Results

The study included 30 patients, 20 males (66%) and 10 females (33%).

Their ages ranged from 36 to 72 years, with mean age (54) year, 19of them were younger than 60 years (64%) , 11 patients were older than 60 years (36%).

Table (5): Demographic and baseline clinical characters.

		No.	%
Age	>6oy	11	36%
	<6oy	19	64%
Sex	Male	20	66%
	Female	10	33%
HTN	Yes	13	43%
	No	17	57%
DM	Yes	17	56%
	No	13	44%
Smoking	Yes	17	56%
	No	13	44%

Thirteen patients (43 %) were hypertensive while 16 patients (57 %) were normotensive.

Of our study population, 13 patients (44%) were non-diabetic and 17 (56%) patients were diabetics, 5 of them had type I diabetes mellitus (29%) but 12 patients had type II diabetes mellitus (70%).

In our study, 17 patients were current smokers and 13 patients had never smoked.

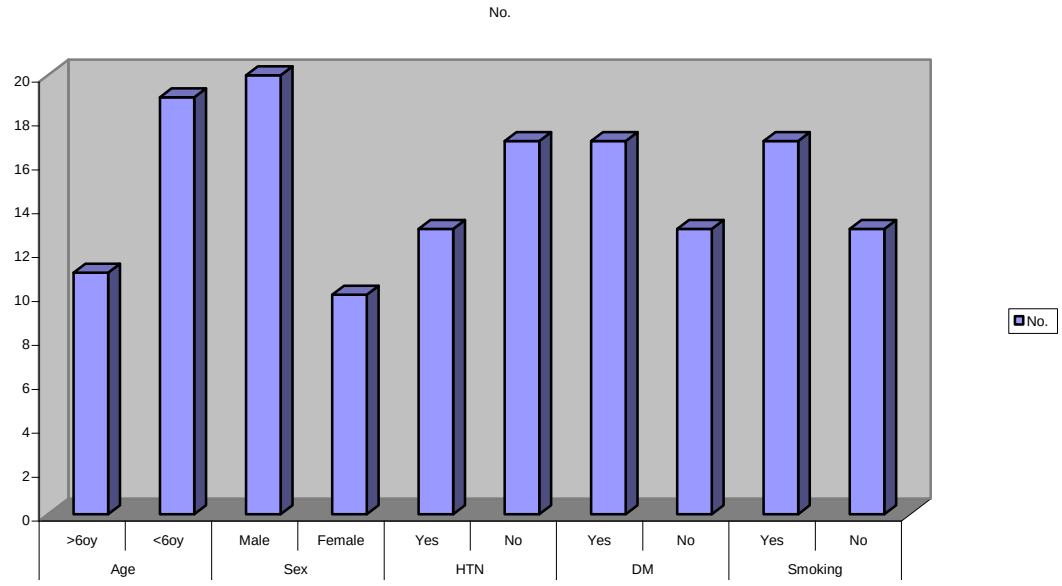


Figure (4) ; baseline demographic characters of studied patients

Table (6) aetiology of heart failure of studied patients

Aetiology	Number	%
Ischemic	14	46%
HTN	9	30%
Valvular	3	10%
Others	4	13%

Among our study , 14 patients (46%) were ischemic, 9 patients(30%) were hypertensive, but 3 patients(10%)valvular.

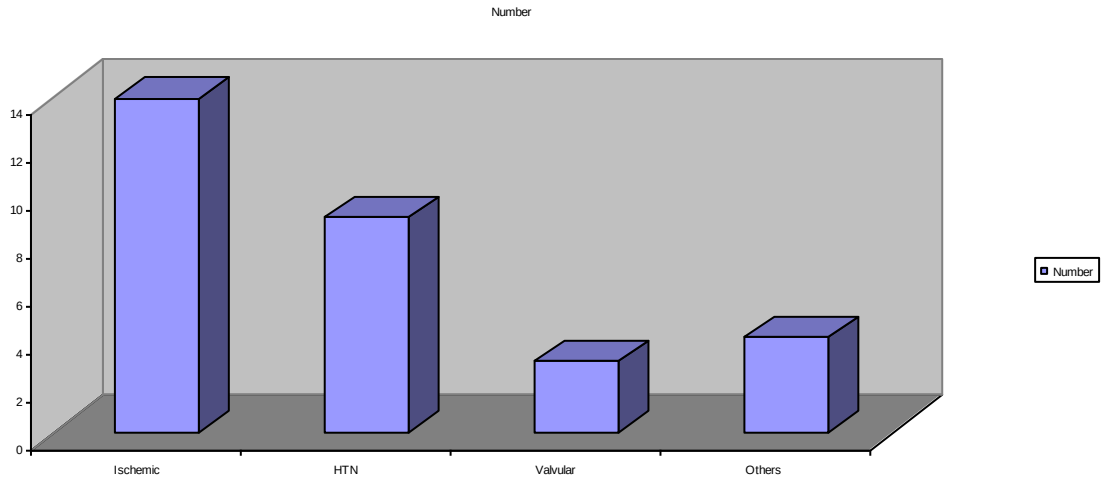


Figure (5)**; Aetiology of heart failure of studied patients**

Table (7); ECG rhythm of studied patients

	Group II		Group I	
	No.	**%**	**No.**	**%**
Sinus rhythm	11	73%	13	86%
AF	2	13%	4	26%

As regard active group,11 patients (73%) had sinus rhythm in ECG ,4 Patients (26%) had AF,while in control group,13patients (86%) had sinus rhythm,2 patients(13%) had AF

Table (8) baseline characters of Group I

		No.	%
Age	>60	6	40%
	<60	9	60%
Sex	Male	10	66%
	Female	5	44%
HTN	Yes	8	53%
	No	7	47%
DM	Yes	8	53%
	No	7	47%
Smoking	Yes	8	53%
	No	7	47%

Table (6) shows that The ages of the patients ranged from 35 to 65 years, with mean age (49± 16) year, 9 of them were younger than 60 years (60%), while 6 patients were older than 60 years (40%).

In our study, 8 patients were current smokers and 7 patients had never smoked.

