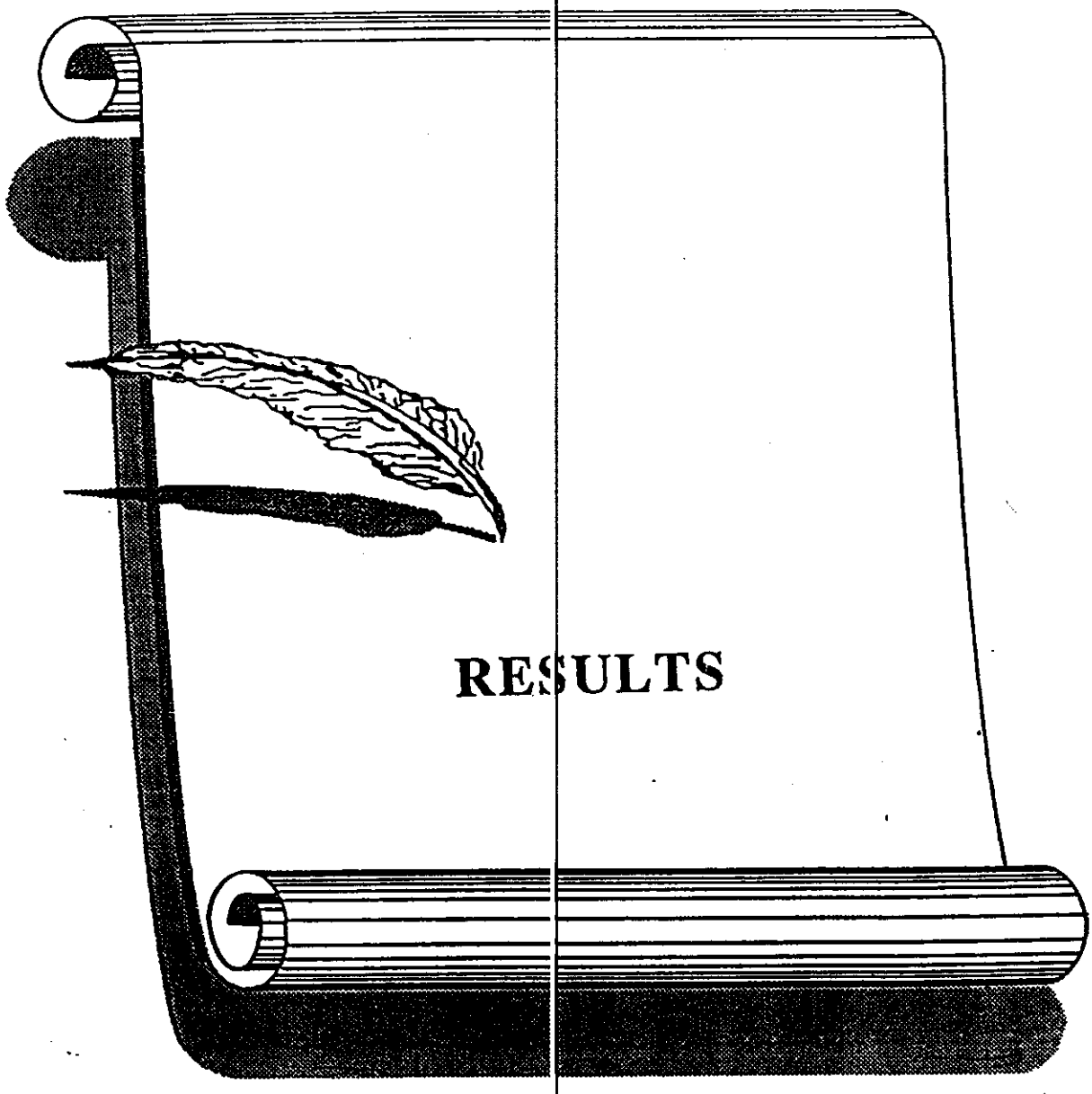

RESULTS

RESULTS

The results of the present study are presented (from Table 2 to Table 13) and in the figures (from figure 2 to figure 7).

Table (2) shows the mean value, standard deviation and p value of fasting blood glucose and 2 hour pp blood glucose in the studied groups.

In group I the mean value of F.B.S. was 136.2 ± 7.75 mg/dL. and that of 2 hour pp blood glucose was 157.1 ± 90.1 mg/dL

In group II the mean value of FBS was 92.6 ± 7.4 mg/dL and that of 2 hour pp blood glucose was 99.2 ± 22.5mg/dL.

In group III the mean value of FBS was 118.9 ± 48.1 mg/dL and that of 2 hour pp blood glucose was 142.1 ± 68.1 mg/dL.

In the reference group (group IV) the mean value of FBS was 91.1 ± 13.5mg/dL and that of 2 hour pp blood glucose was 101.2 ±12.9mg/dL.

Table (3) shows the mean value, standard deviation and p value of blood urea nitrogen (BUN), serum creatinine and serum uric acid in the studied groups .

