RESULTS

The children enrolled in this study were divided into 3 main groups:-

Group I :-Thalassemic patients.

Group II :- Hemophilic patients.

Group III :-Control (healthy children).

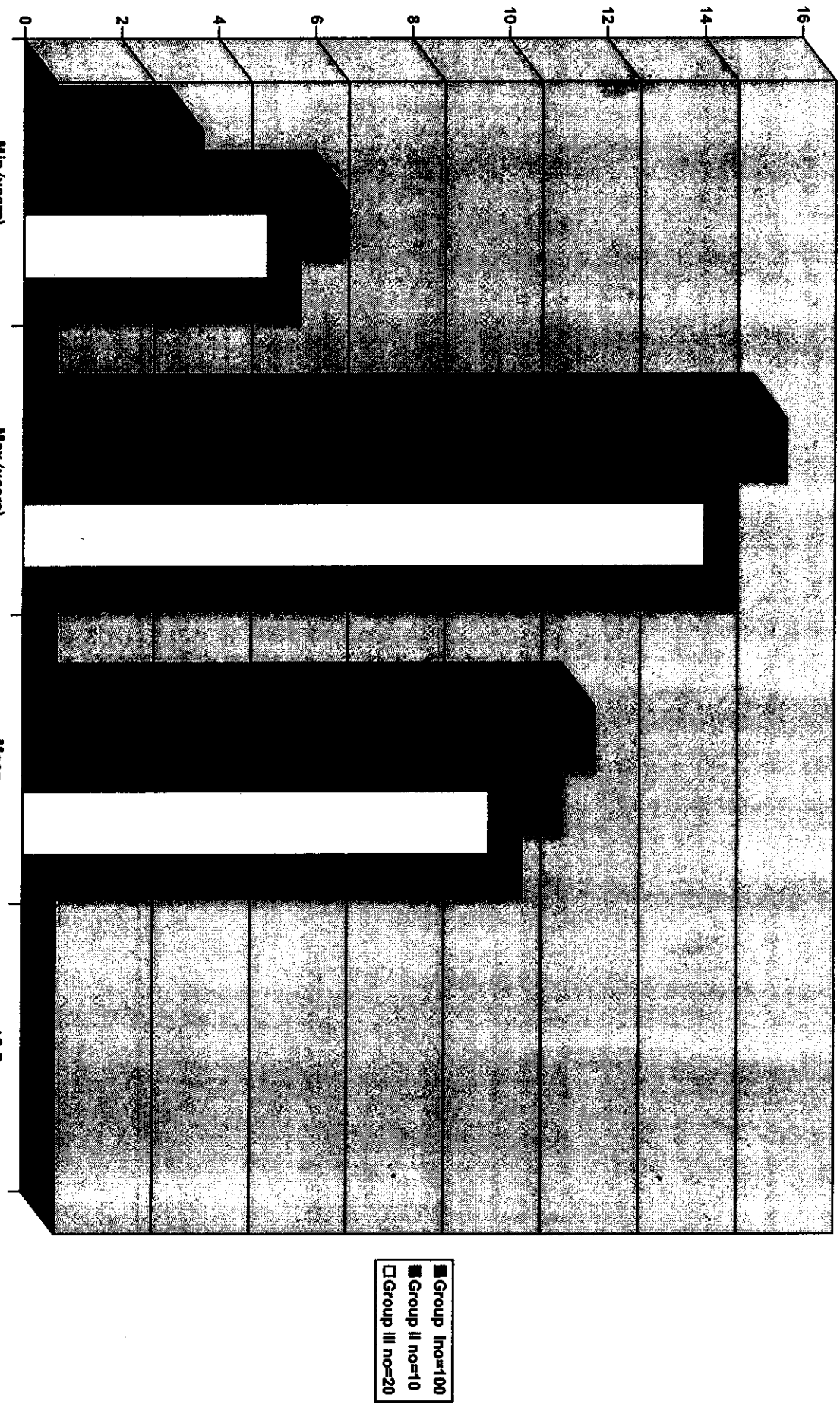
The results are presented in the following tables, pies and graphs.

Table (1) :- Age of the studied groups

	Min. ***(years)***	***Max.*** ***(years)***	***Mean***	***±S.D.***
Group I (no=100)	*3*	*15*	*11.1*	*±3.3*
Group II (no=10)	*6*	*14*	*10.4*	*±2.4*
Group III (no=20)	*5*	*14*	*9.6*	*±2.6*

ANOVA = 1.98 ***P > 0.05 non sig.***

Table (1) showed that there is no significant difference in the mean age between cases and control.



Figure(1):Age of the studied groups

Table (2):Gender of the studied groups

	GroupI **(no=100)** **No %**	***GroupII*** **(no=10)** **No %**	***GroupIII*** **(no=20)** **No. %**
Male	*66 66%*	*10 100%*	*14 70%*
Female	*34 34%*	*0 0%*	*6 30%*

$X^2 = 4.9$ ***P > 0.05 non sign.***

Table (2) showed that the number of patients in group I were 100 [66 males (66%) and 34 females (34%)] and group II 10 patients [all are males] and group III 20 children [14 males (70%) and 6 females (30%)] and there is no significant difference in the gender of the cases in comparison to control.