Of our study population, 7 patients (47%) were non-diabetic and 8 (53%) patients were diabetics, 3 of them patients had type I diabetes mellitus (37%) and 5 patients had type II diabetes mellitus (62%).

Eight patients (53 %) were hypertensive while the remaining 7 patients (47 %) were normotensive.

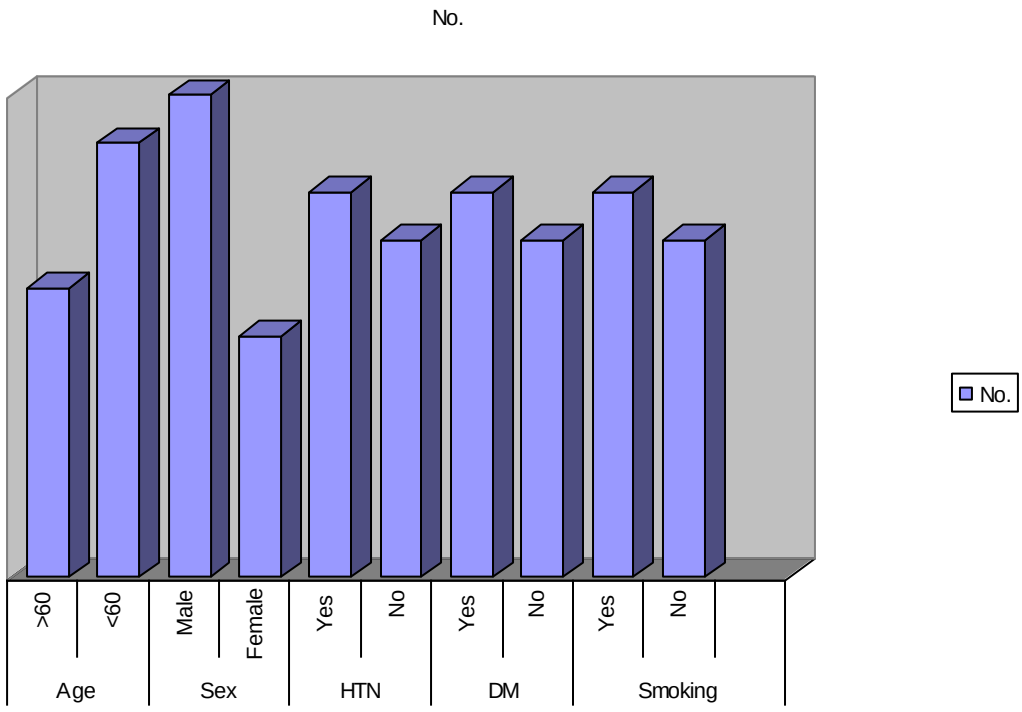


Figure (6) ; baseline demographic characters of Group I

Table (9) base line characters of group II

		No.	%
Age	>60	5	33%
	<60	10	77%
Sex	Male	10	66%
	Female	5	44%
HTN	Yes	5	33%
	No	10	77%
DM	Yes	9	60%
	No	6	40%
Smoking	Yes	9	60%

	No	6	40%

The ages of the patients ranged from 37to 75 years, with mean age (56± 20) year, 10 of them were younger than 60 years (77%), while 5 patients were older than 60 years (33%).

In our study, 9 patients were current smokers and 6 patients had never smoked..

Of our study population, 6 patients (40%) were non-diabetic and 9 (60%) patients were diabetics, 2 of them had type I diabetes mellitus (22%) and 7 patients had type II diabetes mellitus (77%).

Five patients (33 %) were hypertensive while the remaining 10 patients (77 %) were normotensive.

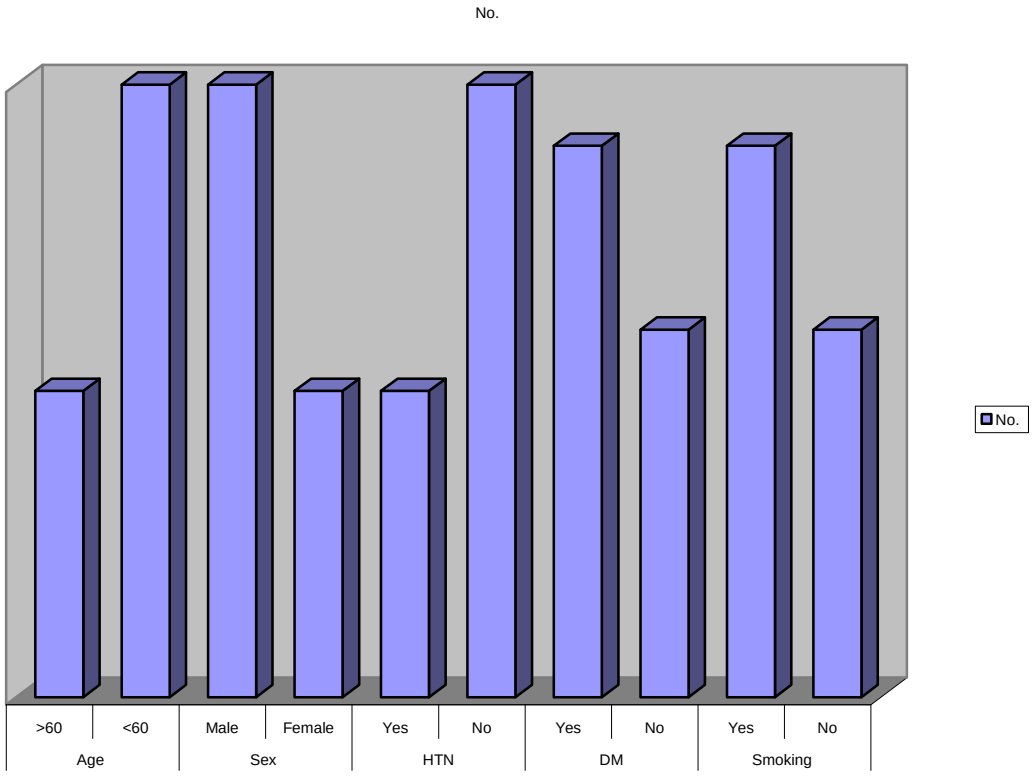


Figure (7) ; baseline demographic characters Group II

GROUPS / Variables	Group I		Group II		t	p
	mean	sd	mean	sd		
Age	58.60	7.09	58.93	8.67	0.1	>0.05
SBP	133.27	16.08	130.67	21.86	0.3	>0.05
HR	٧٨,٤٠	٩,٤٦	٧٨,٨٠	١٣,١٩	٠,٢	>0.05

LVEF	٣٧,٦٠	٤,٥٤	37.46	٦,٢٧	٠,١	>0.05
LVDD	٧٣,٠٦	٨,٨٢	٧٢,٥٣	١٢,١٤	٠,٢	>0.05

Table (10): comparison between group I and l group II :

In the current study the main age of group I was 58.6 ± 7.08versus 58.93 ± 8.67 in group II .