In group I the mean value of BUN was 13.7± 3.3mg/dL the mean value of serum creatinine was 0.91 ± 0.1mg/dL and the mean value of serum uric acid was 5.5± 2.4 mg/dL.

In group II the mean value of BUN was 14.3 ± 2.5mg/dL the mean value of serum creatinine was 0.90 ± 0.2mg/dL and the mean value of serum uric acid was 4.8 ±1.3mg/dL.

In group III the mean value of BUN was 13.2±1.9mg/dL, the mean value of serum creatinine was 0.8±0.2 mg/dL and the mean value of serum uric acid was 5.5 ±2.1mg/dL.

In the reference group (group IV) the mean value of BUN was 12.9 ± 4.1mg/dL, the mean value of serum creatinine was 0.8±0.1mg/dL and the mean value of serum uric acid was 3.4 ± 0.6 mg/dL

Table (4) shows the mean value, standard deviation and p value of serum Na^+ and K^+ in the studied groups.

In group I the mean value of serum Na^+ was 139.1 ± 2.8 mmol/L. and the mean value of serum K^+ was 3.9 ± 0.2mmol/L.

In group II the mean value of serum Na^+ was 140.6 ± 3.8mmol/L. and the mean value of serum K^+ was 4.0 ±0.3 mmol/L.

In group III the mean value of serum Na^+ was 139.6 ± 3.1 mmol/L. and the mean value of serum K^+ was 3.9 ± 0.3 mmol/L.

In the reference group (group IV) the mean value of serum Na^+ was 138.8 ± 2.3 mmol/L. and the mean value of serum K^+ was 4.1± 0.3mmol/L.

Table (5) shows the mean value, standard deviation and p value of serum total cholesterol and triglycerides in the studied groups.

In group I the mean value of serum total cholesterol was 215.1± 59.5mg/dL. and the mean value of serum triglycerudes was 147.7± 49.2mg/dL.

In group II the mean value of serum total cholesterol was 163.4 ±25.8 mg/dL. and the mean value of serum triglycerudes was 123.7± 28.2mg/dL.

In group III the mean value of serum total cholesterol was 190.9 ± 37.3 mg/dL. and the mean value of serum triglycerides was 183.2±103.6mg/dL.

In the reference group (group IV) the mean value of serum total cholesterol was 153.6± 32.6mg/dL. and the mean value of serum triglycerides was 108.3±29.1mg/dL.

Table (6) shows the mean value, standard deviation and p value of serum LDL- c and HDL-c in the studied groups.

In group I the mean value of serum LDL- c was 133.1 ± 46.9 mg/dL. and the mean value of serum HDL-c was 48.6 ± 16.2mg/dL.

In group II the mean value of serum serum LDL- c was 106.6 ±31.4 and the mean value of serum HDL-c was 58.0±14.4mg/dL.

In group III the mean value of serum LDL- c was 113.1 ± 27.4 mg/dL. and the mean value of serum HDL-c was 47.2 ±13.7mg/dL.

In the reference group (group IV) the mean value of serum LDL- c was 93.2 ±25.7mg/dL. and the mean value of serum HDL-c was 60.3± 6.1mg/dL.

Table (7) shows the mean value, standard deviation and the p value of lipid risk ratio $\left[\frac{\text{LDL c}}{\text{HDL c}}\right]$ in the studied groups.

In group (I) the mean value of lipid risk ratio was 2.9 ± 1.3.

In group (II) the mean value of lipid risk ratio was 1.7 ±0.2.

In group (III) the mean value of lipid risk ratio was2.5± 1.0.

In the reference group the mean value of lipid risk ratio was 1.9± 0.6.

Table (8) shows the mean value, standard deviation and the p value of plasma renin activity (PRA) in the studied groups.

In group I the mean value of PRA was 2.8±1.6 ng/ml/hr.

In group II the mean value of PRA was 4.7±1.5ng/ml/hr.

In group III the mean value of PRA was 2.1± 1.5ng/ml/hr.

In group IV the mean value of PRA was 1.5± 0.6ng/ml/hr.

N.B.

P_1 represent statistical significance between group I and III.
P_2 represent statistical significance between group II and I.
P_3 represent statistical significance between group II and III.
P_4 represent statistical significance between group I and II, III and controls.

Table (9) shows the mean value, standard deviation and the p value of plasma angiotensin II in the studied groups.

In group I the mean value of plasma Angiotensin II was 17.3 ±5.1 pg/ml.

In group II the mean value of plasma Angiotensin II was 26.0 ± 5.3pg/ml

In group III the mean value of plasma Angiotensin II was 13.8 ±4.8pg/ml

In the reference group the mean value of plasma Angiotensin II was 9.7±4.8p g/ml

Table (10) shows the mean value, standard deviation and the P value of Angiotensin converting enzyme activity (ACE) in the studied groups.

In group I the mean value of ACE was 65.5 ± 16.4 unit.

In group II the mean value of ACE was 78.9±19.2unit.

In group III the mean value of ACE was 56.8±19.6unit.

