

RESULTS

All the results of this work are represented in the accompanied tables and figures.

Statistical analysis of the results was performed using the "P" and the " T " (student) tests (Colton T., 1974; Hill A.B., 1979).

- 30 subjects were chosen for this study; 20 patients with coronary heart disease treated by beta-blockade, propranolol as non selective beta-blocker and Atenolol as selective beta-blockade and 10 subjects with normal E.C.G. as control group.
- 20 patients with coronary heart disease were classified into the following (Table 1).
- 9 patients with recent myocardial infarction (5 patients with recent anterior infarction, 2 patients with recent inferior infarction and 2 patients with subendocardial infarction).
- 6 patients with old myocardial infarction (4 patients with old anteroseptal infarction and 2 patients with old inferior infarction).

- 5 patients with myocardial ischemia (3 patients with subendocardial ischemia, one patient with inferior ischemia and one patient with inferolateral ischemia).
- The average age of all cases was 57.75 years.
- 9 patients denote the higher serum amylase (more than normal = 220 S.U./100 ml) but three of them denote sure hyperamylasemia (more than 300 S.U./100 ml).
- Two of the three cases with severe hyperamylasemia presented with epigastric pain, persistent vomiting and lowering in blood pressure without manifestation of the shock (Table 8).
- The average level of serum triglycerides (TG) in control group was 86.5 ± 24.39 mg/100 ml (Table 4).
- The average level of serum amylase in control group was 107 ± 27.61 S.U./100 ml (Table 4).
- The average level of serum non-esterified free fatty acid (FFA) was 8.34 ± 1.69 mg/100 ml (Table 4).

I- Propranolol (inderal) administration 120 mg/day for 2 weeks induced the following effects:

(1) Blood pressure.

- i- The mean value of systolic blood pressure before treatment was 159.5 ± 14.6 mm Hg, dropped to 143.5 ± 12.5 mm Hg after treatment, and this decrease is highly significant ($P < 0.05$ ~~***~~) table 3.
- ii- The mean value of diastolic blood pressure before treatment was 98 ± 11.6 mm Hg, dropped to 88 ± 10.3 after treatment and this decrease is significant ($P = 0.05$) table 3.

(2) Serum triglycerides:

The mean value of serum triglycerides before treatment was 130.7 ± 14.5 mg/100 ml, increased to 155 ± 28.6 mg/100 ml after treatment, and this increase is highly significant ($P < 0.05$ ~~***~~) table 6 fig.I.

(3) Serum amylase:

The mean value of serum amylase before treatment was 173.5 ± 39.7 S.U./100 ml, increased to 206.2 ± 45.2 S.U./100 ml after treatment, and this increase is significant ($P = 0.05$) table 6 fig.II.

(4) Serum free fatty acids:

The mean value of serum FFA before treatment was 19.96 ± 5.25 mg/100 ml, dropped to 18.6 ± 4.4 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$) table 6 fig. III.

II- Atenolol (Tenormin) administration 100 mg/day for 2 weeks induced the following effects.

(1) Blood pressure:

i- The mean value of systolic blood pressure before treatment was 171.5 ± 20.1 mm Hg, dropped to 137 ± 30.9 mm Hg after treatment, and this decrease is highly significant ($P < 0.05$ ~~***~~) table 3.

ii- The mean value of diastolic blood pressure before treatment was 106.5 ± 12.3 mm Hg, dropped to 87 ± 19.7 mm Hg after treatment, and this decrease is highly significant ($P < 0.05$ ~~**~~) table 3.

(2) Serum triglycerides:

The mean value of serum triglycerides before treatment was 131.6 ± 16.8 mg/100 ml, increased to

181.8 $\pm$ 42.9 mg/100 ml after treatment, and this increase is highly significant ($P < 0.05$ ~~xxx~~) table 6 fig. I.

(3) Serum amylase:

The mean value of serum amylase before treatment was 171.7 $\pm$ 49.2 S.U./100 ml, increased to 240 $\pm$ 82.7 S.U./100 ml after treatment, and this increase is highly significant ($P < 0.05$ ~~xxx~~) table 6 fig. II.

(4) Serum free fatty acids:

The mean value of serum FFA before treatment was 20.95 $\pm$ 4.9 mg/100 ml, dropped to 19.1 $\pm$ 4.9 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$) table 6 fig. III.

Comparison between serum triglycerides, serum amylase and serum FFA in control group and group I (inderal) (Table 4):

1- Serum triglycerides.

The mean value of serum triglycerides in control group was 86.5 $\pm$ 24.4 mg/100 ml. The mean value of serum triglycerides in group I before treatment was 130.7 $\pm$ 14.5 mg/100 ml, increased to 155 $\pm$ 28.6 mg/100 ml after treatment, and this increase before and after treatment is highly significant ($P < 0.05$ ~~xxx~~).

2- Serum amylase:

The mean value of serum amylase in control group was 107 ± 27.6 S.U./100 ml. The mean value of serum amylase in group I before treatment was 173.5 ± 39.7 S.U./100 ml, increased to 206.2 ± 45.2 S.U./100 ml after treatment, and this increase before and after treatment is highly significant ($P < 0.05$ ~~xxx~~).

3- Serum free fatty acids:

The mean value of serum FFA in control group was 8.34 ± 1.69 mg/100 ml. The mean value of serum FFA in group I before treatment was 19.96 ± 5.25 mg/100 ml, dropped to 18.6 ± 4.4 mg/100 ml after treatment, and this increase before and after treatment is highly significant ($P < 0.05$ ~~xxx~~).

Comparison between serum triglycerides, serum amylase and serum FFA in control group and group II (Tenormin)(Table 5):

1- Serum triglycerides:

The mean value of serum TG in control group was 86.5 ± 24.4 mg/100 ml. The mean value of serum TG in group II before treatment was 131.7 ± 16.8 mg/100 ml, increased to 181.8 ± 42.9 mg/100 ml after treatment, and this increase before and after treatment is highly significant ($P < 0.05$ ~~xxx~~).

2- Serum amylase:

The mean value of serum amylase in control group was 107 ± 27.6 S.U./100 ml. The mean value of serum amylase in group II before treatment was 171.7 ± 49.2 S.U./100 ml, increased to 204 ± 82.7 S.U./100 ml after treatment, and this increase before and after treatment is highly significant ($P < 0.05$ ~~***~~).