As regard the mean SBP in group I it was 133.27± 16.08 versus 130.67 ± 21.86 in group II .

As regard heart rate the mean HR in group I was 78.4 ± 9.46 versus 78.8 ± 13.19 in group II.

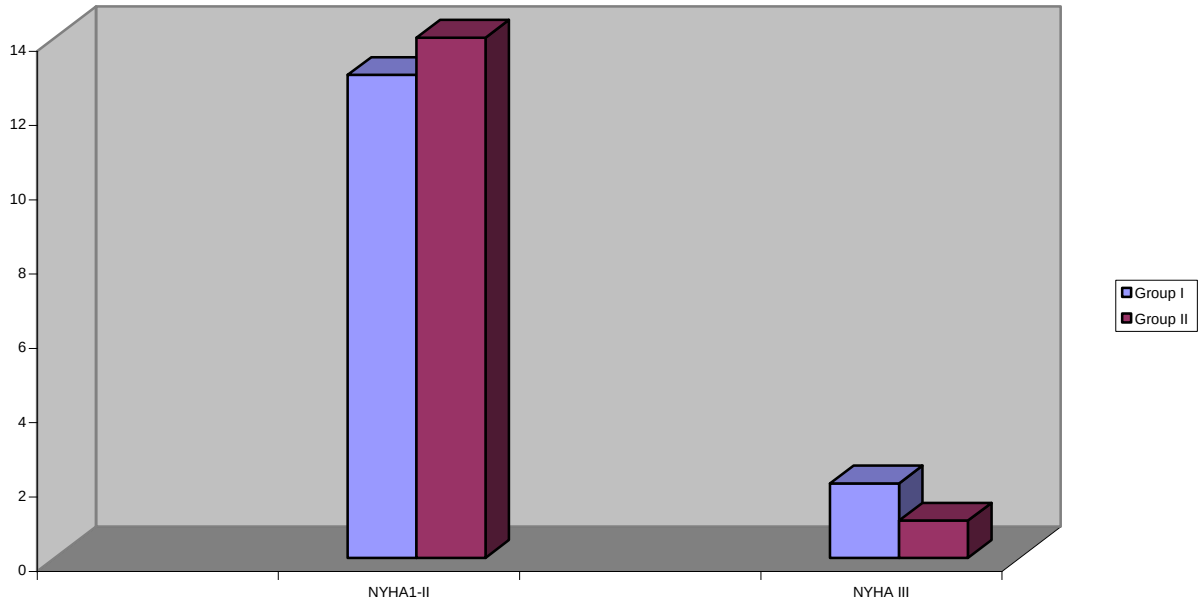
As regard the LVEF , for group I it was 37.6 ± 4.54 versus 37.46 ± 6.27 in group II .

As regard the LVDD for group I it was 73.06 ± 8.82 versus 72.53 ± 12.14

Table (11) functional class of studied patients

functional class	**All patients**	**Group I**	**Group II**	**p**
NYHA1-II	27	13	14	>0.05
NYHA III	3	2	1	>0.05

In the current study there were 13 patients (86%) of group I & 14 patients (93%)of group II in NYHA (1-11), while 2 patient(13%)of group I & 1 patients (6%)of group II in NYHA (111).

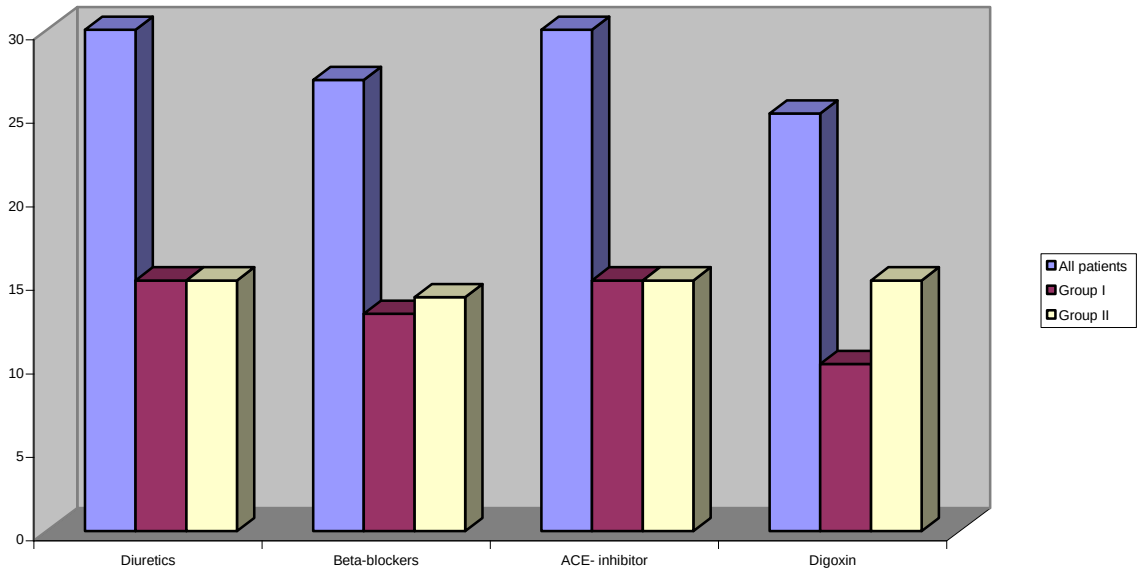


Figure(8); functional class of studied patients

Table (12) Medications used by studied patients

	All patients	Group I	Group II
Diuretics	30	15	15
Beta-blockers	27	13	14
ACE- inhibitor	30	15	15
Digoxin	25	10	15