In the reference group the mean value of ACE was 44.4±7.9unit.

Table (11) shows the mean value, standard deviation and the P value of PRA, AII and ACE activity in severe cases of IHD and other case of IHD.

In severe cases of IHD, the mean value of PRA was 5.6 ± 1.7 ng/ml/hr the mean value of AII was 26.2±5.9 pg/ml and the mean value of ACE was 82.5±19.9 unit.

In other cases of IHD, the mea value of PRA was 2.2±1.3 ng/ml/hr the mean value of AII w s 16.8± 6.0 pg/ml and the mean value of ACE activity was 64.3 ±14.4 unit.

Table (12) shows correla tion coeffiecient (r) and probability value (P) between the d velopment of IHD and PRA, AII, ACE and LDL-c in the studied groups.

The r value between development of IHD and PRA was +0.470.

The r value between development of IHD and AII was +0.575.

The r value between development of IHD and ACE was +0.452.

The r value between development of IHD and LDL-c was +0.214.

Table (13) shows regressi n variables related to the development of IHD.

Regression coefficient value o AII was + 0.0391

Regression coefficient value o LDL-C was+ 0.0026.

Figure (2) shows plasma renin activity among the studied groups.

Figure (3) shows plasma Angiotensin II among the studied groups.

Figure (4) shows Angioten in converting enzyme activity among the studied groups.

Figure (5) shows relationship between PRA and the development of IHD among the studied groups.

Figure (6) shows relationship between AII and the development of IHD among the studied groups.

Figure (7) Shows relationship between ACE activity and the development of IHD among the studied groups.

Table (2) Blood glucose level among the studied groups

Blood glucose level / Studied groups	Fasting blood glucose mg / dl			2 hr p.p blood glucose mg / dl		
	$\bar{X} \pm S.D$	versus control		$\bar{X} \pm S.D$	versus control	
		t	p		t	p
group I n = 30	136.2 ± 75.5	2.279	<0.05	157.1 ± 90.1	2.374	<0.05
group II n = 20	92.6 ± 7.4	0.411	>0.05	99.2 ±22.5	0.316	>0.05
group III n = 30	118.9 ± 48.1	2.181	<0.05	142.1 ± 68.1	2.291	<0.05
group Iv n = 15 (Controls)	91.1 ± 13.5	-	-	101.2 ±12.9	-	-

This table shows a statistically significant increase of FBS and 2hpp blood glucose in group I and group III when compared with control group.

However there is no significant change between group II and control group.

group I : IHD with risk factor.

group II : IHD without risk factors

group III : Risky group.

group IV : Control group.

Table (3) : Blood Urea Nitrogen, Serum creatinine and serum Uric acid among the studied groups

Studied groups	BUN mg/dl			Serum creatinine mg/dl			Serum Uric acid mg/dl		
	X± S.D.	versus controls		X± S.D	versus controls		X±S.D.	versus controls	
		t	P		t	P		t	P
Group I n=30	13.7±3.3	0.706	>0.05	0.91±0.4	1.513	>0.05	5.5±2.4	1.853	<0.05
Group II n=20	14.3±2.5	1.230	>0.05	0.90±0.21	0.955	>0.05	4.8±1.3	1.279	>0.05
Group III n=30	13.2±1.9	0.262	>0.05	0.88±0.21	0.681	>0.05	5.5±2.1	2.176	<0.05
Group IV n=15	12.9±4.1	-	-	0.84±0.13	-	-	4.3±2.1	-	-

This Table shows that there is no statistical significant change of BUN and seum creatinine among the studied groups. However there is astatistically significant increase of seum uric acid in group I and group III when compared with the control group and there is no statistically significant change between group II and control group .

Table (4) : Serum electrolytes level among the studied groups.

Serum electro-lytes / Studied groups	Serum Sodium mmol/ L			Serum Potassium mmol/ L		
	$\bar{X}$ ± S.D	versus control		$\bar{X}$ ± S.D	versus control	
		t	p		t	p
group I n = 30	139.1 ± 2.8	0.388	>0.05	3.9± 0.2	1.579	>0.05
group II n = 20	140.6 ± 3.8	1.269	>0.05	4.0 ±0.3	0.858	>0.05
group III n = 30	139.6± 3.1	0.914	>0.05	3.9 ± 0.3	1.495	>0.05
group Iv n = 15 (Controls)	138.8 ± 2.3	-	-	4.1 ± 0.3	-	-

This table shows that there is no statistically significant change of serum sodium and potassium in groups I, II and III when compared with the control group.

Table (5) : Serum Total cholesterol and triglycerides levels among the studied groups.