3- Serum free fatty acids:

The mean value of serum FFA in control group was 8.3 ± 1.69 mg/100 ml. The mean value of serum FFA in group II before treatment was 20.95 ± 4.9 mg/100 ml, dropped to 19.1 ± 4.4 mg/100 ml after treatment, and this increase before and after treatment is highly significant ($P < 0.05$ ~~***~~).

Comparison between male and female patients with coronary heart disease before and after treatment (Table 9):

1- Age:

The mean age of males was 58.3 ± 6.5 years.

The mean age of females was 56.5 ± 8.3 years.

2- Serum triglycerides:

The mean value of serum TG in males before treatment was 131.07 ± 16.23 mg/100 ml, increased to

167.98 $\pm$ 29.9 after treatment, and this increase is highly significant ($P < 0.05$ ~~***~~).

The mean value of serum TG in females before treatment was 131.4 $\pm$ 14.17 mg/100 ml, increased to 169.35 $\pm$ 56.5 mg/100 ml after treatment, and this increase is insignificant ($P > 0.05$).

3- Serum amylase:

The mean value of serum amylase in males before treatment was 168.8 $\pm$ 45.3 S.U./100 ml, increased to 219.97 $\pm$ 68.1 S.U./100 ml after treatment, and this increase is highly significant ($P < 0.05$ ~~***~~).

The mean value of serum amylase in females before treatment was 181.3 $\pm$ 41.44 S.U./100 ml, increased to 230.5 $\pm$ 70.6 S.U./100 ml after treatment, and this increase is insignificant ($P > 0.05$).

4- Serum free fatty acids:

The mean value of serum FFA in males before treatment was 21.02 $\pm$ 5.31 mg/100 ml, dropped to 19.13 $\pm$ 4.9 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$).

The mean value of serum FFA in females before treatment was 19.23 $\pm$ 4.39 mg/100 ml, dropped to

18.22 $\pm$ 3.85 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$).

Comparison between cases less than 60 years and cases greater than or equal 60 years (Table 7):

1- Serum triglycerides:

The mean value of serum TG in cases less than 60 years treated with inderal was 125.93 $\pm$ 11.6 mg/100 ml before treatment, increased to 175.43 $\pm$ 56.3 mg/100 ml after treatment, and this increase is significant ($P = 0.05$).

The mean value of serum TG in cases less than 60 years treated with tenormin was 117.6 $\pm$ 15.3 mg/100 ml before treatment, increased to 162.7 $\pm$ 44.28 mg/100 ml after treatment, and this increase is insignificant ($P > 0.05$).

The mean value serum TG in cases greater than or equal 60 years treated with inderal was 137.75 $\pm$ 17.05 mg/100 ml before treatment, increased to 155.85 $\pm$ 28.2 mg/100 ml after treatment, and this increase is insignificant ($P > 0.05$).

The mean value of serum TG in cases ≥ 60 years treated with tenormin was 141.03 $\pm$ 10.1 mg/100 ml

before treatment, increased to 194.5 ± 40.7 after treatment, and this increase is highly significant ($P < 0.05$ ~~***~~).

2- Serum amylase:

The mean value of serum amylase in cases < 60 years treated with inderal was 170.7 ± 47.7 S.U./100ml before treatment, increased to 202.25 ± 57.13 S.U./100 ml after treatment, and this increase is insignificant ($P > 0.05$).

The mean value of serum amylase in cases < 60 years treated with tenormin was 138.28 ± 51.83 S.U./100 ml before treatment, increased to 187.05 ± 96.62 S.U./100 ml after treatment, and this increase is insignificant ($P > 0.05$).

The mean value of serum amylase in cases ≥ 60 years treated with inderal was 177.6 ± 30.1 S.U./100ml before treatment, increased to 212.13 ± 24.46 S.U./100 ml after treatment, and this increase is insignificant ($P > 0.05$).

The mean value of serum amylase in cases ≥ 60 years treated with tenormin was 193.97 ± 35.22 S.U./100 ml, increased to 275.35 ± 54.54 S.U./100 ml after treatment, and this increase is highly significant ($P < 0.05$ ~~***~~).

3- Serum free fatty acids:

The mean value of serum FFA in cases < 60 years treated with inderal was 18.4 ± 4.49 mg/100 ml before treatment, decreased to 17.066 ± 2.86 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$).

The mean value of serum FFA in cases < 60 years treated with tenormin was 21.78 ± 6.49 mg/100 ml before treatment, decreased to 20 ± 5.36 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$).

The mean value of serum FFA in cases ≥ 60 years treated with inderal was 22.3 ± 6.13 mg/100 ml before treatment, decreased to 20.92 ± 5.8 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$).

The mean value of serum FFA in cases ≥ 60 years treated with tenormin was 20.4 ± 4.19 mg/100 ml before treatment, decreased to 18.5 ± 3.99 mg/100 ml after treatment, and this decrease is insignificant ($P > 0.05$).

TABLE (1): CLINICAL FINDING IN 20 PATIENTS WITH CORONARY HEART DISEASE UNDER BETA-BLOCKADE.

Case No.	Age in years	Sex	Blood pressure before	Blood pressure after	Frequency of chest pain	Location of coronary heart disease
1	62	♂	160/100	140/90	First time	Recent anterior infarction
2	60	♂	150/95	135/80	First time	Recent anteroseptal with lateral extension infarction
3	58	♂	140/90	80/50	Recurrent	Recent anteroseptal and old lateral infarction
4	63	♂	200/130	150/110	First time	Subendocardial infarction
5	40	♀	170/110	155/100	Recurrent	Inferior ischemia
6	70	♂	180/115	140/95	Recurrent	Old extensive anterior infarction
7	60	♀	150/90	135/80	Recurrent	Old inferior infarction and lateral ischemia
8	56	♀	145/90	135/85	Recurrent	Old inferior infarction and lateral wall ischemia
9	45	♂	160/85	140/75	First time	Recent anterior infarction
10	60	♀	150/100	85/55	First time	Recent inferior infarction
11	55	♂	170/110	155/105	Recurrent	Old anteroseptal infarction and lateral ischemia
12	59	♂	180/105	165/95	Recurrent	Subendocardial ischemia
13	56	♂	145/90	130/80	Recurrent	Recent inferior infarction and lateral ischemia
14	65	♂	170/110	140/100	Recurrent	Old anteroseptal infarction
15	58	♂	190/120	170/100	Recurrent	Old anterior lateral infarction
16	62	♀	160/90	140/80	First time	Subendocardial infarction
17	49	♂	140/90	130/80	First time	Recent extensive anterior infarction
18	53	♂	185/110	160/95	Recurrent	Extensive subendocardial ischemia
19	61	♀	175/100	155/90	Recurrent	Inferior lateral ischemia and old anteroseptal infarction
20	63	♂	190/115	165/100	First time	Subendocardial ischemia lateral wall
Mean	57.75		165.5/102.3	140/87		