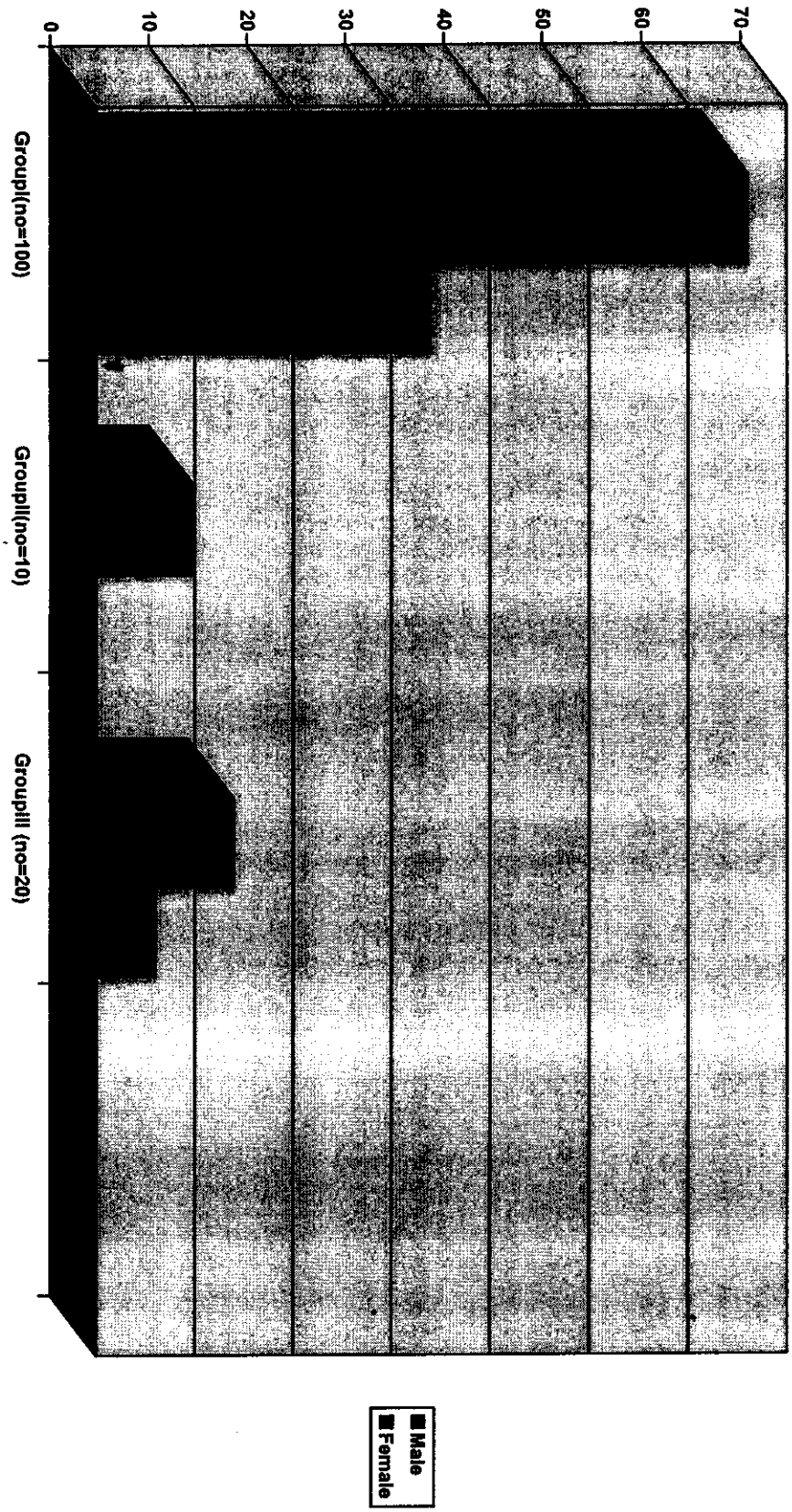


Figure (2): Gender of the studied groups.

Table (3):Different types of viral hepatitis among group I

	male	female	Total	
HCV only	6	3	9/100	9%
HBV only	6	4	10/100	10%
HCV + HBV	55	24	79/100	79%
Non	-	2	2/100	2%
Total	67	33	100	100%

Table (3): Showed the distribution of viral hepatitis serology among the group I, Where combined HCV + HBV infection was 79% (79 cases, 55 males and 24 females). It was the most prevalent among multi-transfused thalassemic children . HCV infection alone was detected in 9% (9 cases, 6 males and 3 females). But HBV infection was detected in 10% (10 cases, 6 males and 4 females) and there is only 2 cases (2%) had no markers for HBV or HCV infection.

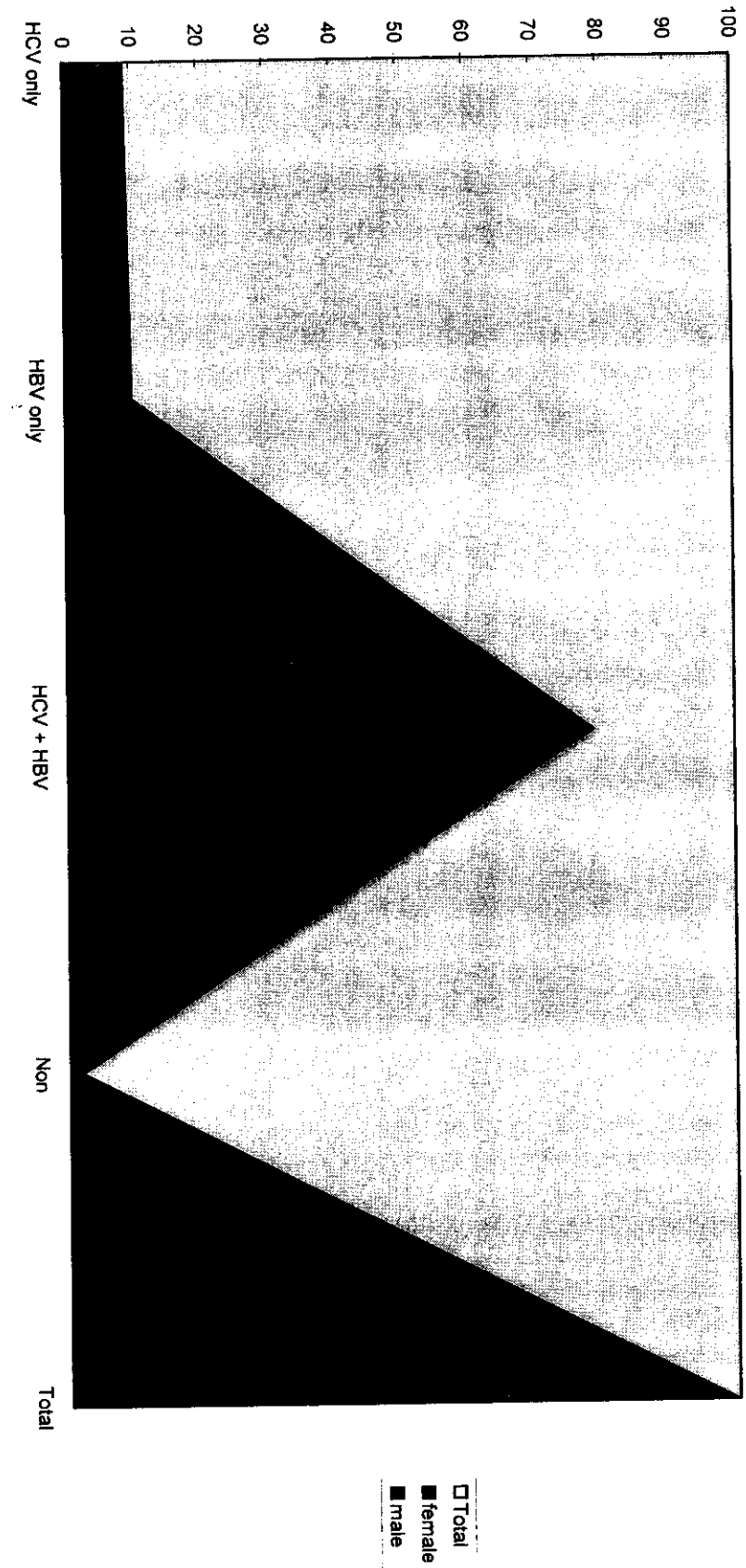


Figure (3): Different types of viral hepatitis among group I.

Table (4):Different types of viral hepatitis among group II.