Among study population, all patients received diuretics &ACE-inhibitor.27 patients(90%) received Beta-blockers,25 patients (83%) received digoxin**.**



Figure(9); Medications used by studied patients

Table (13): comparison between group I and l group II after two hours

GROUPS / Variables	Group I		Group II		t	p
	mean	sd	mean	sd		
SBP	128.47	16.44	125.2	21.86	0.65	>0.05
HR	77	8.22	84.67	10.79	٠,٣٧	>0.05
LVEF	٣٧,٦٠	٤,٥٤	39.66	٧,٦٢	٠,١	>0.05

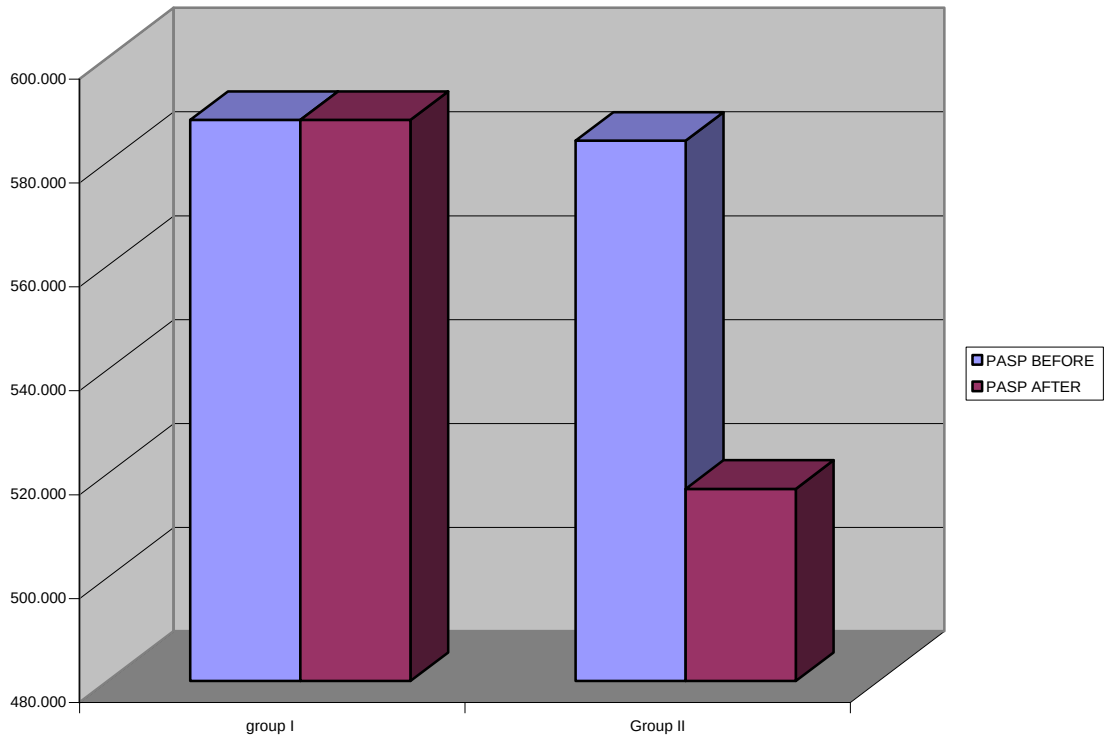
As regard SBP there was a reduction from 133.27 to 128.47 in group I versus a decrease from 130.67 to 125.2 in group II with no significant value .

As regard HR there was a change in group I from 78.4 to 77 versus a change from 78.8 to 84.67 in group II with no significant value .

Table (14): comparison between group I and group II as regards to PASP

GROUP / variables	Group I		Group II		t	p
	mean	Std.Deviation	mean	Std.Deviation		
PASP before	58.80	9.90	58.40	10.62	0.1	>0.05
PASP after 2 hours	58.20	9.960	51.70	8.50	2.01	* <0.05

As regard PASP , There was a reduction in PASP from mean 58.40 before administration of sildenafil to 51.700 after use of it with no significant reduction in the first group who received standard therapy .



Figure(10); PASP by ECHO in studied groups before and after

Table (15): comparison between group I and group II Baseline Maximal cardiopulmonary Exercise Test parameters

:

groups / variables	Group I Number is 15		Group II Number is 15		T	P
	mean	SD	mean	SD		
VE peak, |L/min	49.40	8.09	49.93	8.17	0.8	>0.05
Vo2 peak, ml/kg/ min	19.47	3.44	19.20	4.16	0.2	>0.05
VCo2 peak, L/min	19.80	3.49	17.53	2.29	2.1	<0.05
VE/vco2 slope	45.15	4.11	39.85	5.30	3.6	<0.05
T ½ VE (min)	2.51	0.64	2.19	0.34	1.7	>0.05
T ½ Vo2 (min)	2.57	0.52	2.01	0.33	3.5	<0.05
T ½ Vco2 (min	2.45	0.73	2.20	0.29	2.3	<0.05

As regard minute ventilation, it was 49.4 in group I versus 49.93 in group II. As regard Vo2 peak it was 19.47 in group I versus 19.20 in group II, VCo2 peak, L/min was 19.80 in group I and 17.53 in group II .

As regard VE/vco2 slope it was 45.15 in group I versus 39.85 in group II , As regard T ½ VE it was 2.51 in group I and 2.19 in group II , for **T** ½ Vo2 it was 2.57 in group I and 2.01 in group II .

As regard **T** ½ Vco2 It was 2.45 in group I and 2.20 in group II .