TABLE(2): COMPARISON BETWEEN SERUM FREE FATTY ACID [FFA], TRIGLYCERIDES (TG) AND AMYLASE BEFORE AND AFTER INDICATION OF BETA-BLOCKADE (INDERAL AS NON SELECTIVE AND TENORMIN AS SELECTIVE BETA-BLOCKADE) IN 20 PATIENTS WITH CORONARY HEART DISEASE.

Case No.	Type of Beta-blockade	Before beta-blockade			After beta-blockade		
		FFA	TG	Amylase	FFA	TG	Amylase
1	Inderal	22.0	130.2	180.3	21.0	150.8	218.1
2	Inderal	31.0	160.1	135.1	29.1	160.3	180.2
3	Tenormin	25.2	110.9	200.9	23.0	217.0	327.9
4	Tenormin	19.1	123.3	225.0	19.0	160.1	280.0
5	Inderal	16.3	110.0	230.4	16.2	120.8	240.1
6	Tenormin	21.9	146.3	210.2	15.4	200.6	315.0
7	Inderal	17.2	140.5	205.0	16.6	190.3	239.3
8	Inderal	16.9	130.4	110.3	16.0	145.0	140.9
9	Inderal	24.0	123.8	150.2	20.1	145.3	150.4
10	Tenormin	28.0	148.1	190.9	26.0	270.9	354.0
11	Inderal	15.1	140.6	220.0	15.0	210.2	290.9
12	Tenormin	17.0	110.9	90.1	16.1	130.1	110.0
13	Tenormin	29.2	140.5	160.3	26.0	180.3	165.1
14	Tenormin	16.0	138.2	144.5	15.0	172.5	250.0
15	Inderal	14.1	115.9	135.1	14.0	169.9	211.2
16	Inderal	19.0	120.2	190.0	17.0	122.0	210.9
17	Inderal	24.2	134.9	178.2	21.1	135.8	180.0
18	Tenormin	15.7	108.1	101.8	14.9	123.2	145.2
19	Tenormin	18.0	139.0	161.2	17.5	167.1	197.5
20	Tenormin	19.4	151.3	232.0	18.1	195.9	255.6
Mean		20.48	131.16	172.575	18.855	168.41	223.115
S.D.		5.006	15.250	43.492	4.292	38.091	67.147
S.E.		1.119	3.410	9.7251	.9598	8.5174	15.015
T.					1.1021	-4.06	-2.825
P.					>0.05	*** <0.05	*** <0.05

TABLE (3): COMPARISON BETWEEN THE EFFECT OF PROPRANOLOL (INDERAL) & ATENOLOL (TENORMIN) ON BLOOD PRESSURE.

	GROUP I (INDERAL)				GROUP II (TENORMIN)			
	SYSTOLIC		DIASTOLIC		SYSTOLIC		DIASTOLIC	
	B.	A.	B.	A.	B.	A.	B.	A.
MEAN	159.5	143.5	98	88	171.5	137	106.5	87
S.D.	14.6	12.5	11.6	10.3	20.1	30.9	12.3	19.7
T.T.	2.632361		2.036532		2.955635		2.652932	
P	<0.05 ***		0.05		<0.05 ***		<0.05 ***	
SIG.	HIGHLYSIG.		SIG.		HIGHLYSIG.		HIGHLYSIG.	

TABLE (4): COMPARISON BETWEEN CONTROL GROUP & GROUP I (INDERAL).

		CONTROL GROUP	GROUP I B. TR.	GROUP I A. TR.
TG.	MEAN	86.5	130.66	155.04
	S.D.	24.3869	14.45977	28.63996
	T.T.		-4.92553	-5.76196
	P		<0.05***	<0.05***
AMYLASE	MEAN	107	173.46	206.2
	S.D.	27.60837	39.7477	45.1513
	T.T.		-4.34267	-5.92742
	P		<0.05***	<0.05***
FFA.	MEAN	8.34	19.96	18.6
	S.D.	1.693255	5.248746	4.43746
	T.T.		-6.66273	-6.83117
	P		<0.05***	<0.05***

B.TR.: BEFORE TREATMENT.

A.TR.: AFTER TREATMENT.

TABLE (5): COMPARISON BETWEEN CONTROL GROUP & GROUP II (TENORMIN).

		CONTROL GROUP	GROUP II B. TR.	GROUP II A. TR.
TG.	MEAN	86.5	131.66	181.77
	S.D.	24.3869	16.77314	42.96337
	T.T.		-4.82485	-6.09832
	P		<0.05***	<0.05***
AMYLASE	MEAN	107	171.72	204.03
	S.D.	27.60837	49.14513	82.72718
	T.T.		-3.63076	-4.8236
	P		<0.05***	<0.05***
FFA.	MEAN	8.34	20.95	19.1
	S.D.	1.693255	4.932039	4.36083
	T.T.		-7.64704	-7.27381
	P		<0.05***	<0.05***

B.TR.: BEFORE TREATMENT.

A.TR.: AFTER TREATMENT.

TABLE (6): COMPARISON BETWEEN GROUP I & GROUP II BEFORE & AFTER TREATMENT.

		GROUP I PROPRANOLOL (INDERAL)	GROUP II ATINOLOL (TENORMIN)
FFA.	B.	19.96 ± 5.248746	20.95 ± 4.932039
	A.	18.6 ± 4.437467	19.1 ± 4.360683
	T.T.	0.6257223	0.8886372
	P.	>0.05	>0.05
	SIG	NONSIG.	NONSIG.
TG.	B.	130.66 ± 14.45977	131.66 ± 16.77314
	A.	155.04 ± 28.63996	181.77 ± 42.96337
	T.T.	-2.403011	-3.435748
	P.	<0.05***	<0.05***
	SIG	HIGHLY SIG.	HIGHLY SIG.
AMYLASE.	B.	173.46 ± 39.74771	171.72 ± 49.14513
	A.	206.2 ± 45.15133	240.03 ± 82.72718
	T.T.	-1.735127	-2.244932
	P.	0.05	<0.05***
	SIG	SIG.	HIGHLY SIG.

