hypertension	Retinopathy	Skin	Phlebotomy	Nephropathy		
1	206	310	0.9	230	261	30	147.8	10.2	50	16.8	59.3	64	+	-	-	10	+	-	+	+	+	+	-	-
2	156	230	0.8	260	281	31	172.8	10.5	50	11.0	53.4	50	-	+	+	0.2	+	-	+	+	+	+	+	+
3	253	360	1.0	270	203	39	190.4	10.1	75	15	61.7	52	+	-	-	1	+	-	-	+	+	+	+	+
4	87	125	15.8	230	225	30	155	8.5	200	26.8	34.9	33	+	+	+	2	+	-	+	+	+	+	+	+
5	200	295	2.8	240	229	31	163.2	8.7	250	26	34.1	70	-	+	+	1	+	-	+	+	+	+	+	+
6	360	500	5.9	253	261	32	168.8	10.6	75	19.5	72.2	40	+	-	-	5	+	-	+	+	+	+	+	+
7	410	550	1.3	250	290	29	163	11.3	100	14.8	56.4	55	-	+	+	3	+	-	+	+	+	+	+	+
8	179	260	0.9	260	290	32	170	10.2	50	13	57	50	+	-	-	5	+	-	+	+	+	+	+	+
9	259	320	0.8	233	281	31	145.8	10.3	50	11	71.5	52	-	+	+	0.5	+	-	+	+	+	+	+	+
10	115	160	0.8	223	241	30	143.8	11.5	75	14	59.9	49	-	+	+	1.5	-	-	+	+	+	+	+	+
11	210	300	0.9	273	292	30	148.6	10.4	100	12	56.4	45	-	-	-	2	+	-	+	+	+	+	+	+
12	249	350	0.6	241	262	28	160.6	10.1	100	15.2	59.3	43	+	-	-	3.5	+	-	+	+	+	+	+	+
13	159	127	1.1	235	271	27	153.8	10.9	75	16.2	64.1	52	+	-	-	6	+	-	+	+	+	+	+	+
14	275	365	0.8	290	359	28	200.2	10.5	100	17.2	59.3	53	+	-	-	5	+	-	+	+	+	+	+	+
15	195	267	0.9	273	299	31	182.2	10.6	50	12.5	59	47	-	+	+	20	-	-	+	+	+	+	+	+
16	141	200	3.5	282	310	26	194	12	250	7.5	94.5	69	-	+	+	3	+	-	+	+	+	+	+	+
17	195	273	0.8	280	320	32	184	10.2	70	14	67.2	65	-	-	-	2	+	-	-	+	+	+	+	+
18	125	155	0.7	205	225	31	129	8.5	50	24.3	32.3	43	+	-	-	1	+	-	-	+	+	+	+	+
19	261	352	1.8	213	230	32	135	9.3	50	23.9	28.6	58	+	-	-	5	+	-	+	+	+	+	+	+
20	150	177	2.5	265	291	31	175.8	10.5	100	19.4	67.8	57	-	+	+	2	+	-	-	+	+	+	+	+
21	210	305	0.8	212	230	27	139	8.1	50	28	23.6	48	-	-	-	4	+	-	-	+	+	+	+	+
22	300	460	0.7	211	220	31	136	8.3	50	6.7	32.3	60	-	-	-	5	+	-	-	+	+	+	+	+
23	234	365	0.5	223	230	32	145	8.9	50	26	30.1	43	-	-	-	2	+	-	-	+	+	+	+	+
24	140	195	0.8	253	271	29	169.8	10.6	100	12	60.5	55	-	+	+	1	+	-	-	+	+	+	+	+
25	310	500	0.7	249	280	28	165	10.9	100	20	59.9	54	+	-	-	7	+	-	-	+	+	+	+	+
26	179	200	0.9	235	277	29	150.6	10.2	50	15	52.9	50	-	+	+	0.5	+	-	-	+	+	+	+	+
27	180	250	0.7	211	212	30	138.6	8.5	50	25.2	31.5	43	-	+	+	0.4	+	-	-	+	+	+	+	+
28	155	270	0.6	259	225	31	133	8.7	25	28	32.3	47	-	-	-	1.5	+	-	-	+	+	+	+	+
29	125	250	1.0	219	230	33	140	9.0	20	27	34.9	44	-	+	+	3	+	-	-	+	+	+	+	+
30	189	303	0.5	213	225	32	136	8.7	50	28	29.3	50	-	-	-	2	+	-	-	+	+	+	+	+
31	160	262	0.6	208	220	30	134	8.8	20	25	24.0	48	+	+	+	1	+	-	-	+	+	+	+	+
32	120	150	0.8	213	240	31	134	8.5	20	28	30.8	52	+	+	+	4	+	-	-	+	+	+	+	+
33	200	237	0.7	260	290	29	173	10.5	50	15.7	56.4	52	-	-	-	2	+	-	-	+	+	+	+	+
34	222	410	0.9	210	230	30	134	8.7	20	25.7	34.1	43	-	-	-	5	+	-	-	+	+	+	+	+
35	357	397	188	225	260	32	141	7.9	50	25	34.9	142	-	-	-	+	+	-	-	+	+	+	+	+