Table (16): comparison between group I and group II Maximal cardiopulmonary Exercise Test parameters: after 2 hours

groups / variables	Group I Number is 15		Group II Number is 15		T	P
	mean	SD	mean	SD		
VE peak, |L/min	50.10	8.24	٥١,٥٣	٨,٠٨	2.2	<0.05
Vo2 peak, ml/kg/ min	20.00	3.39	٢٠,٨٧	٤,٢٤	2.4	<0.05
VCo2 peak, L/min	19.87	3.20	١٦,٢	٢,٧٣	2.1	<0.05
VE/vco2 slope	45.97	3.79	٣٦,٤٨	٢,٧٣	5.5	<0.05
T ½ VE (min)	2.47	0.55	١,٩٩	٠,٢٧	1.1	>0.05
T ½ Vo2 (min)	2.63	0.55	١,٨٧	٠,٣١	3.7	<0.05
T ½ Vco2 (min	2.44	0.74	١,٨٢	0.28	2.1	<0.05

After two hour of sildenafil use there was an improvement in group II in minute ventilation from 49.93to 51.53with p value <0.05 .

As regard Vo2 peak, ml/kg/ min there was an improvement from 19.20 to 20.87 with p value <0.05 .

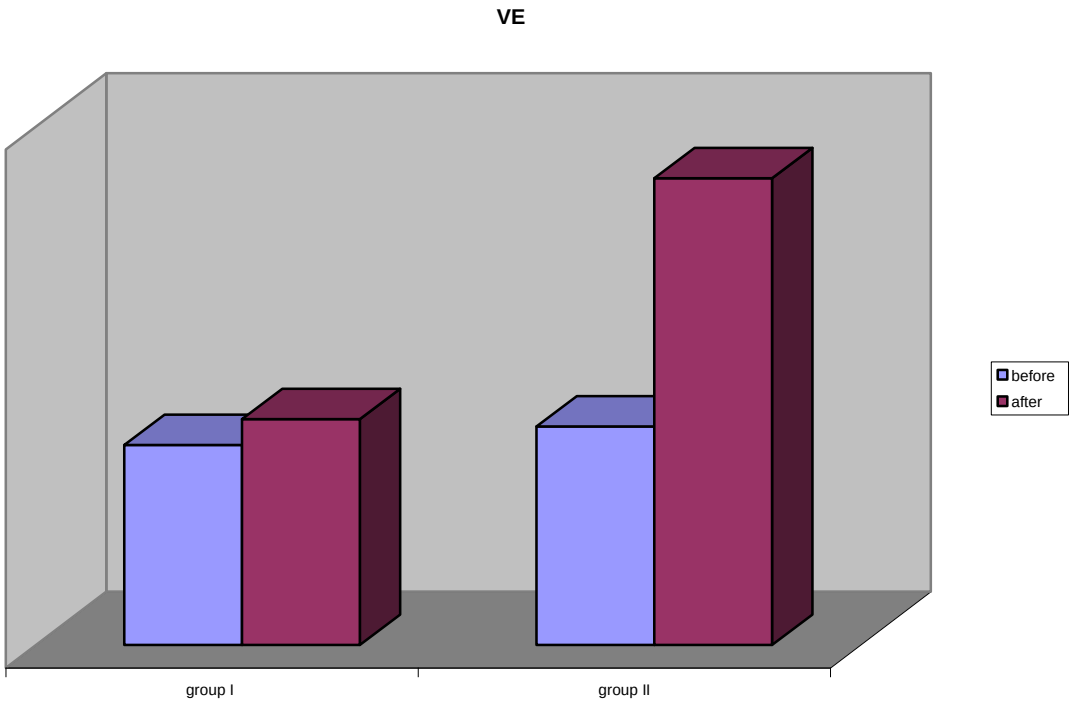
as regard VCo2 peak, L/min there was a reduction from 17.53 to 16.20 .as regard VE/vco2 slope there was an improvement from 39.85 to

36.48 with significant p value (<0.05) .

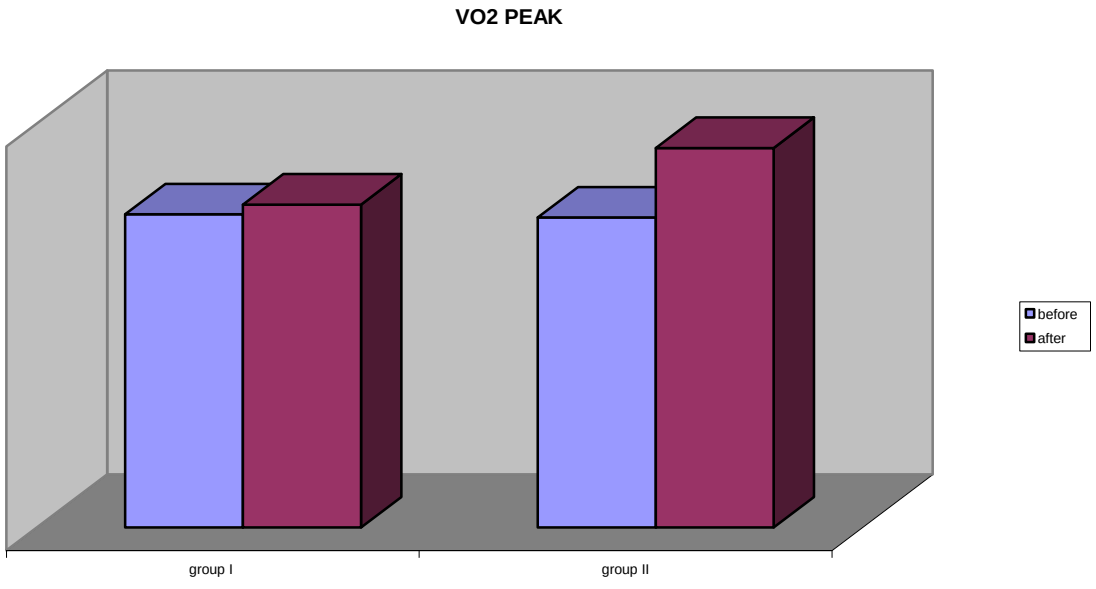
there was an improvement in **T** ½ VE(min) from 2.19 to 1.99 , for both **T** ½ Vo2 and **T** ½ Vco2 (min) there was improvement from 2.00 and 2.0 to 1.87 and 1.82