B.: BEFORE

A.: AFTER

TABLE (7): COMPARISON BETWEEN CASES LESS THAN 60 YEARS
& CASES GREATER THAN OR EQUAL 60 YEARS.

		< 60 YEARS.		> = 60 YEARS.	
		INDERAL	TENORMIN	INDERAL	TENORMIN
FFA	B.	18.4±4.495	21.78±6.49	22.3±6.13	20.4±4.19
	A.	17.066±2.86	20±5.36	20.92±5.8	18.5±3.99
	T.T.	.6280086	.4215177	.3258853	.8044782
	P.	>0.05	>0.05	>0.05	>0.05
TG.	B.	125.93±11.62	117.6±15.32	137.75±17.05	141.03±10.1
	A.	175.43±56.28	162.65±44.28	155.85±28.15	194.52±40.73
	T.T.	-2.112076	-1.923024	-1.099832	-3.122056
	P.	0.05	>0.05	>0.05	<0.05***
Amylase	B.	170.7±47.72	138.28±51.83	177.6±30.1	193.97±35.22
	A.	202.25±57.13	187.05±96.62	212.13±24.46	275.35±54.54
	T.T.	-1.03819	-.8896796	-1.78030	-3.070448
	P.	>0.05	>0.05	>0.05	<0.05***

NO OF CASES TREATED BY INDERAL:
< 60 YEARS = 6 , >= 60 YEARS = 4.

NO OF CASES TREATED BY TENORMIN:
< 60 YEARS = 4, >= 60 YEARS = 6.

B.: BEFORE.

A.: AFTER.

TABLE (8): COMPARISON BETWEEN TWO CASES OF HYPERAMYLASEMIA AFTER BETA-BLOCKADE WITH RECENT UPPER ABDOMINAL PAIN = EPIGASTRIC PAIN.

Case No.	Age in yrs	Sex	Blood press.	Location of Coronary heart dis.	Type of beta-blockade	Serum amylase S.U./100ml	Serum TG mg/100ml	Serum FFA mg/100ml
3	58	Male	80 -- 50	Recent antero Septal and old Lateral infarction	Atenolol (Tenormin)	327.9	217.0	23
10	60	Female	85 -- 55	Recent inferior infarction	Atenolol (Tenormin)	354.0	270.0	26

TABLE (9): COMPARISON BETWEEN MALES & FEMALES.

		MALE	FEMALE
AGE.		58.28 ± 6.51	56.5 ± 8.34
FFA.	B.	21.02 ± 5.31	19.23 ± 4.39
	A.	19.13 ± 4.58	18.22 ± 3.85
	T.T.	1.006691	0.4260916
	P.	>0.05	>0.05
	SIG.	NONSIG.	NONSIG.
TG.	B.	131.07 ± 16.23	131.37 ± 14.17
	A.	167.98 ± 29.9	169.35 ± 56.48
	T.T.	-4.059604	-1.131835
	P.	<0.05***	>0.05
	SIG.	HIGHLY SIG.	NONSIG.
AMYLASE.	B.	168.84 ± 45.32	181.3 ± 41.44
	A.	219.97 ± 68.1	230.45 ± 70.60
	T.T.	-2.339086	-1.47064
	P.	<0.05***	>0.05
	SIG.	HIGHLY SIG.	NONSIG.