	Male	*female*	*Total*
HCV only	*1/10*	-	*1 10%*
HBV only	*1/10*	-	*1 10%*
HCV + HBV	*7/10*	-	*7 70%*
Non	*1/10*	-	*1 10%*
Total	*10*	-	*10 100%*

Table (4): Showed the distribution of viral hepatitis serology among the group II, Where combined HCV + HBV infection was 70% (7/10 cases)and 10%(1/10) for HCV infection alone and HBV infection alone and only one case (10%) had no markers for HBV or HCV infection.

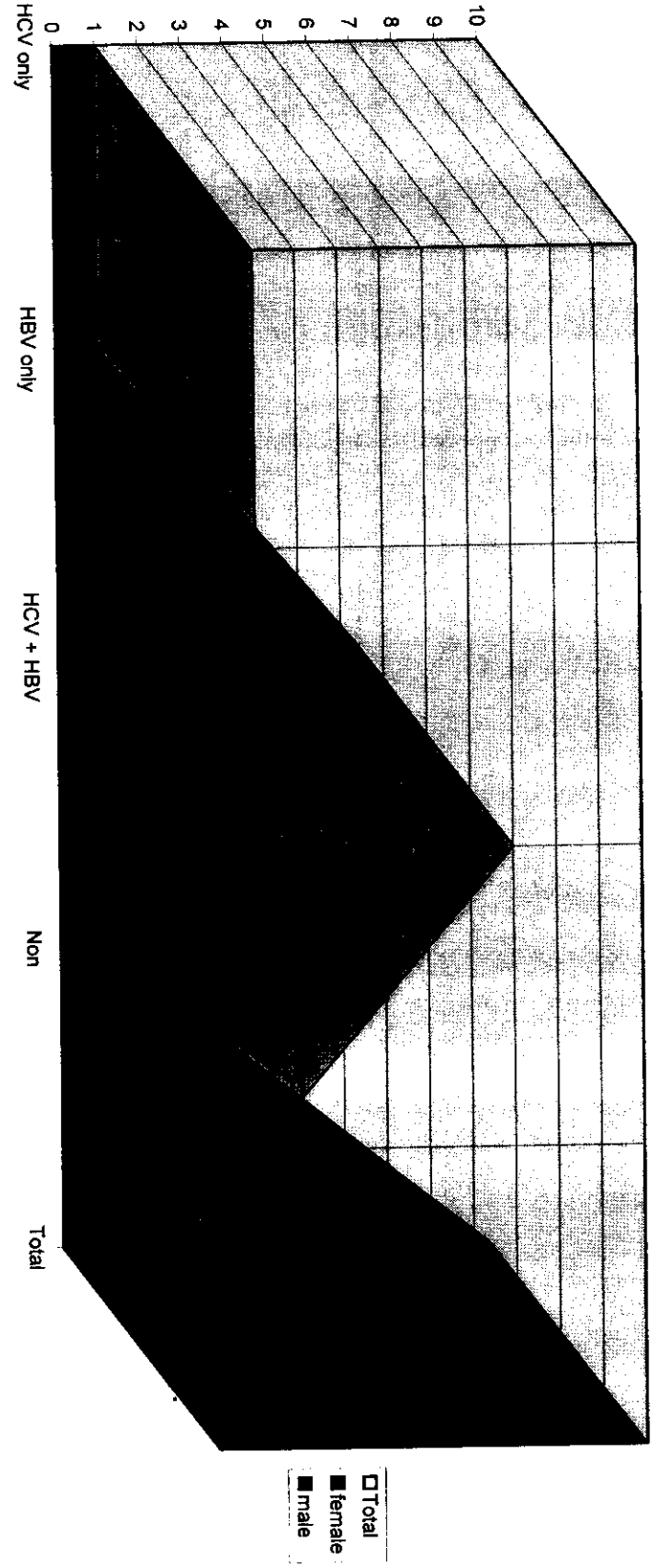


Figure (4): Different types of viral hepatitis among group II.

Table (5): HBsAg marker in the studied groups by ELISA.

	HBsAg -ve		*HBsAg +ve*		*Total*
	No.	*%*	*No.*	*%*	
Group I	*95*	*95%*	*5*	*5%*	*100*
Group II	*10*	*100%*	*0*	*0%*	*10*
Group III	*19*	*95%*	*1*	*5%*	*20*

$X^2 = 0.52$ $P > 0.05$ ***non sign.***

Table (5): showed only 5 cases (5%) of the group I has HBs antigenemia and no any one in the group II and only one of the group III was positive for HBsAg (1/20, 5%).Although there is no significant difference between cases and control but still the rate of HBsAg is higher in group I.