Serum lipids / Studied groups	Serum Total Cholesterol mg / dl			Srum Triglycerides mg / dl		
	$\bar{X} \pm$ S.D	versus control		$\bar{X} \pm$ S.D	versus control	
		t	p		t	p
group I n = 30	215.1 ± 59.9	3.694	<0.05	147.7±49.2	2.851	<0.05
group II n = 20	163.1 ± 25.8	0.991	>0.05	123.7 ±28.2	1.576	>0.05
group III n = 30	190.9 ± 37.3	3.295	<0.05	183.2 ±103.6	2.731	<0.05
group Iv n = 15 (Controls)	153.6 ± 32.6	-	-	108.3 ± 29.1	-	-

This table showes that there is a statistically significant increase of serum total cholesterol and serum triglycerides in group I and III when compared with control group. However there is no stastistically significant change between group II and control group.

Table (6) : Serum LDL- cholesterol and HDL- cholesterol levels among the studied groups .

Serum lipids / Studied groups	Serum LDL- cholesterol mg / dl			Serum HDL- cholesterol mg / dl		
	$\bar{X} \pm S.D$	versus control		$\bar{X} \pm S.D$	versus control	
		t	p		t	p
group I n = 30	133.1 ± 46.9	3.054	<0.05	48.6 ± 16.2	2.696	<0.05
group II n = 20	106.6 ± 31.4	1.338	>0.05	58.0 ± 14.4	0.587	>0.05
group III n = 30	113.1 ± 27.4	2.328	<0.05	47.2 ± 13.7	3.521	<0.05
group Iv n = 15	93.2 ± 25.7	-	-	60.3 ± 6.1	-	-

This table showes that there is a statistically significant increase of serum LDL- cholesterol and serum HDL- cholesterol in group I and III when compared with control group. However there is no statistically significant change between group II and control group.

Table (7) : Lipid risk ratio among the studied groups.

Risk ratio / Studied groups	$\bar{X}$	± S.D	Test of significance versus controls	
			t	p
group I n = 30	2.9	1.3	2.863	<0.05
group II n = 20	1.7	0.2	0.824	>0.05
group III n = 30	2.5	1.0	2.209	<0.05
group Iv n = 15	1.9	0.6	-	-

This table shows that there is a statistically significant increase of risk ratio in group I and group III when compared with control group.

However there is no statistical significant change between group II and the control group.

N.B. Lipid Risk ratio = $\frac{\text{LDL-c}}{\text{HDL-c}}$

Table (8) : Plasma Renin activity among the studied groups

Studied groups / PRA ng/ml/hr	group I n=30	groupII n=20	groupIII n=30	group IV n=15
$\bar{X}$ ± S.D.	2.8 1.6	4.7 1.5	2.1 1.5	1.5 0.6
P_1^t	1.760 <0.05			
P_2^t		4.050 <0.01		
P_3^t		6.005 <0.01		
P_4^t	3.149 <0.05	7.829 <0.01	1.724 <0.05	

This table shows a statistically significant increase of PRA in groups I, II and III when compared with the control group. Also in group I when compared with group III and in group II when compared with group I and group III.