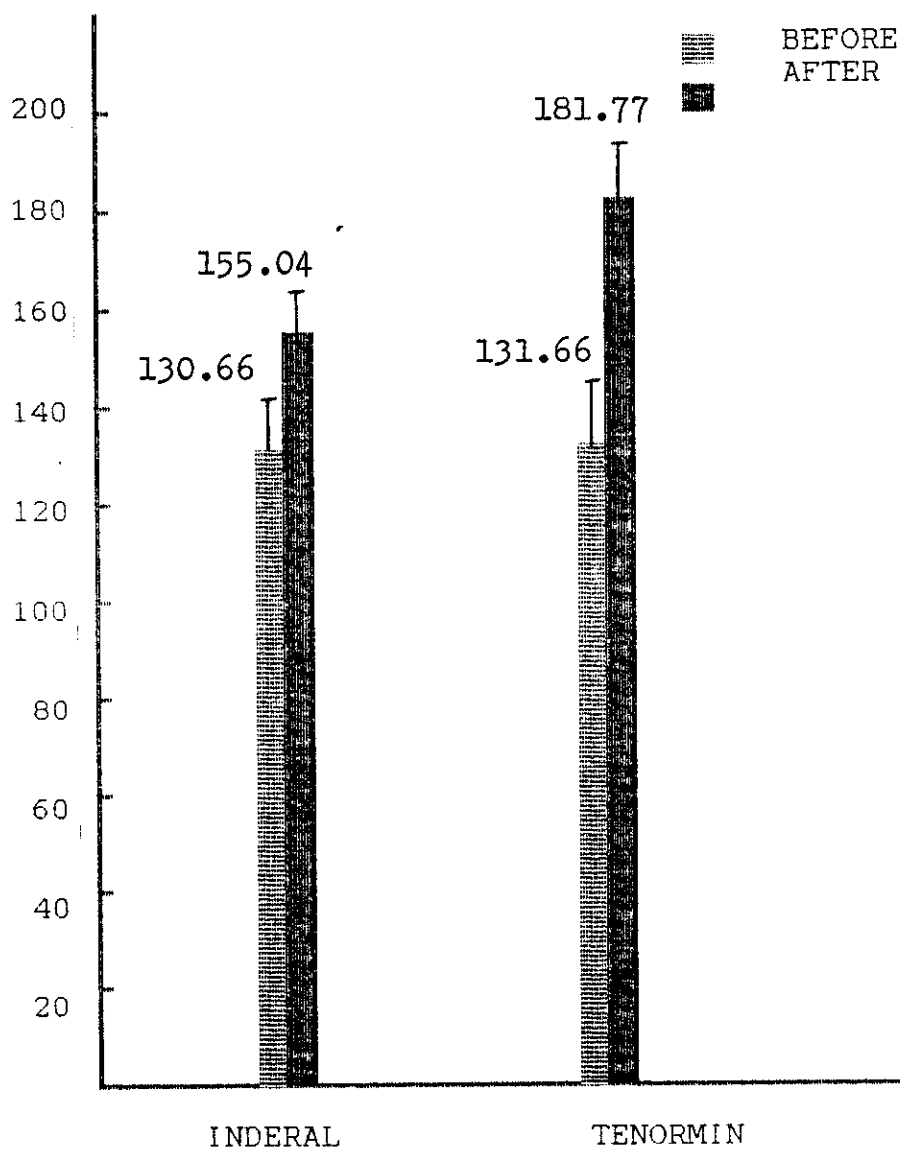


FIG. I

MEANS OF SERUM TRIGLYCERIDES BEFORE AND AFTER BETA-BLOCKADE

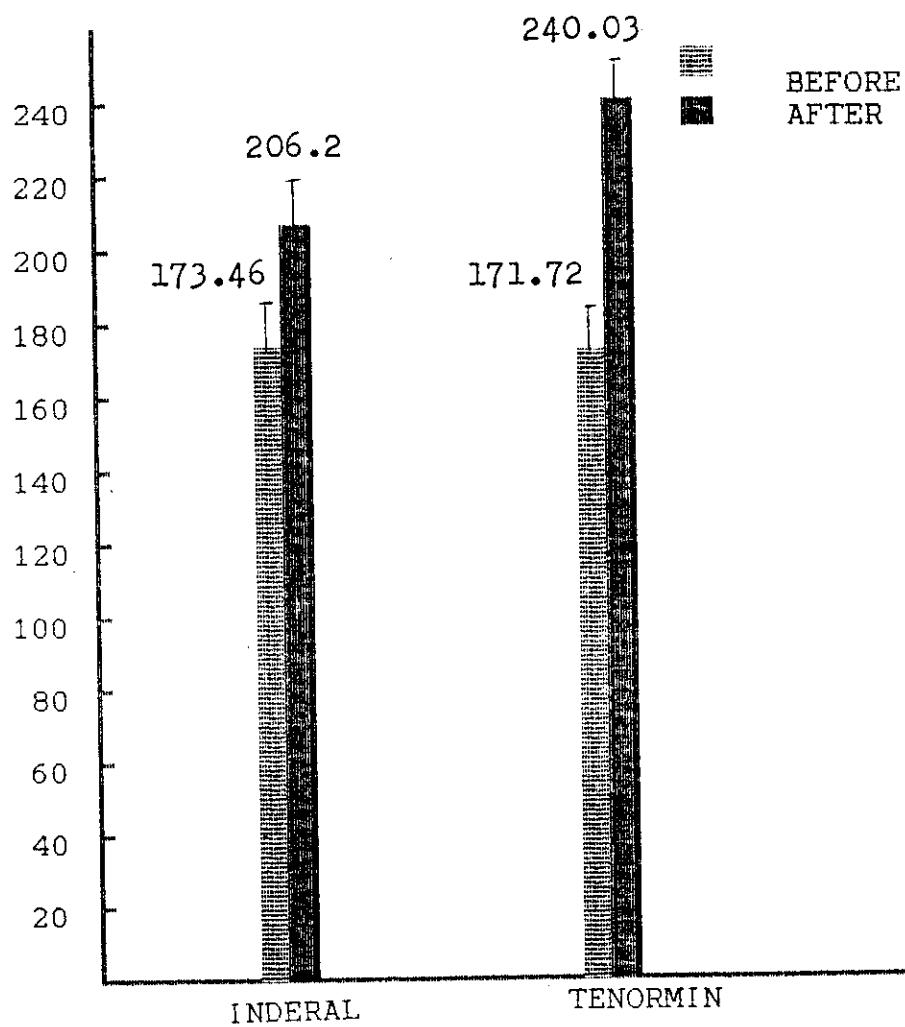


FIG.II
MEANS OF SERUM AMYLASE BEFORE AND AFTER BETA-BLOCKADE.