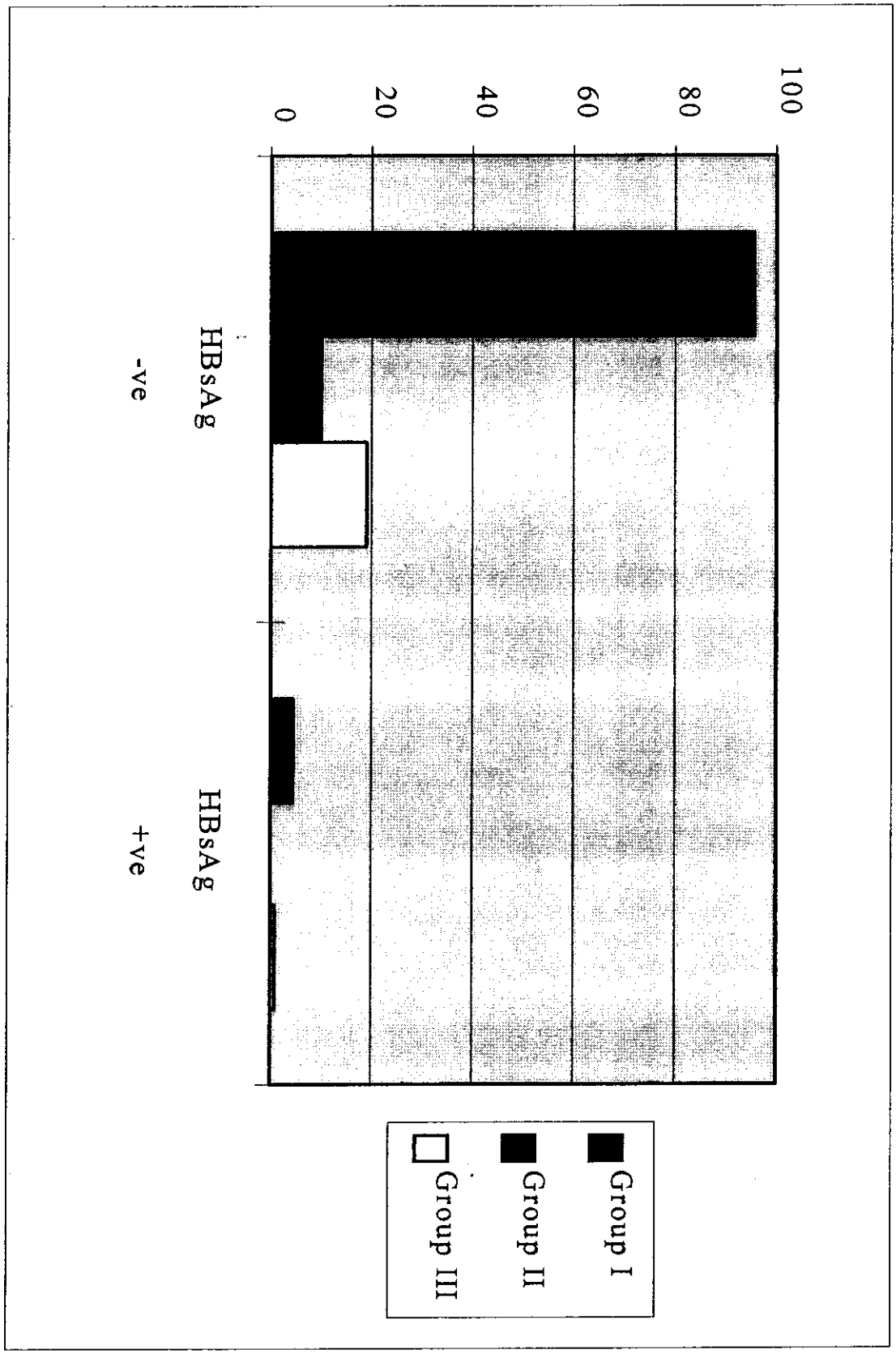


Figure (5): HBsAg marker in the studied groups.

Table(6):HBsAb among the studied groups by ELISA.

	HBsAb -ve		HBsAb +ve		Total
	No.	%	No.	%	
Group I	54	54%	46	46%	100
Group II	6	60%	4	40%	10
Group III	15	75%	5	25%	20

X^2= 2.03 ***P > 0.05 non sign.***

Table(6):showed 46 patients of the group I ,was positive for HBsAb (46/100, 46%) and 4 of the group II (4/10, 40%) had positive HBsAb (past infection or immunity) and 5 children of the group III were positive for HBsAb (5/20, 25%) Although there is no significant difference between cases and control but still the rate of HBsAb is higher in group I.

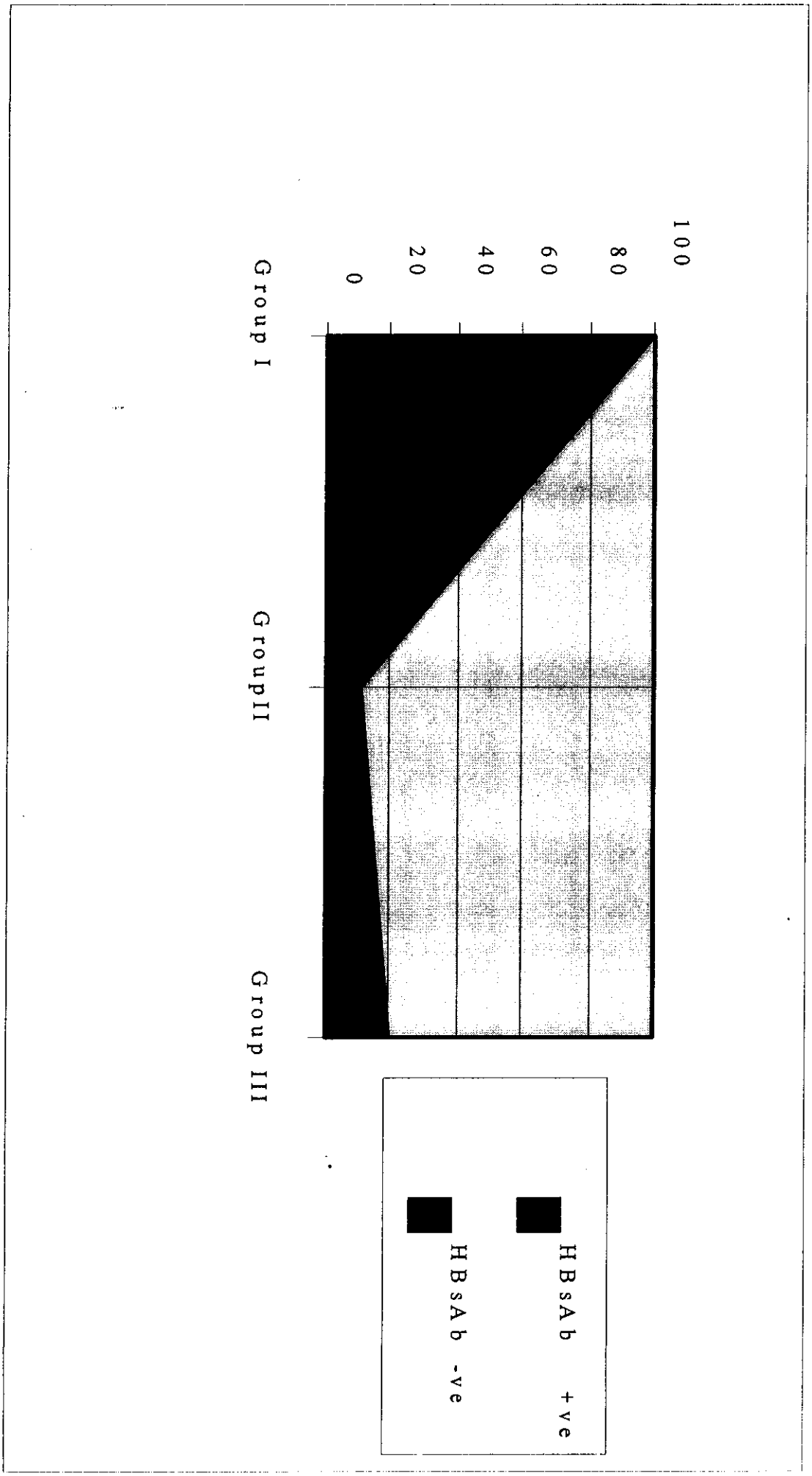


Figure (6): HBsAb marker in the studied groups.

Table(7):HBcAb among the studied groups by ELISA.

	HBcAb -ve.		*HBcAb +ve*		*Total*
	No.	*%*	*No.*	*%*	
Group I	*39*	*39%*	*61*	*61%*	*100*
Group II	*6*	*60%*	*4*	*40%*	*10*
Group III	*19*	*95%*	*1*	*5%*	*20*

X^2= 21.04 ***P < 0.001*** ***highly sign.***

Table (7):showed that 61 patients of the group I were positive for HBcAb (61/100, 61%) and 4 patients of the group II were positive HBcAb(4/10, 40%) and only one of the group III was positive for HBcAb (1/20, 5%) and there is highly significant difference between cases and control.