P_1 : statistical significance between groupI and groupIII

P_2 : statistical significance between groupII and groupI

P_3 : statistical significance between groupII and groupIII

P_4 : statistical significance between groupI,II,III and controls

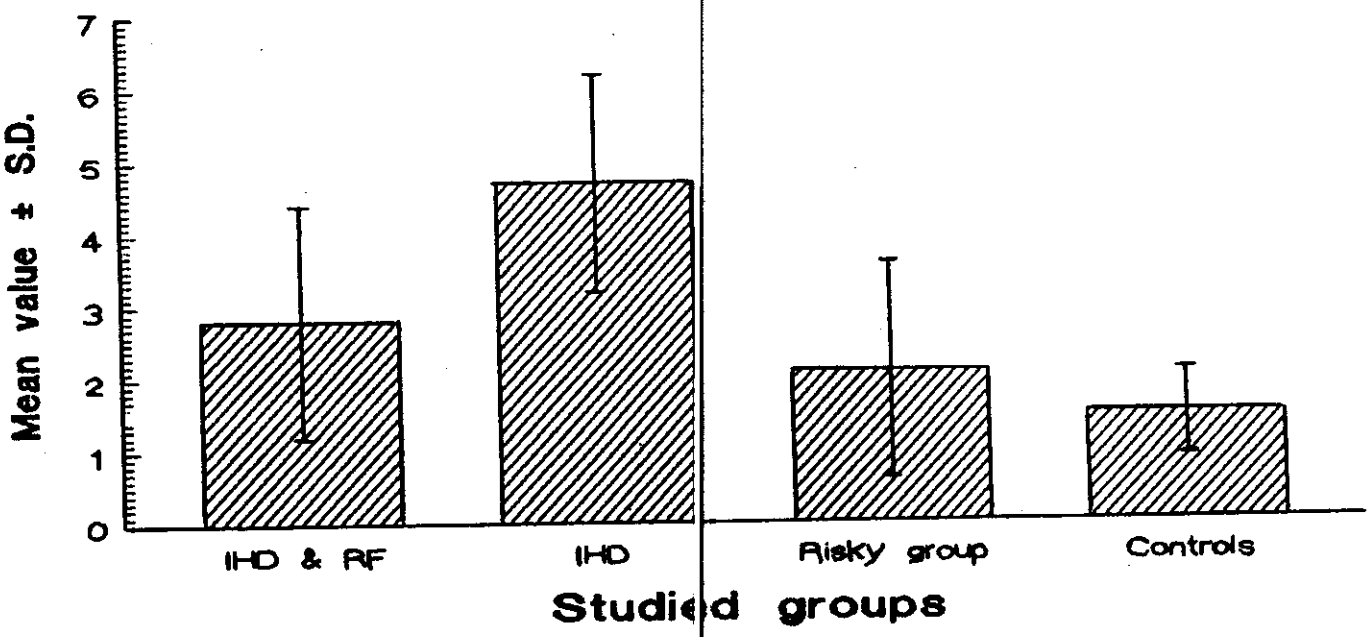

Fig. (2) : Plasma renin activity (PRA) among the studied groups.

Table (9) : Plasma Angiotensin II concentration among the studied groups.

Studied groups / A II pg/ml	group I n=30	groupII n=20	groupIII n=30	group IV n=15
$\bar{X}$ ± S.D.	17.3 5.1	26.0 5.3	13.8 4.8	9.7 4.8
t P_1	2.758 <0.05			
t P_2		5.857 <0.01		
t P_3		8.491 <0.01		
t P_4	4.830 <0.01	9.362 <0.01	2.720 <0.05	

This table shows a statistically significant increase of plasma angiotensin II in groups I, II and III when compared with the control group. Also in group I when compared with group III and in group I when compared with group I and group III.

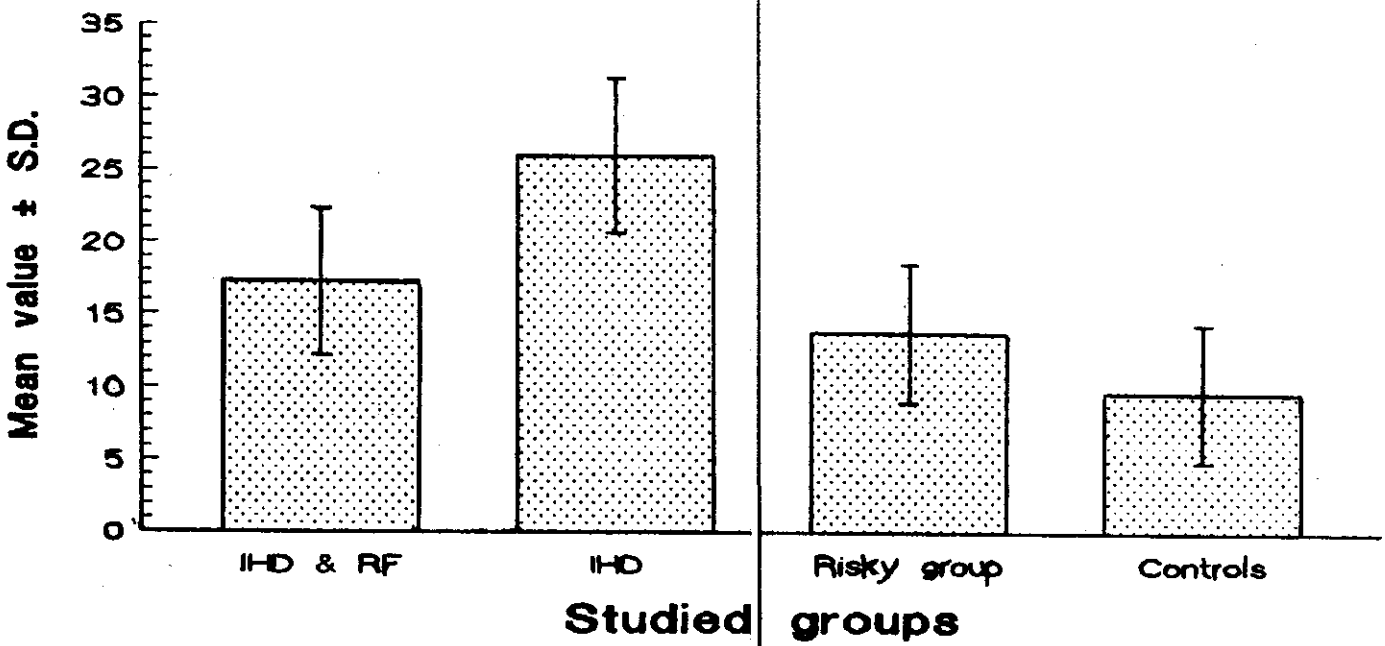

Fig. (3) : Plasma angiotensin II concentration among the studied groups.

Table (10) : Serum Angiotensin converting enzyme (ACE) activity among the studied groups.