No.	FBS mg/dl	PPBS mg/dl	Serum creatinine mg/dl	Lipid Pattern					Microalbumin mg/L	Nitric Oxide uM/L	Endothelin Pgm/L	Age (years)	Sex		Duration of D.M (years)	Mode of therapy		Presence of complication				
				Total cholesterol mg/dl	Triglyceride mg/dl	HDL-cholesterol mg/dl	LDL-cholesterol mg/dl	Glycosylated Hb(%)										Hypertension	Retinopathy	Skin	Peripheral	Nephropathy
				mg/dl	mg/dl	mg/dl	mg/dl						+	-		Oral	Insulin					
36	310	500	0.8	204	229	32	126.2	8.9	200	25.7	33	31	+	-	15	-	+	-	+	-	+	-
37	253	420	1.0	265	290	30	177	10.3	50	18	71.6	42	+	-	26	-	+	+	+	-	+	+
38	250	305	0.8	239	260	29	158	12.2	100	6.5	61.1	25	-	+	5	-	+	+	+	+	+	+
39	260	462	0.9	271	285	28	186	10.9	50	11.4	77.6	20	+	-	7	-	+	+	-	-	+	+
40	135	195	0.8	208	229	32	130.2	9	20	24	30.8	30	+	-	12	-	+	+	+	+	-	-
41	102	160	0.7	259	288	30	171.4	10.1	50	13	54	29	+	-	19	-	+	+	-	-	+	+
42	290	310	3.0	249	273	27	167.4	10.3	200	15	58.1	20	+	-	3	-	+	+	-	-	+	+
43	208	270	3.2	272	299	26	186.2	10.8	200	14.8	69.6	25	-	+	4	-	+	-	-	-	-	-
44	190	280	1.1	210	223	32	133.4	8	50	26.4	38.9	20	-	-	2	-	+	+	-	-	+	-
45	188	260	1.0	243	271	30	158.8	11.9	50	15.5	56.4	40	+	-	22	-	+	+	-	-	+	-
46	210	255	0.9	262	282	300	175.6	10.2	100	12.7	53.4	30	-	+	13	-	+	+	+	-	+	+
47	220	230	0.8	270	310	29	179	11	100	13.3	74.9	28	-	+	10	-	+	-	-	-	+	+
48	203	230	1.5	213	210	32	139	9.1	20	28	34.5	27	+	-	11	-	+	+	-	-	+	+
49	189	201	0.8	259	265	29	177	11.3	100	16	63.5	28	-	+	5	-	+	+	-	-	+	+
50	199	230	4.1	260	277	30	174.6	10.9	300	17.5	54.6	27	-	-	9	-	+	+	-	-	+	+
51	201	220	5.0	270	289	28	184.2	10.5	250	12.7	62.3	23	-	+	10	-	+	+	+	-	+	+
52	211	215	2.5	281	300	27	195	10.3	200	13.7	63.4	33	+	-	30	-	+	+	+	-	-	-
53	133	190	0.7	208	212	32	133.6	8.8	50	28	50.1	32	-	-	13	-	+	+	+	+	+	+
54	160	199	3.0	301	330	25	210	11.5	200	10	82.4	22	-	-	5	-	+	+	-	-	-	-
55	190	220	0.8	202	210	33	127	8.5	20	21	34.9	28	-	-	6	-	+	+	-	-	-	-
56	200	260	0.5	212	229	32	134.2	8.6	20	23.8	31.5	31	-	-	12	-	+	+	+	-	-	-
57	201	229	0.8	209	230	31	132	10.9	50	26.6	31.9	32	+	+	10	-	+	+	-	+	-	-
58	190	240	0.9	211	220	32	135	11	50	23.3	28.2	28	+	+	9	-	+	+	+	+	-	-
59	178	230	0.8	219	230	33	140	11.1	50	27.5	34.1	35	+	+	15	-	+	+	+	+	-	-
60	195	220	0.7	210	320	33	133	12	20	23.9	34.9	29	+	+	9	-	+	+	+	+	-	-

Table (14): shows laboratory and clinical data of control group (Group III). Master sheet (3).

Laboratory Data														Sex	
No.	FBS mg/dl	PPBS mg/dl	Serum creatinine mg/dl	Lipid Pattern				Glycosylated Hb(%)	Microalbumin mg/l	Nitric Oxide uM/l	Endothelin Pg/ml	Age (years)		+	-
				Total cholesterol	Triglyceride mg/dl	HDL-cholesterol	LDL-cholesterol								
61	79	108	0.6	120	65	42	65	6.5	0	36.4	5.8	30	+	+	+
62	90	110	0.9	80	50	39	31	7.1	0	26.6	7.7	65	+	+	-
63	82	99	0.5	150	85	60	117	7.3	0	20	8.1	44	+	+	-
64	85	98	0.8	142	99	59	63.2	6.1	0	30	6.9	50	-	+	+
65	80	95	7.0	161	105	61	79	6.8	0	38.5	4.8	39	+	+	-
66	78	92	1	173	101	50	102.8	7.4	0	23	6.3	40	-	+	+
67	100	130	0.9	181	113	55	103.4	7.2	0	42.2	7.2	52	-	+	+
68	84	101	0.9	195	65	62	120	6.9	0	28.4	5.7	35	-	+	+
69	84	99	0.7	170	62	39	118.6	6.5	0	33.5	3.6	32	-	+	+
70	77	90	0.4	182	73	62	105.4	6.2	0	52.2	7.2	50	+	+	-
71	102	120	0.6	179	45	57	113	7.8	0	19.5	5.9	65	-	+	+
72	91	105	0.7	185	55	60	114	7.5	0	19.2	6.5	46	+	+	-
73	89	95	0.6	175	39	52	115.2	7.1	0	26.5	5.1	54	+	+	-
74	92	106	0.9	183	44	42	131.2	7.5	0	24.4	7.1	59	+	+	-
75	82	103	1.0	172	35	45	120	6.5	0	26.5	6.9	25	+	+	-