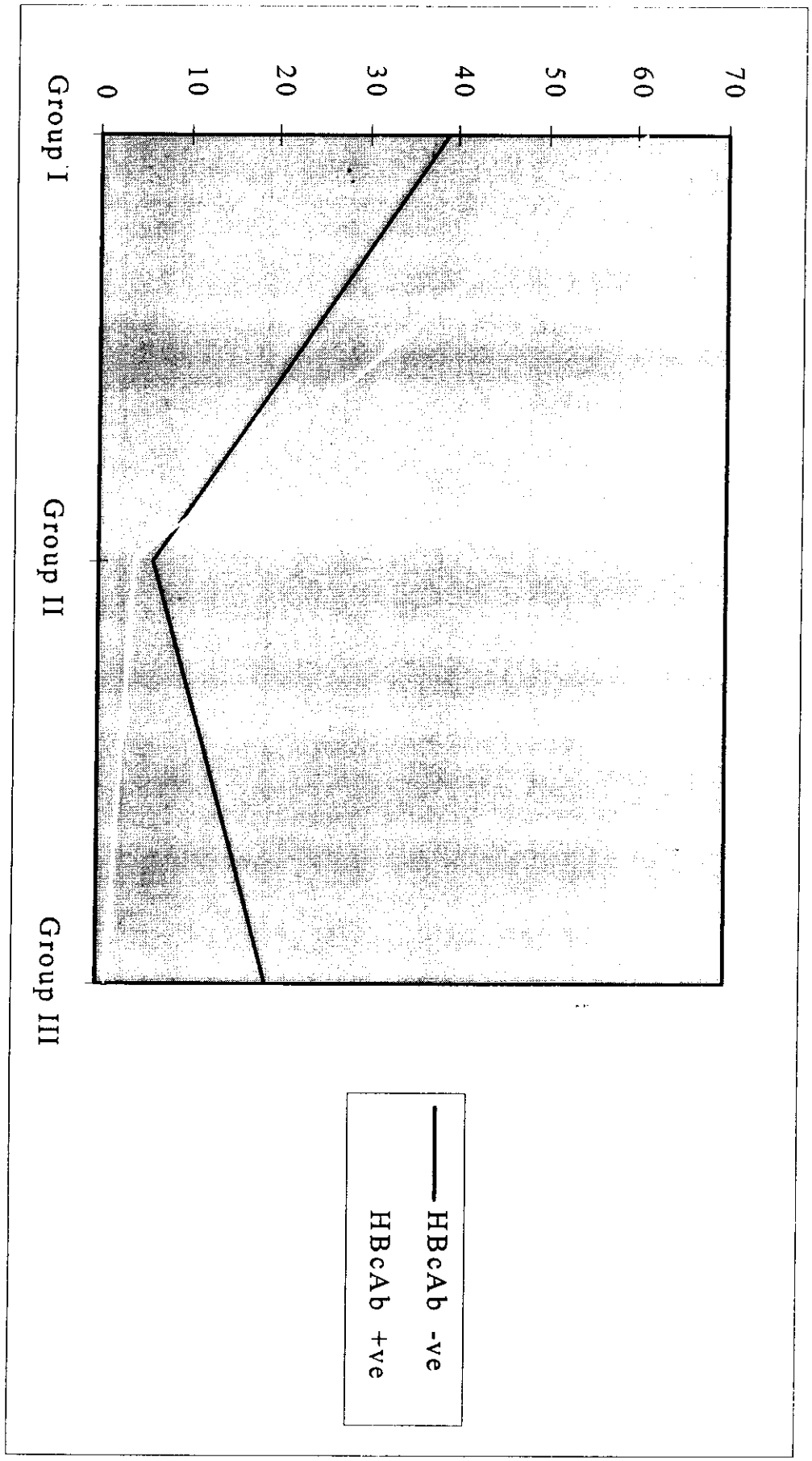


Figure (7): HBcAb marker in the studied groups.

Table (8):Anti- HCV marker among studied groups by ELISA.

	HCV -ve		*HCV +ve*		*Total*
	No.	*%*	*No.*	*%*	
Group I	*12*	*12%*	*88*	*88%*	*100*
Group II	*2*	*20%*	*8*	*80%*	*10*
group III	*19*	*95%*	*1*	*5%*	*20*

$X^2 = 60.78$ $P < 0.001$ ***highly sign.***

Table (8): Showed the distribution of HCV antibodies in the studied groups where, in the group I, 88 patients were seropositive HCV antibodies (88/100, 88%) and in the group II ,8 patients (8/10, 80%) was HCV positive and there is only one of the group III was seropositive for HCV antibodies (1/20, 5%) and there is highly significant difference between cases and control.