Studied groups / ACE (unit)	group I n=30	groupII n=20	groupIII n=30	group IV n=15
$\bar{X}$ ± S.D.	65.5 16.4	78.9 19.2	56.8 19.6	44.4 7.9
t P_1	1.865 <0.05			
t P_2		2.645 <0.05		
t P_3		3.938 <0.01		
t P_4	4.702 <0.01	6.532 <0.01	2.347 <0.05	

This table shows a statistically significant increase of ACE in groups I, II and III when compared with the control group. Also in group I when compared with group III and in group II when compared with group I and group III.

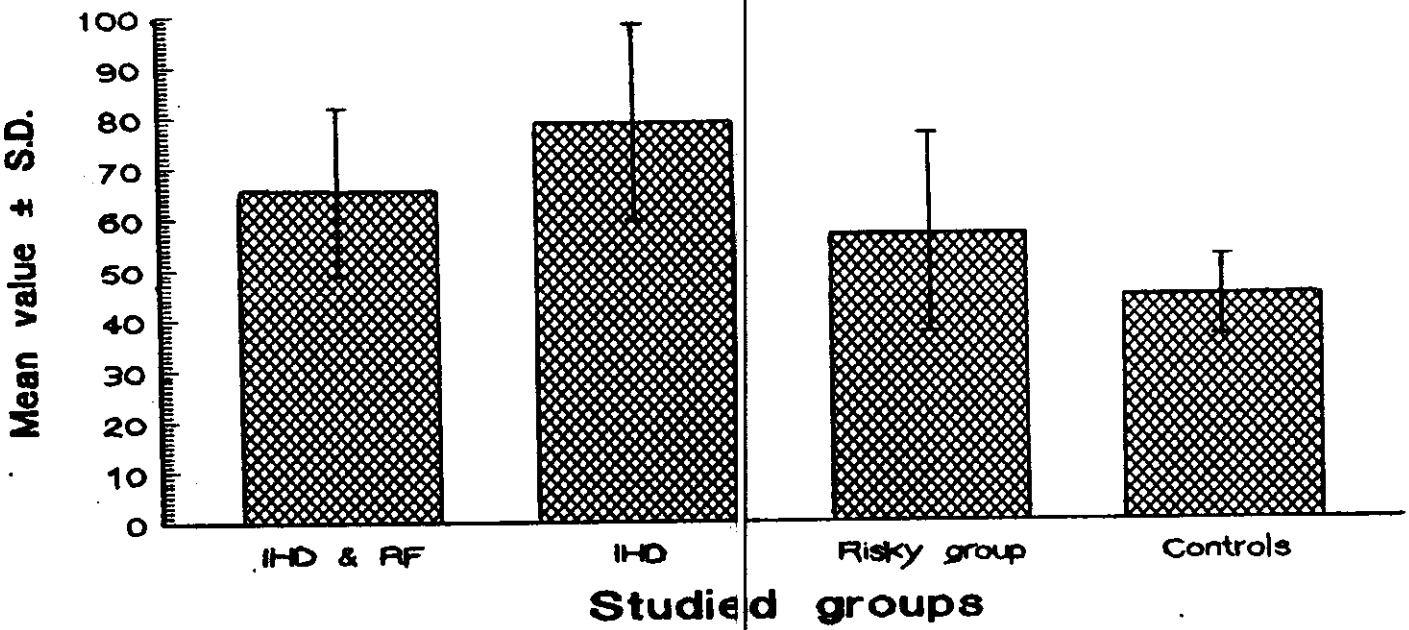

Fig. (4) : Angiotensin converting enzyme activity among the studied groups

Table (11) : Comparison between severe cases of IHD and other cases regarding plasma renin activity . Angiotensin II concentration and Angiotensin converting enzyme activity.

group / Variable	Severe cases of IHD N = 18	Other cases of IHD N = 32	t	p
	$\bar{X} \pm S.D$	$\bar{X} \pm S.D$		
- P.R.A. (ng/ml/hr)	5.6 ± 1.7	2.2 ± 1.3	7.725	<0.01
-Angiotensin II (Pg/ml)	26.2 ± 5.9	16.8 ± 0.6	5.265	<0.01
-ACE (unit)	82.5 ± 19.9	64.3 ± 14.4	3.717	<0.01

This table showes that there is a statistically significant increase of PRA, Angiotensin II and ACE in severe cases of IHD when compared with other cases of IHD.

Table (12) : Correlation coeffiecient (r) and probability value (p) between the development of IHD and plasma Renin activity (PRA), angiotensin II concentration, Angiotensin converting enzyme activity (ACE) and LDL-C

Variable	Development of IHD	
	r	P
- P.R.A. (ng/ml/hr)	+ 0.470	< 0.05
-Angiotensin II (Pg/ml)	+ 0.575	< 0.05
-ACE (unit)	+ 0.452	< 0.05
-LDL (mg/dl)	+ 0.214	< 0.05

This table shows + ve significant correlation between the development of IHD and PRA, Angiotensin II, ACE, and LDL-c.