Table (17): comparison between group II before and after two hours

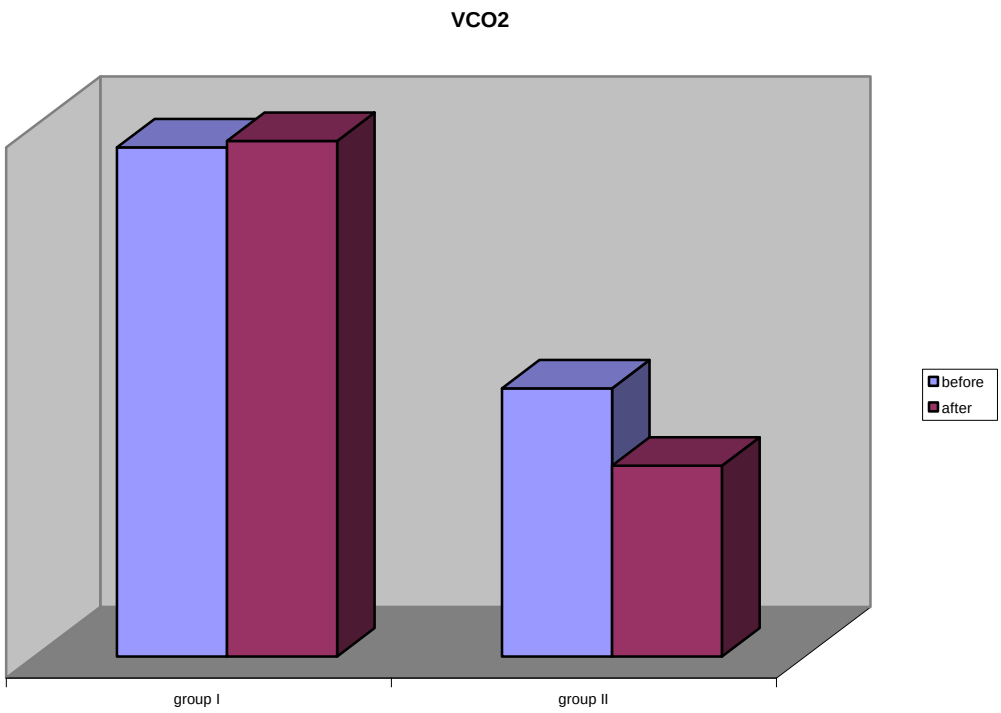
groups / variables	Group II before		Group II after		T	P
	mean	SD	mean	SD		
VE peak, |L/min	٤٩,٩٣	٨,١٧	٥١,٥٣	٨,٠٨	٢,١٤	<0.05
Vo2 peak, ml/kg/ min	١٩,٢	٤,١٦	٢٠,٨٧	٤,٢٤	٢,١	<0.05
VCo2 peak, L/min	١٧,٥٣	٢,٢٩	١٦,٢	٢,٧٣	٢,١	<0.05
VE/vco2 slope	٣٩,٨٥	٥,٣٠	٣٦,٤٨	٣,٢٤	٢,١	<0.05
T ½ VE (min)	٢,١٩	٠,٣٤	١,٩٩	٠,٢٧	٢,١	<0.05
T ½ Vo2 (min)	٢,٠٠	٠,٣٣	١,٨٧	٠,٣١	٢,١٤	<0.05
T ½ Vco2 (min	٢,٠	٠,٢٩	١,٨٢	0.28	٢,١	<0.05



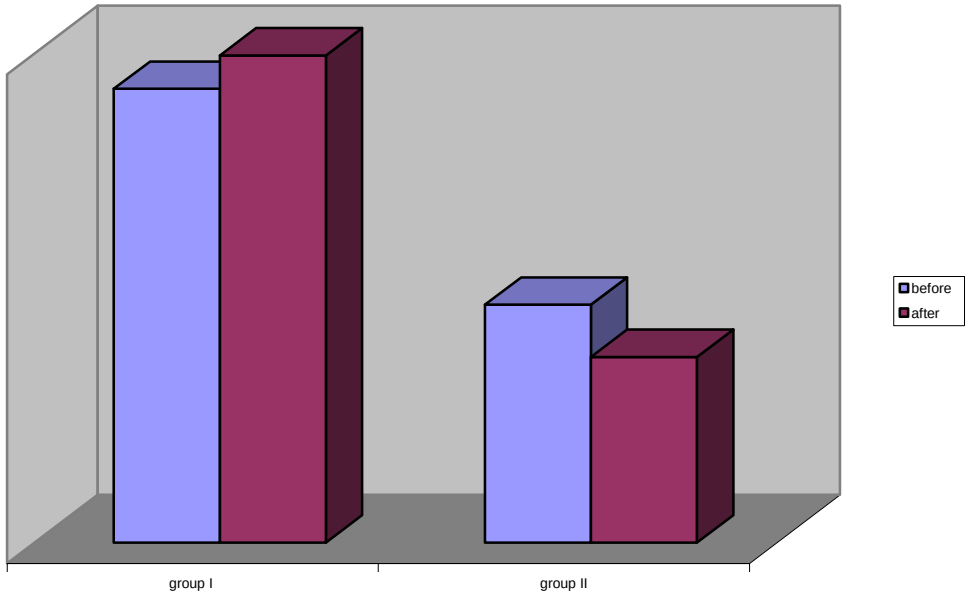
Figure(1١); comparing VE before and after use of sildenafil