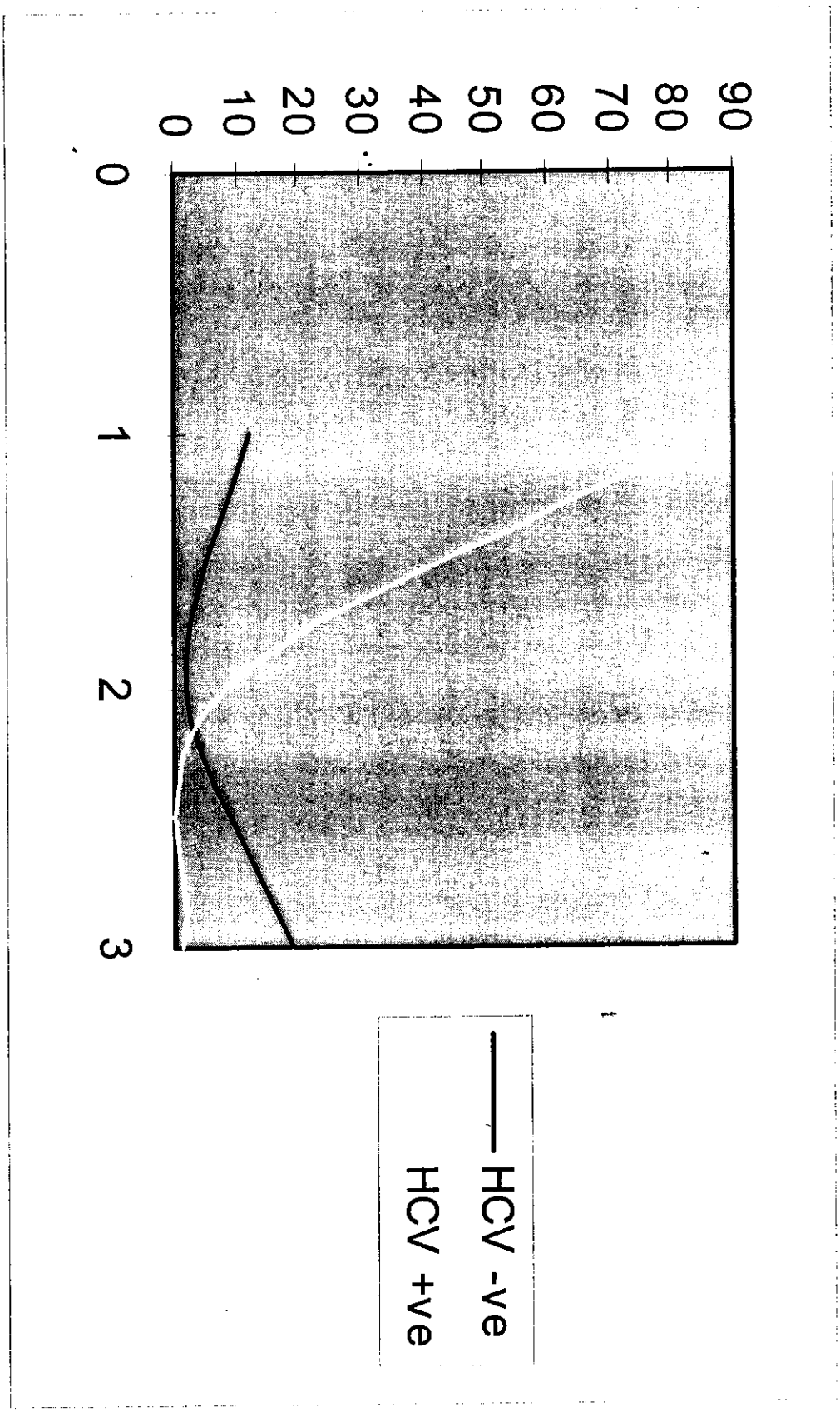


Figure (8): Anti-HCV marker in the studied groups.

Table (9):Age distribution among HCV and HBV infection in group I.

HV infection	*3 - 7 Y*		*>7-12Y*		*>12Y*		*Total*
	No.	*%*	*No.*	*%*	*No.*	*%*	
HCV	*3*	*33.3%*	*4*	*44.4%*	*2*	*22.3%*	*9*
HBV	*3*	*30%*	*5*	*50%*	*2*	*20%*	*10*
HCV + HBV	*8*	*10.1%*	*33*	*41.8%*	*38*	*48.1%*	*79*
Non	*2*	*100%*	*0.0*	*0.0*	*0.0*	*0.0*	*2*

Table (9): Showed the age distribution of viral markers among cases of group I, we noticed that more seropositive cases of HCV markers, where in the age group between 7-12 years represented 44.4% ,while there is 5 positive HBV cases alone in the same age group (50%) .But the combined cases of HCV+HBV in the age group >12 years represented 48.1% of the cases.

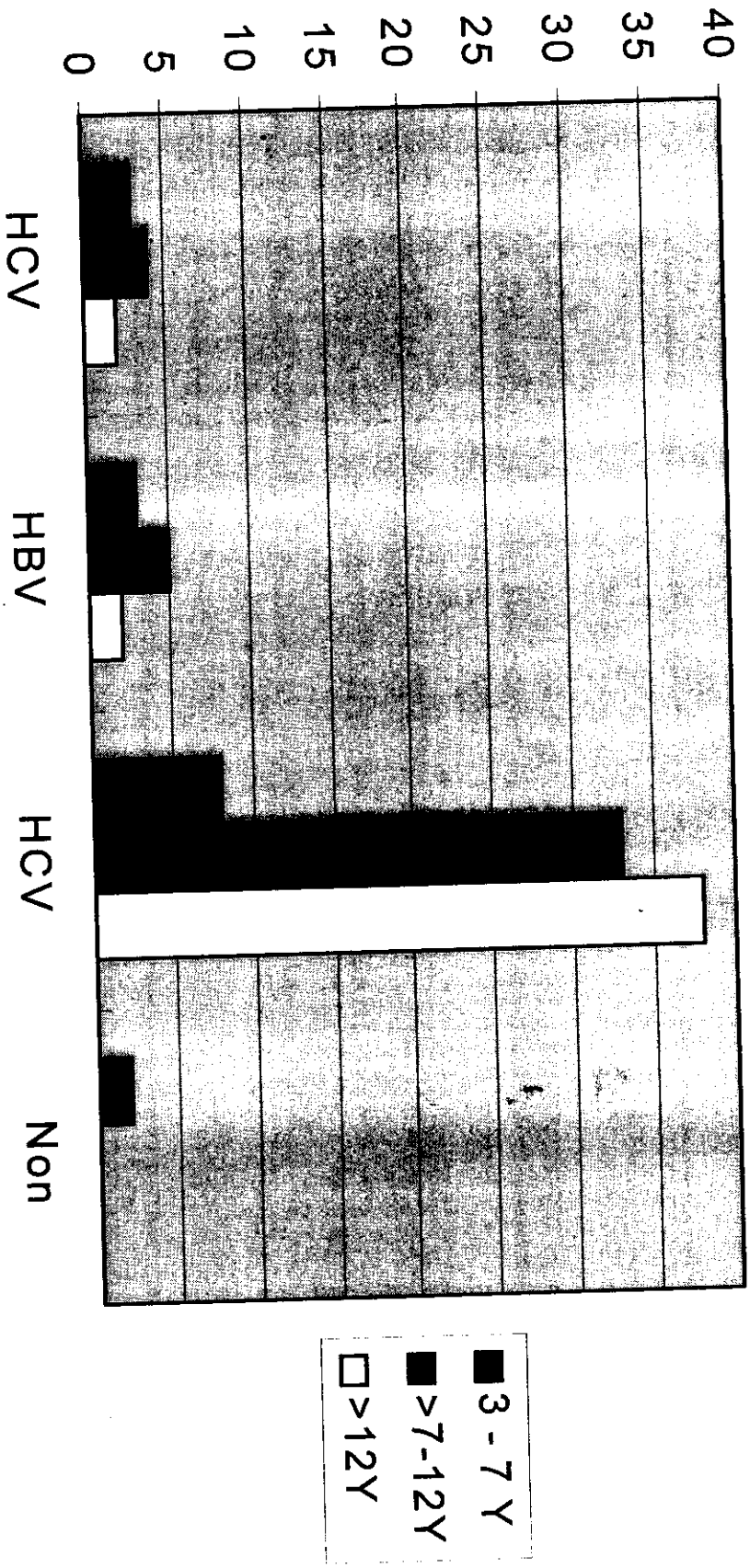


Figure (9): Age distribution among HCV and HBV infection in group I.

Table (10) :- ALT level among the studied groups.

	Min.	*Max.*	*Mean*	*±S.D.*
Group I	*6*	*168*	*45.3*	*±39.51*
Group II	*10*	*89*	*46.7*	*±27.95*
Group III	*4*	*18*	*8.5*	*±4.01*

ANOVA = 9.08 ***P > 0.001 highly sig.***

Table (10): Showed that in group I, the level of ALT was (Min.= 6 I.U and Max. 168 IU) with mean 45.3 ± 39.51 and for group II ,(Min.=10 IU and Max.=89 IU) with mean 46.7 ± 27.95 and for group III, (Min.=4 IU and Max.=18 IU) with mean 8.5 ± 4.01 and there is highly significant increase of ALT level between patients and control.