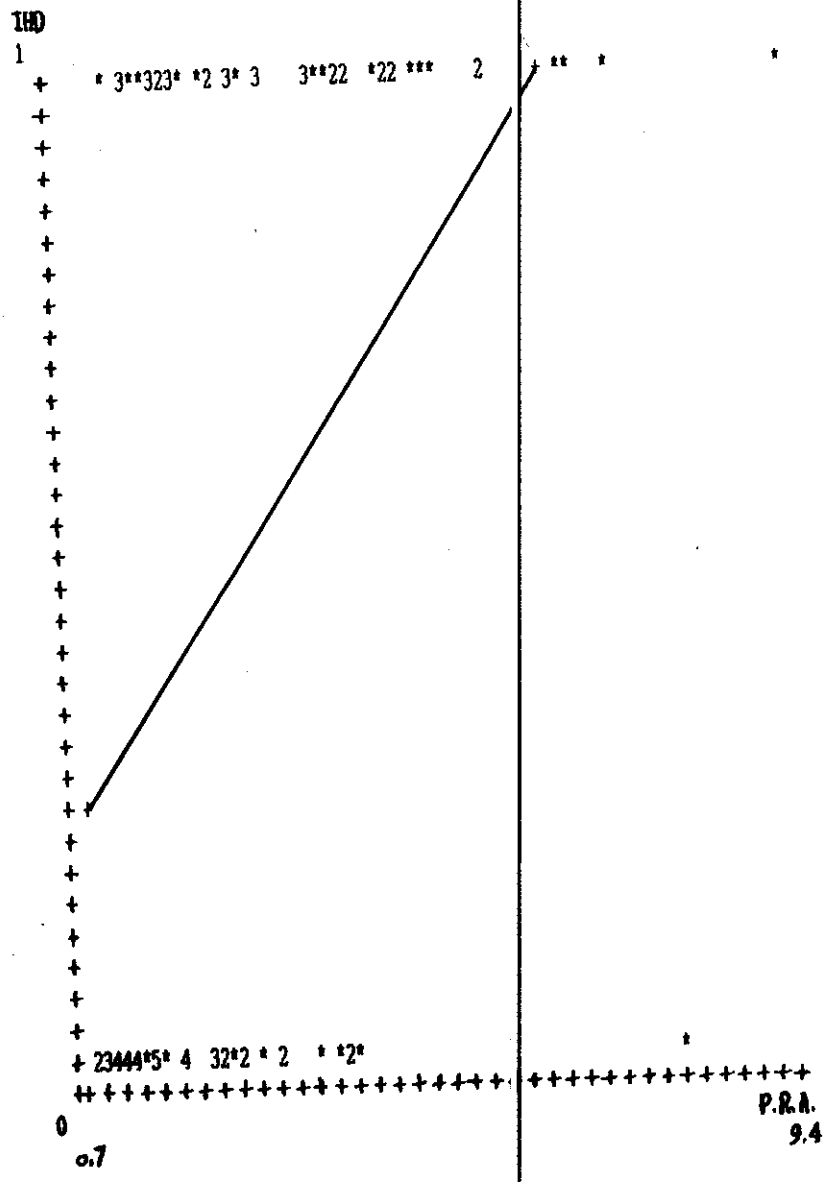

Fig. (5) :- Relationship between P.R.A. and the development of IHD among the studied groups.