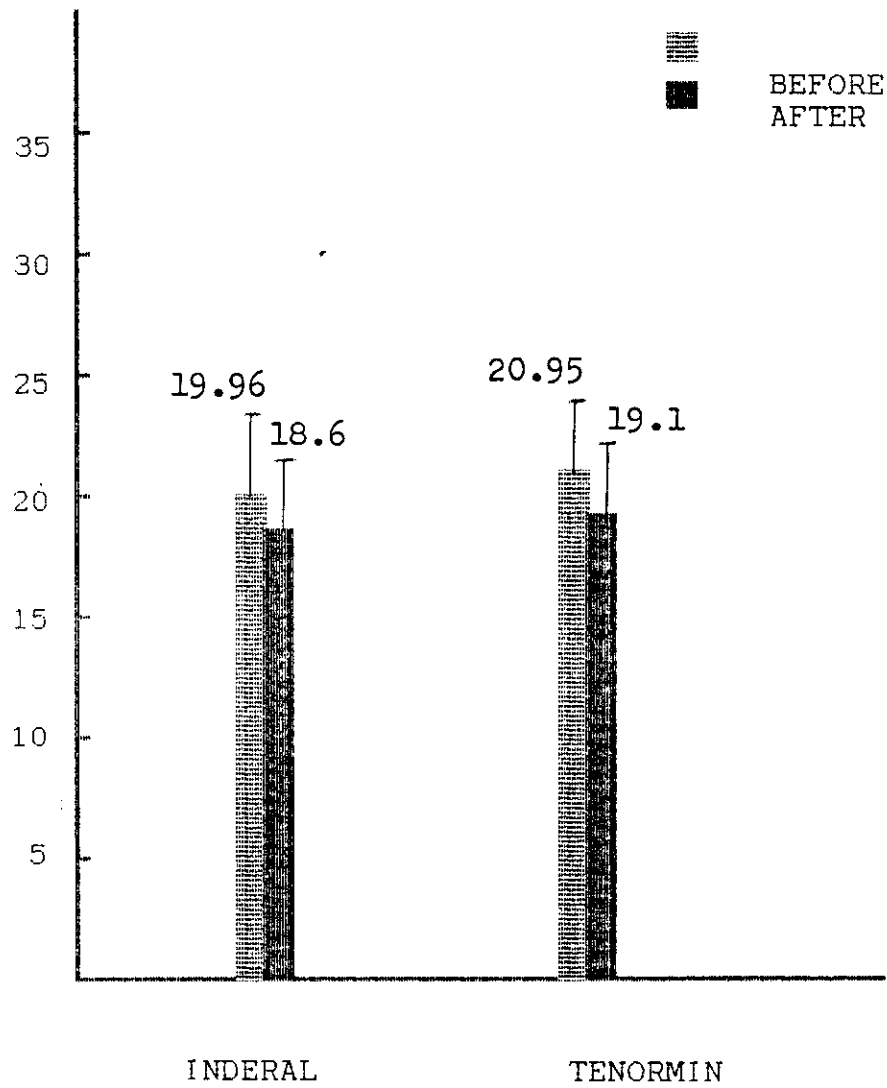


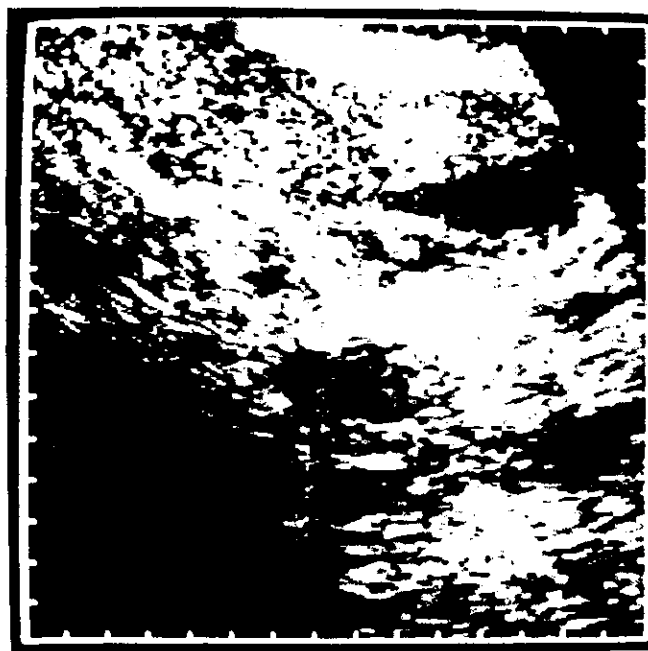
FIG. III
MEANS OF FREE FATTY ACIDS BEFORE AND AFTER BETA-BLOCKADE



Case No. 3



Case No. 6



Case No. 10

FIG. IV Ultrasonography of three cases with marked hyperamylasemia. Normal gall bladder & bile ducts. No biliary stones.



Case No. 4



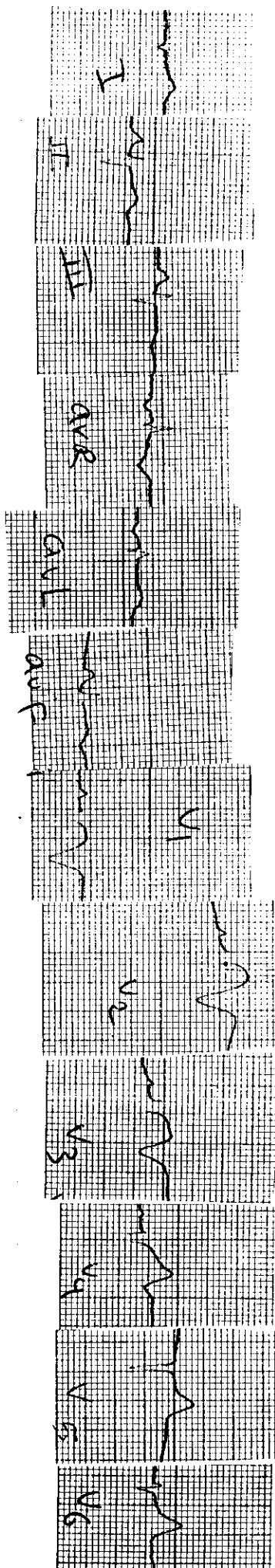
Case No. 11



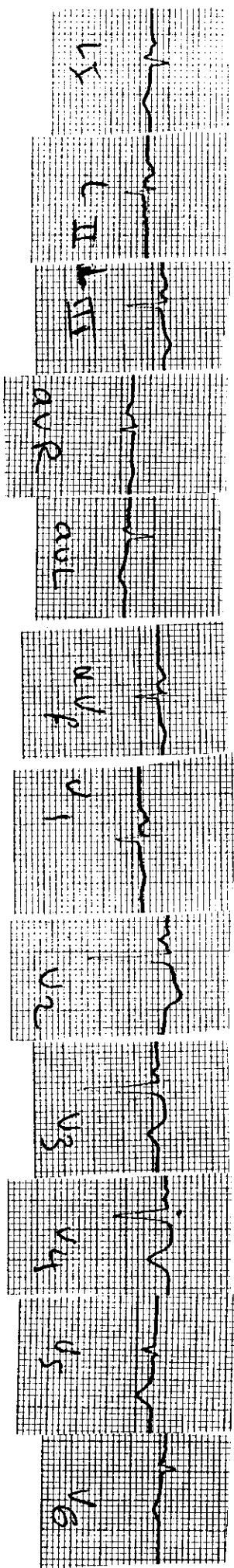
Case No. 20

FIG. V Ultrasonography of three cases with hyperamylase-
mia. Normal gall bladder and bile ducts
No biliary stones.

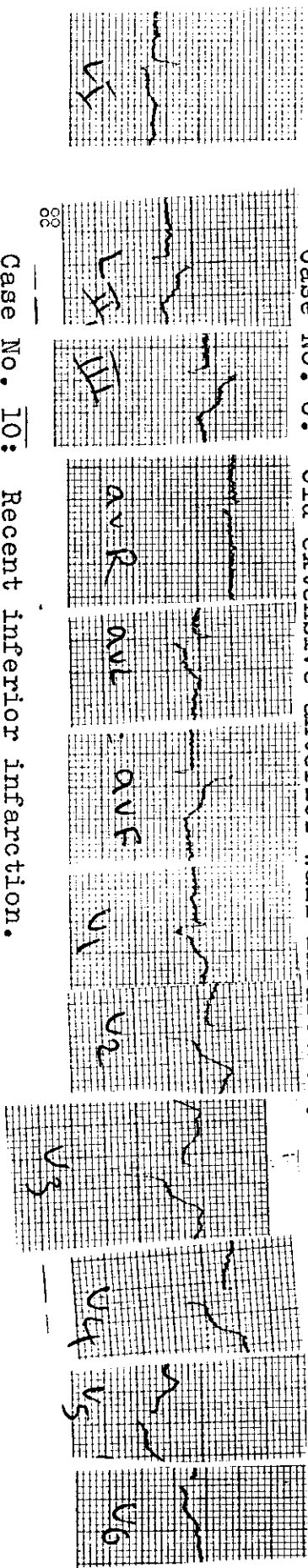
Fig. VI : E.C.G. : Three cases with marked hyperamylosemia.