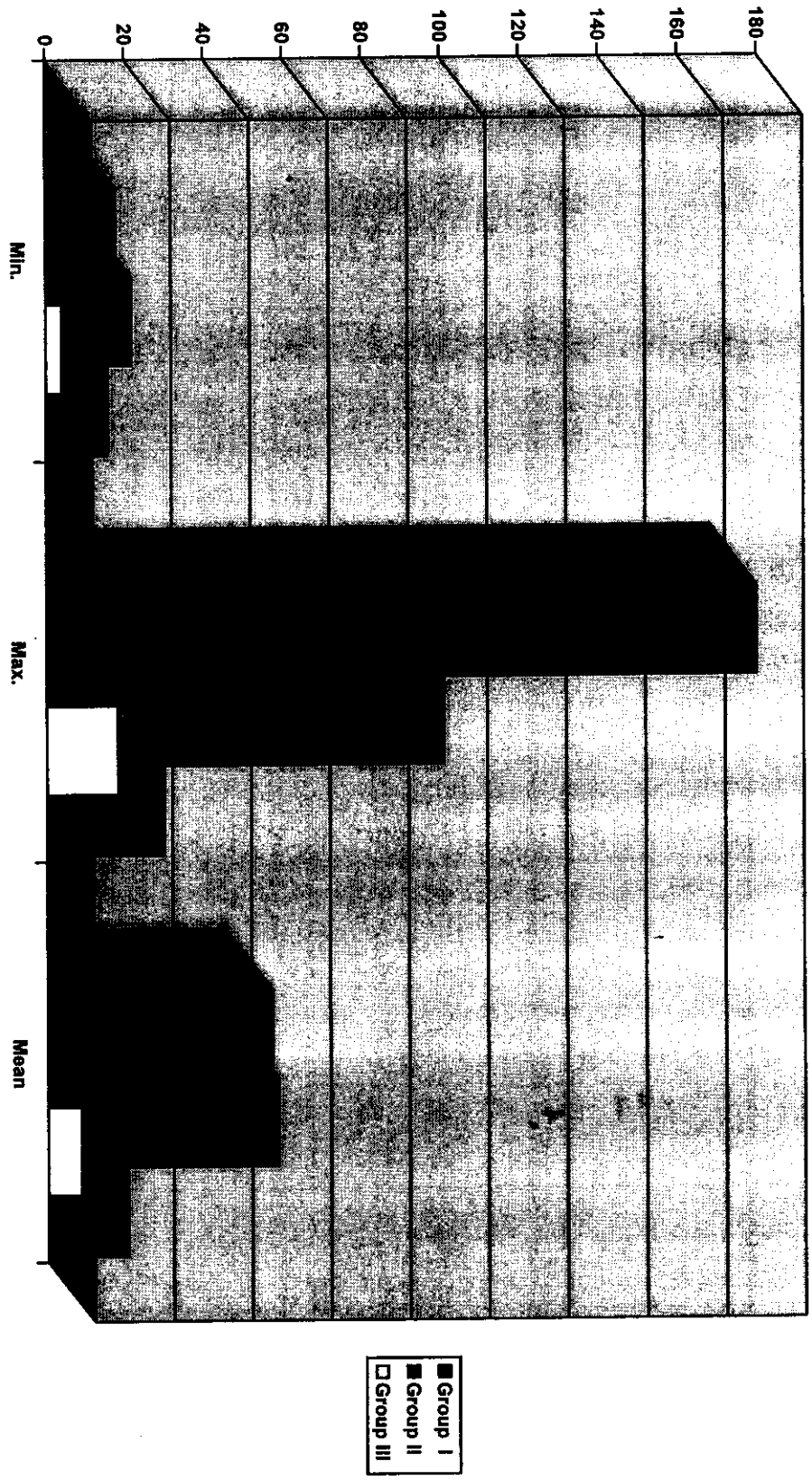


Figure (10) :- ALT level among the studied groups.

Table (11):Relation between ALT and HBsAg among group I.

ALT N=< 50 IU/L	HBsAg -ve No.	%	HBsAg +ve No.	%	Total
Within normal	61	95.3%	3	4.7%	64
1-2 Folds	23	92%	2	8.0%	25
≥2 Folds	11	100%	0	0%	11

$X^2 = 1.07$ $P > 0.05$ non sign.

*Table (11):*showed ALT level according to HBsAg, in the group I ,the big number of patients (64/100) had normal level of ALT [3 only with HBsAg positive and 61 had HBsAg negative], and 25 patients had ALT level [1-2 folds higher than normal] (2 had HBsAg positive and 23 had HBsAg negative).Lastly, 11 patients was HBsAg negative had ALT level≥2 folds than normal level.