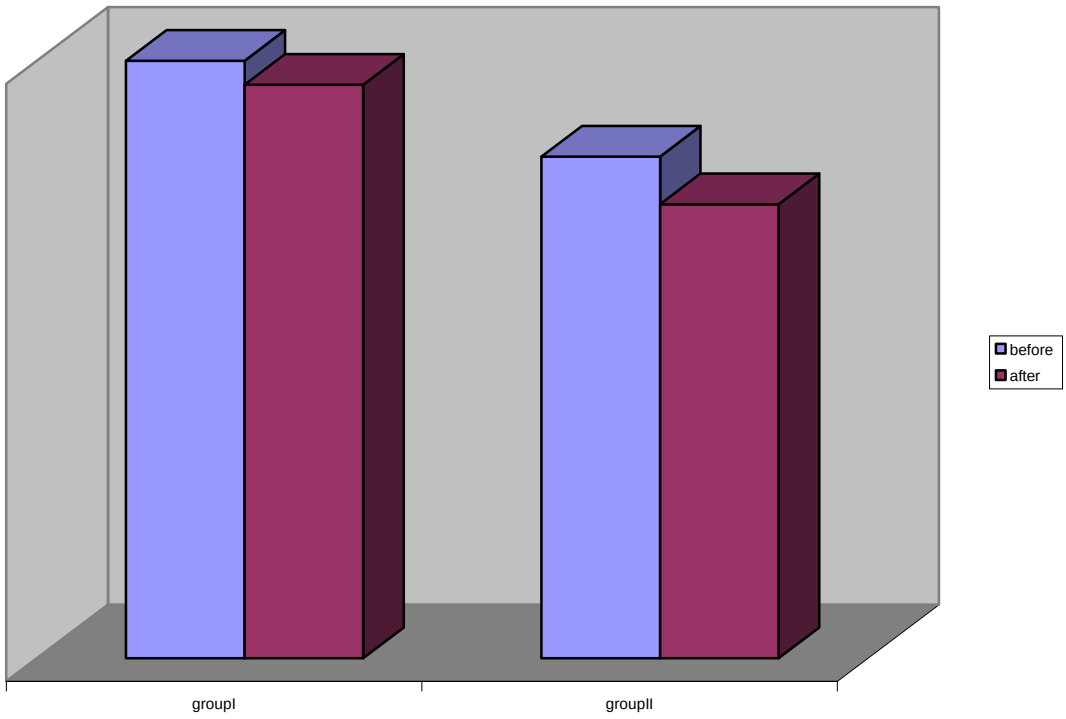
Figure(12); comparing peak vo2 before and after use of sildenafil



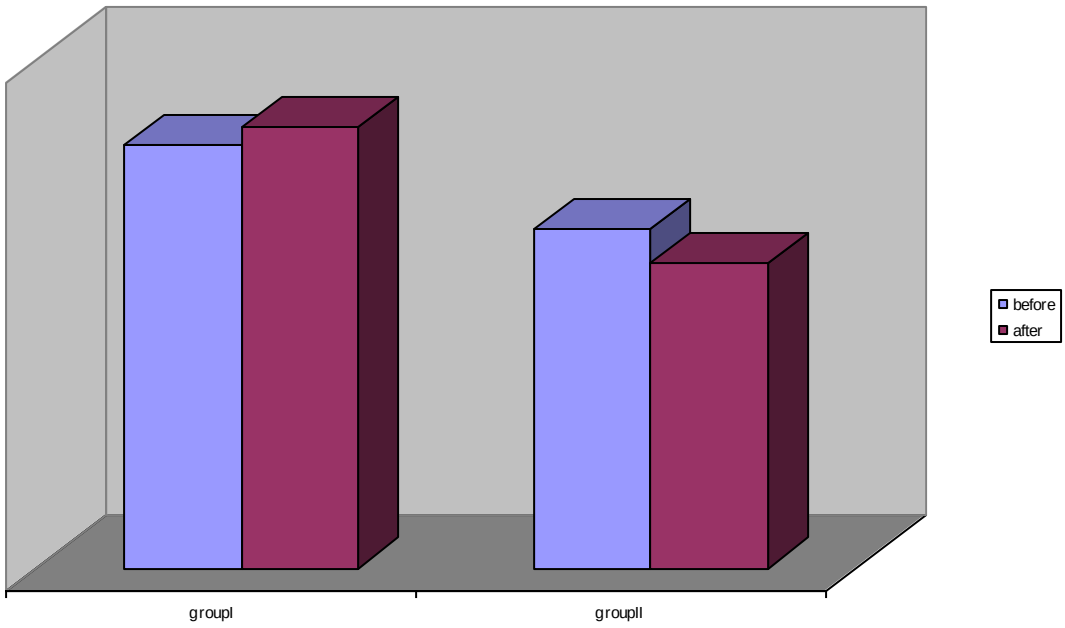
Figure(13); comparing peak vCo2 before and after use of sildenafil



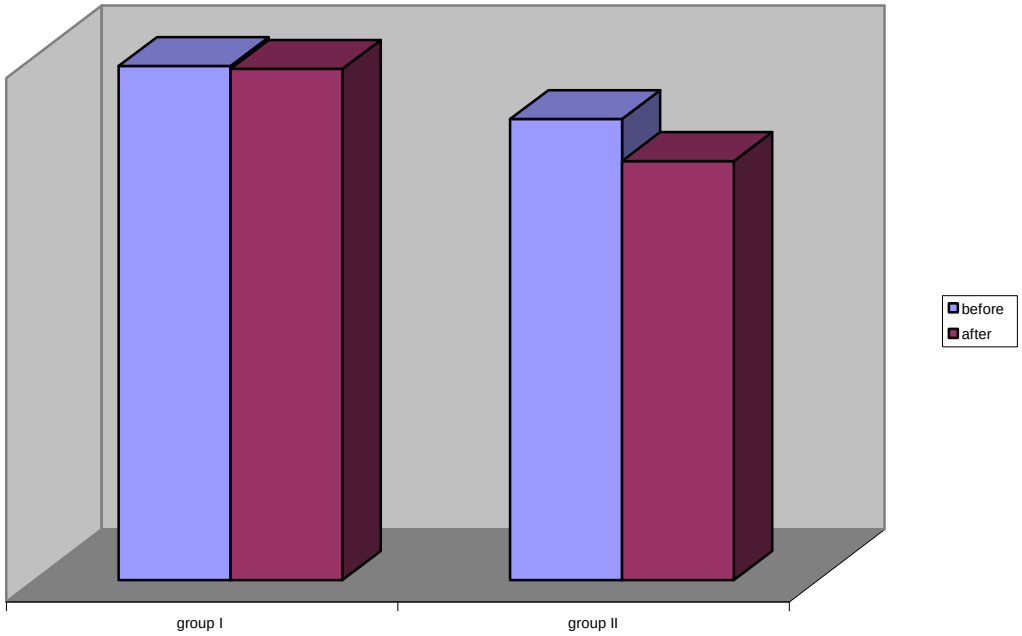
Figure(14); comparing VE/vco2 slope before and after use of sildenafil