Case No. 3: Recent anteroseptal and old lateral infarction.



Case No. 6: Old extensive anterior wall infarction.



Case No. 10: Recent inferior infarction.

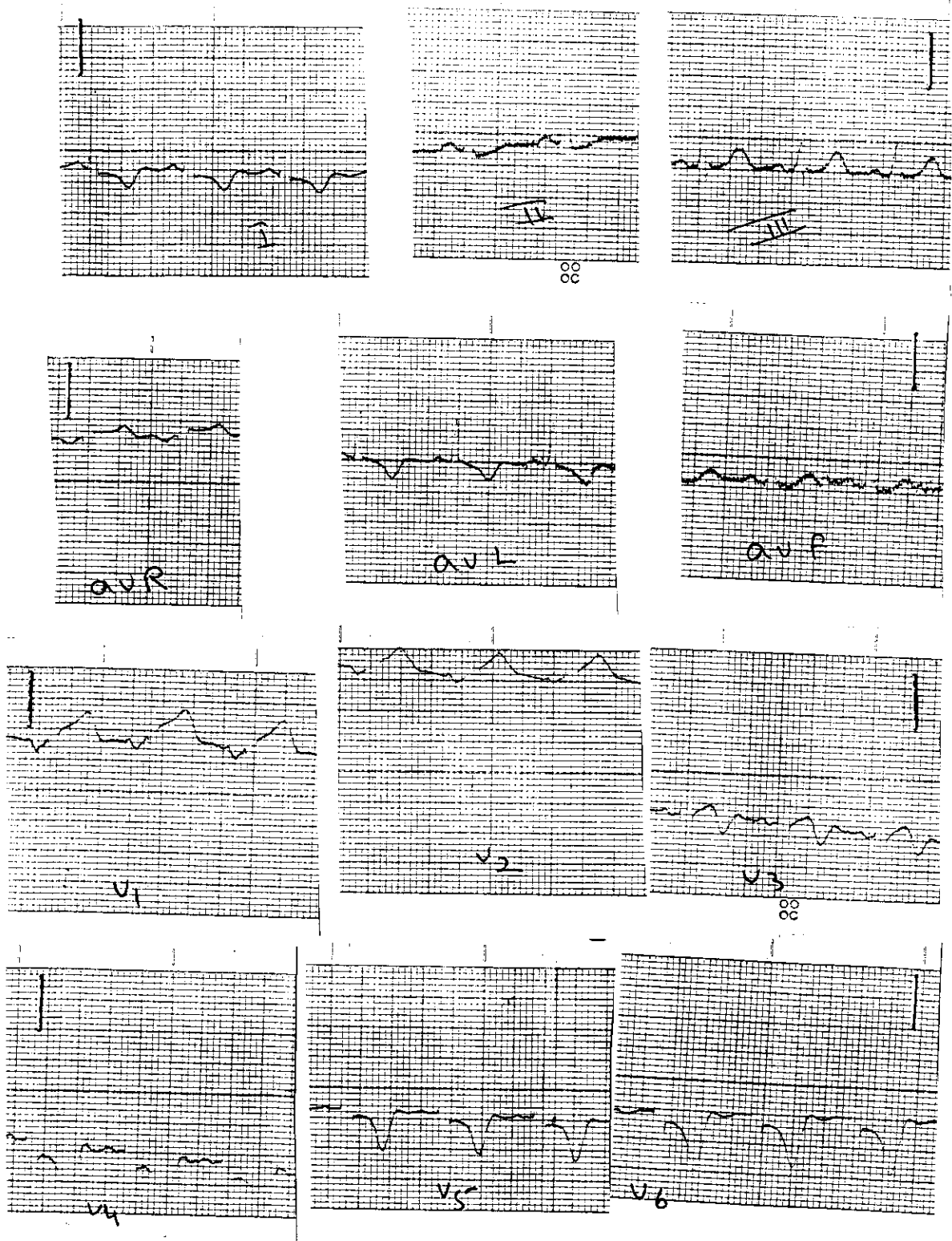


Fig. VII: Case No 4: Subendocardial infarction .