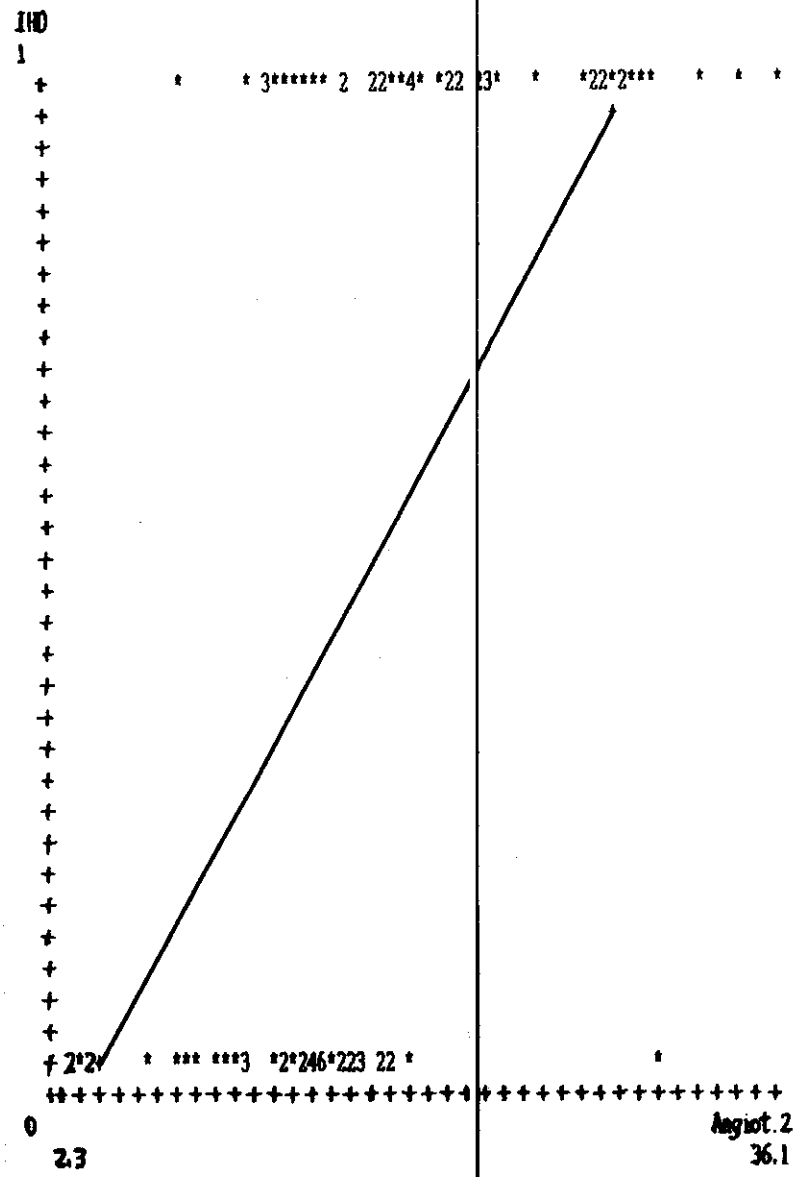

Fig. (6) : Relationship between angiotensin II and the development of IHD among the studied groups.

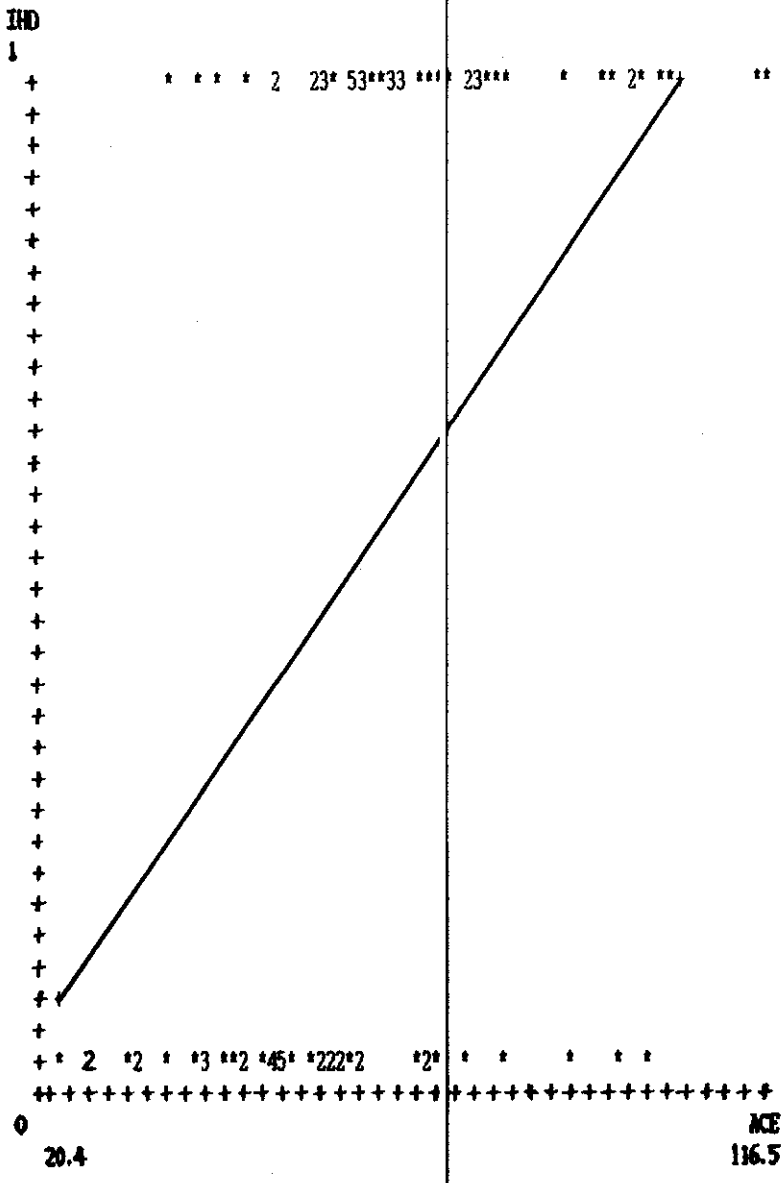

Fig. (7) : Relationship between ACE and the development of IHD among the studied groups.

Table (13) : Regression variables related to the development of IHD.

Variables	Development of IHD			
	Regression coefficient	STD. Error	F	P
-Angiotensin II (Pg/ml)	+ 0.0391	0.0057	47.296	<0.01
-LDL - c (mg/dl)	+ 0.0026	0.0011	5.672	<0.05
Constant	+ 0.4371	-	-	-

$R^2 = 0.6082$

This table clearly shows that the best predictors of develpment of IHD among the studied samples were Angiotensin II and LDL - c, However PRA and ACE were not be included in the regression equation .