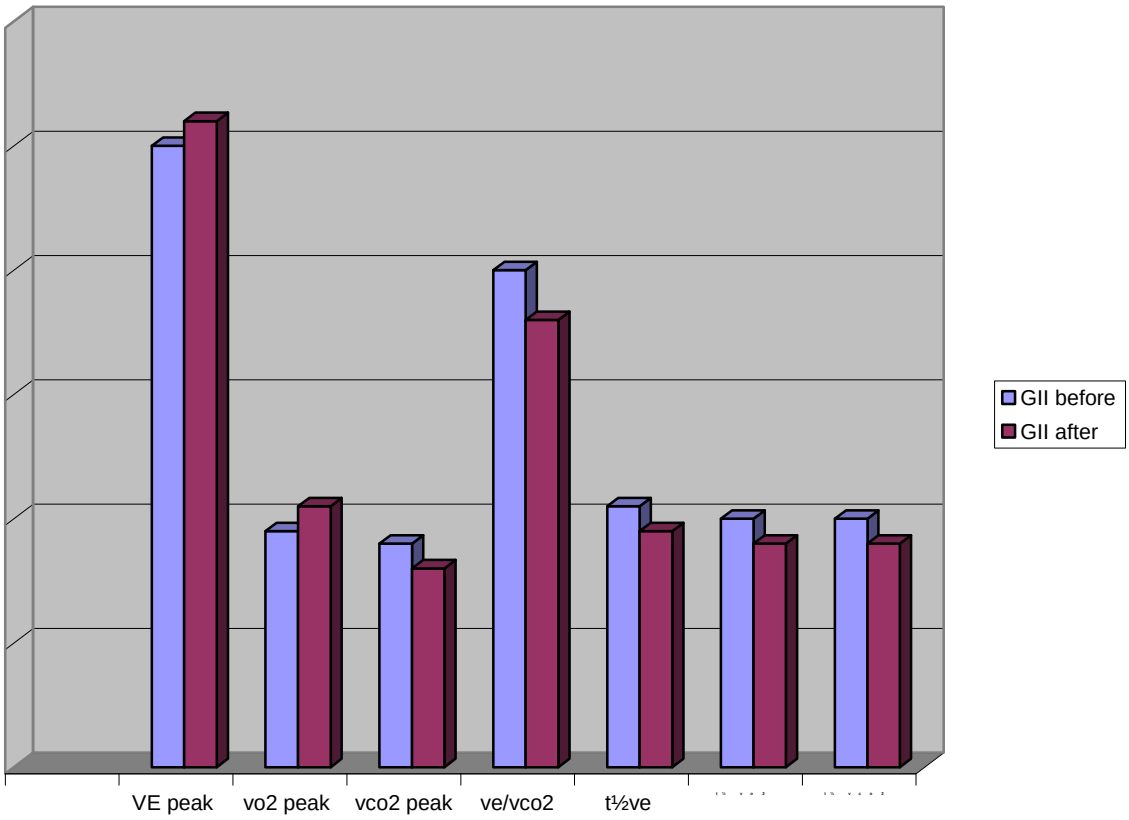
Figure(15); comparing T ½ VE before and after use of sildenafil



Figure(16); comparing T ½ VO2 before and after use of sildenafil



Figure(17); comparing T ½ VCO2 **before and after use of sildenafil**

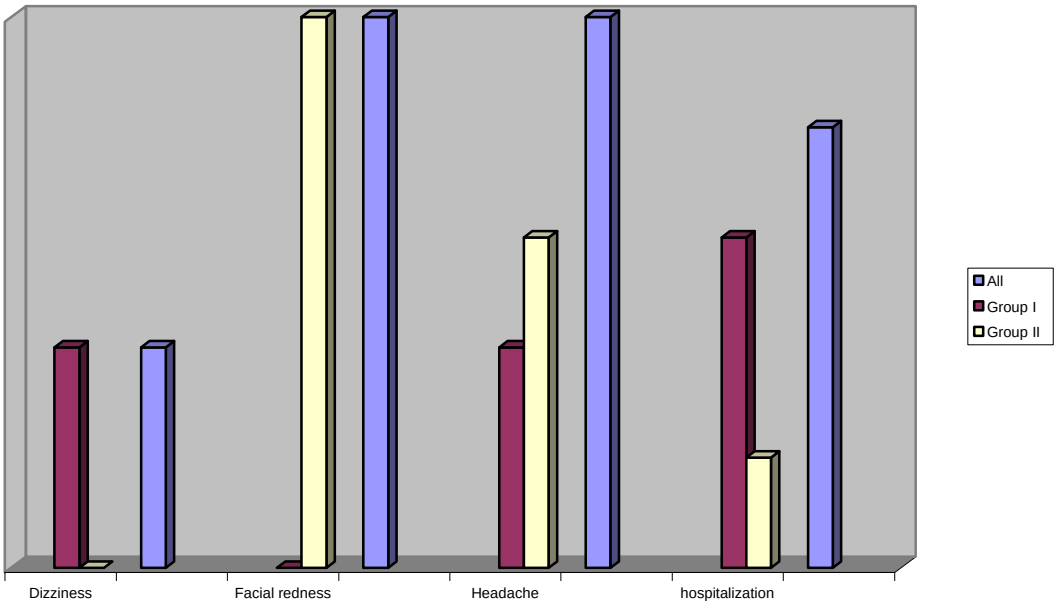


Figure(18); comparison between group II before and after two hours

Table (18) side effects that occurred during study

	All	Group II	Group I
Dizziness	٢	٠	٢
Facial redness	٥	٥	٠
Headache	٥	٣	٢
hospitalization	٤	١	3

Table 18 show the events that occurred during the study , it shows that two patients in group I had Dizziness versus one in group II , while five patients in group II had facial redness , as regard the headache , 3 patient in group II suffer from headache versus two patients in group I , while four patients had been hospitalized , 3 from group I and one from group II .



Figure(19); side effects that occurred during study