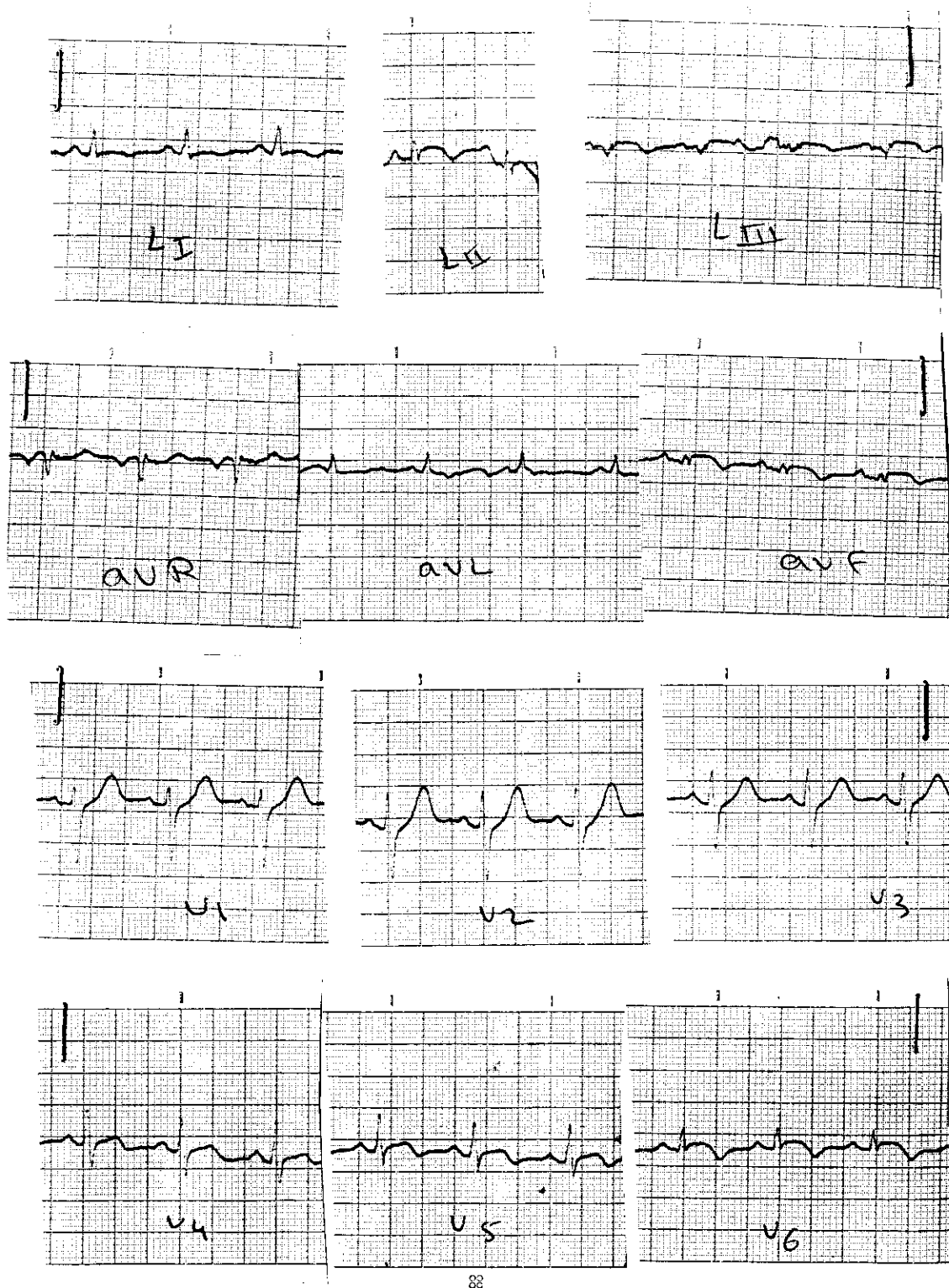


Fig.IX : Case No 7: Old inferior infarction and lateral ischemia.

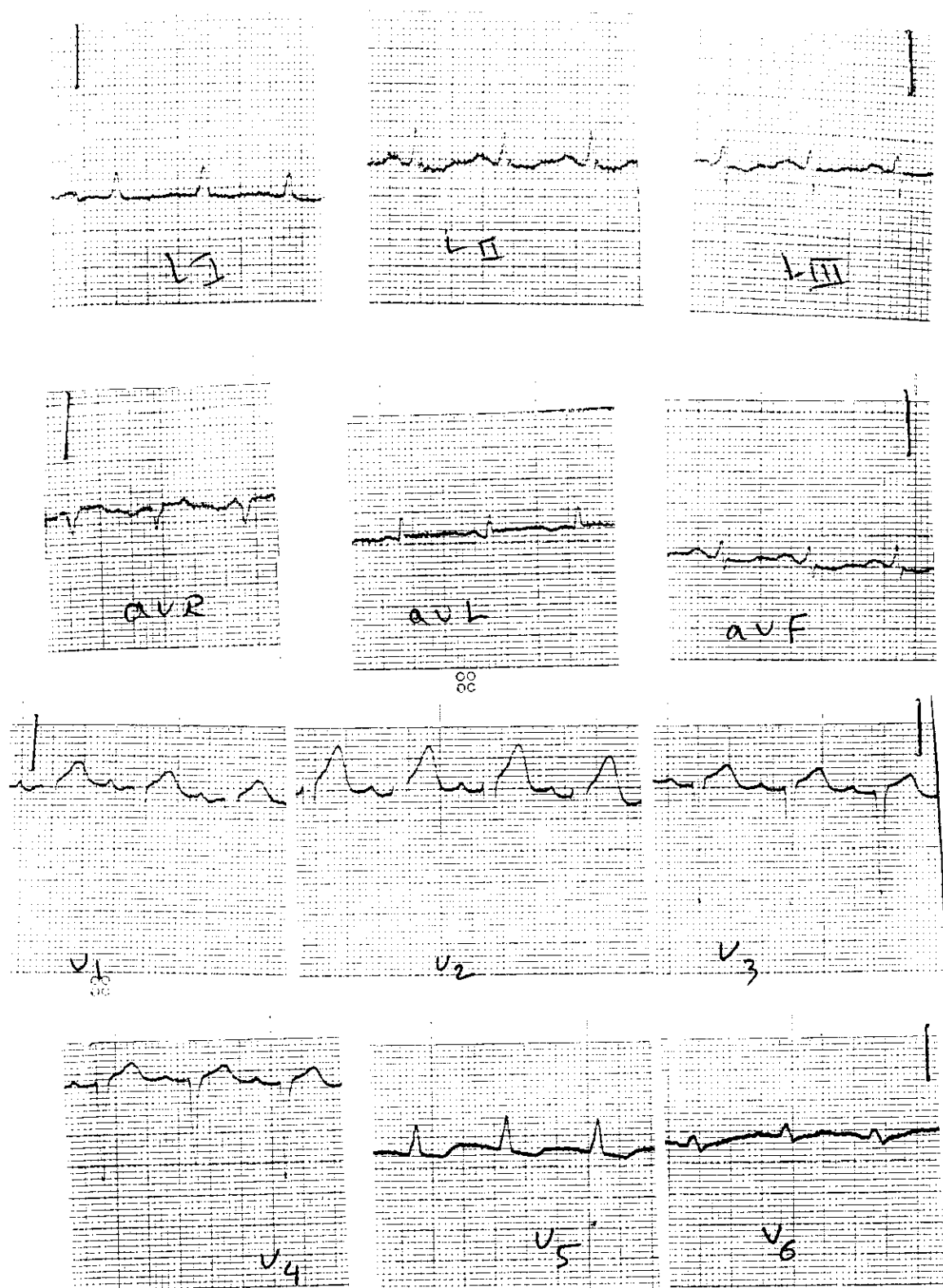


Fig. X : Case No 11: Old anteroseptal infarction with lateral wall ischemia.