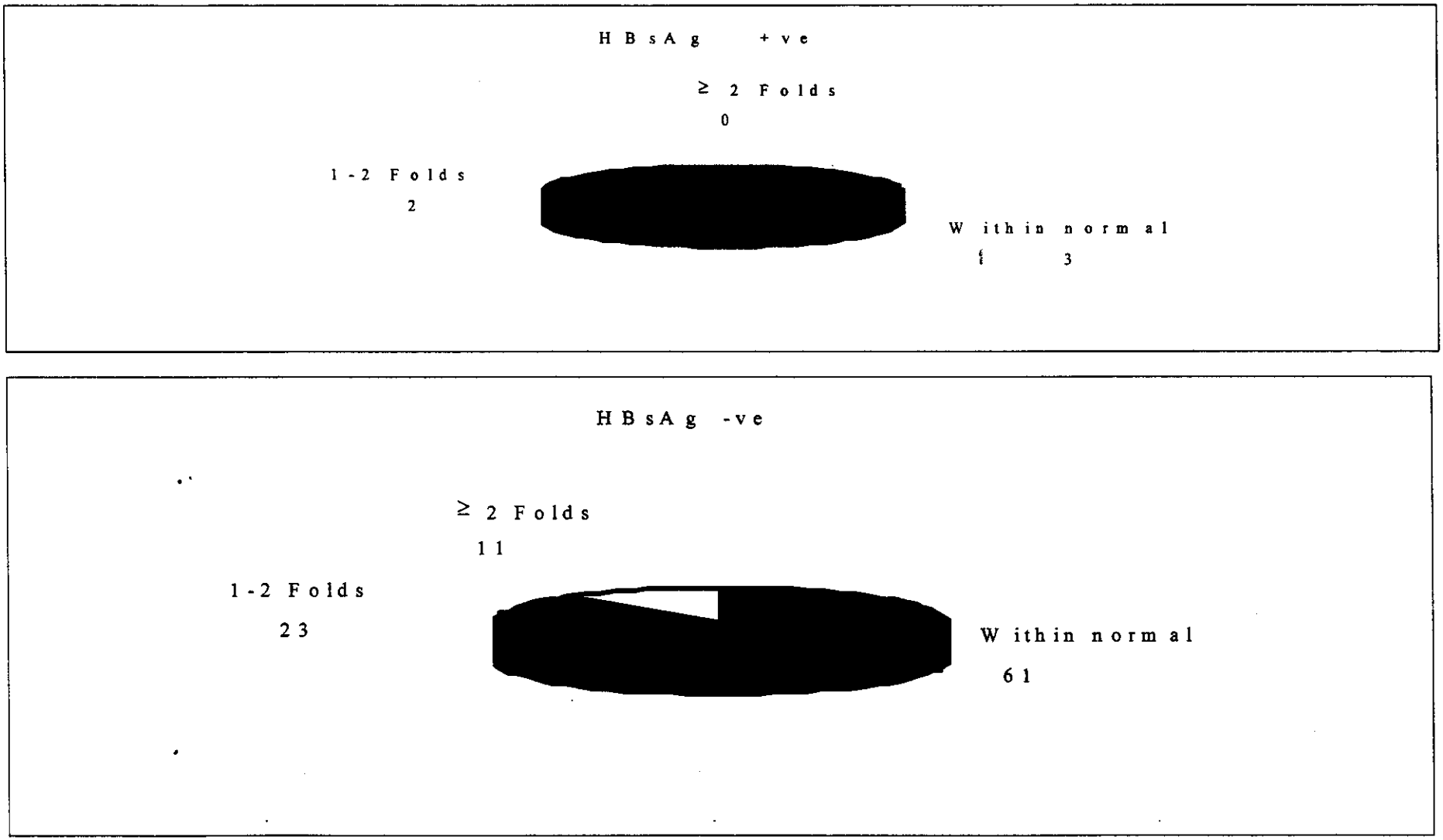


Figure (11): Relation between ALT and HBsAg among group I.

Table(12):Relation between ALT and HBsAb among the group I

ALT N=< 50 IU/L	*HBsAb -ve No.*	*%*	*HBsAb +ve No.*	*%*	*Total No.*	*%*
Within normal	*37/100*	*37%*	*27/10*	*27%*	*64/100*	*64%*
1-2 Folds	*11/100*	*11%*	*14/10*	*14%*	*25/100*	*25%*
≥2 Folds	*6/100*	*6%*	*5/100*	*5%*	*11/100*	*11%*

X^2= 1.004 ***P > 0.05*** ***non sign.***

Table (12):showed that 64 patients had normal level of ALT [27 were HBsAb positive and 37 had HBsAb negative], and 25 patients had ALT level,1-2 folds higher than normal (14 had HBsAb positive and 11 had HBsAb negative).Lastly, 11 patients (5was HBsAb positive and 6were HBsAb negative) had ALT level > 2 folds than normal level, and there is no significant difference between positive and negative cases.

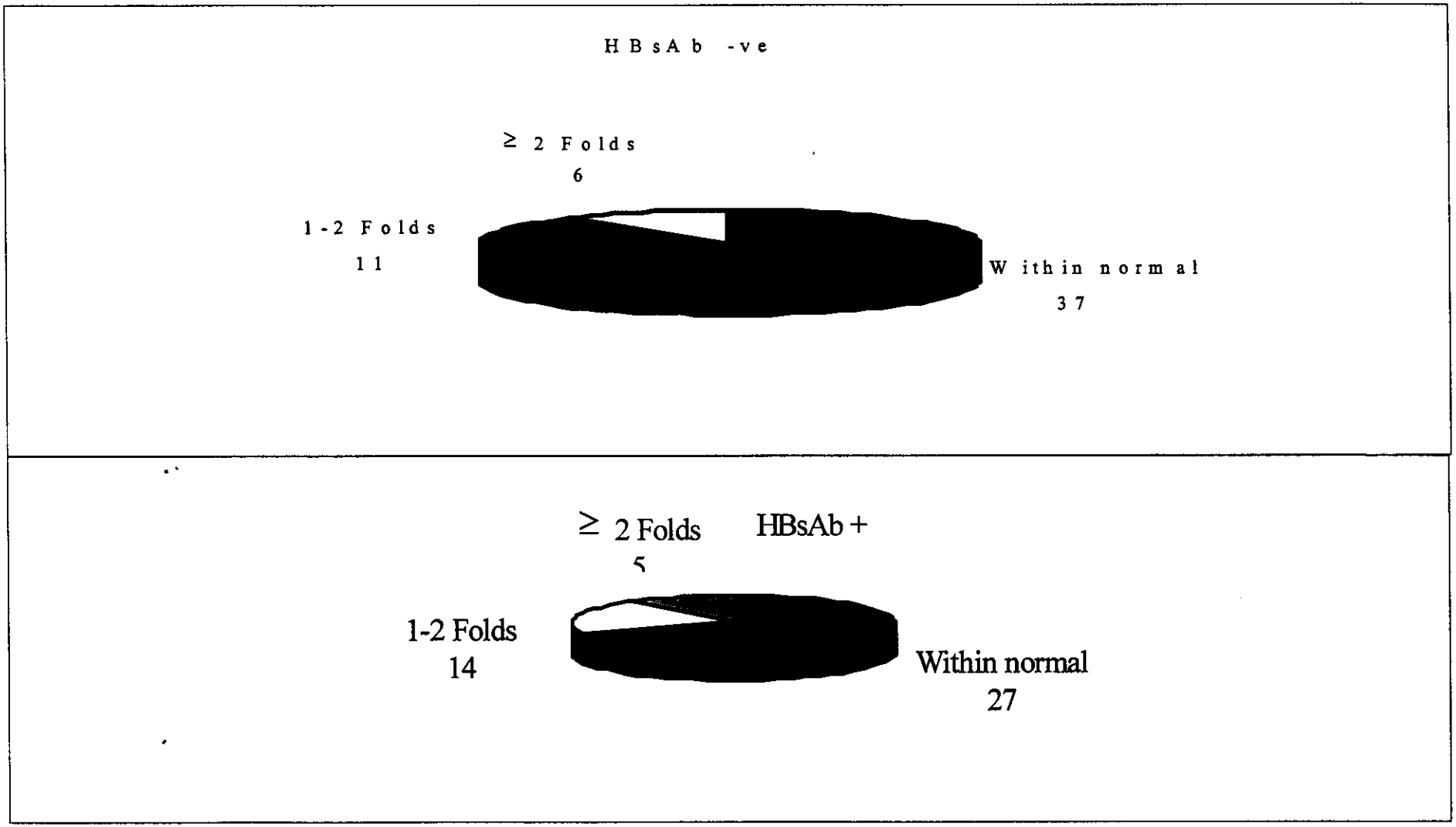


Figure (12): Relation between ALT and HBsAb among group I.

Table (13):Relation between ALT and HBcAb among group I.

ALT N=< 50 IU/L	HBcAb -ve No. %	HBcAb +ve No. %	Total No. %
Within normal	27/100 27%	37/100 37%	64/100 64%
1-2 Folds	9/100 9%	16/100 16%	25/100 25%
≥2 Folds	3/100 3%	8/100 8%	11/100 11%

$X^2 = 1.004$ $P > 0.05$ non sign.

*Table(13):*showed no significant difference in the levels of ALT as regard HBcAb negative or positive cases.

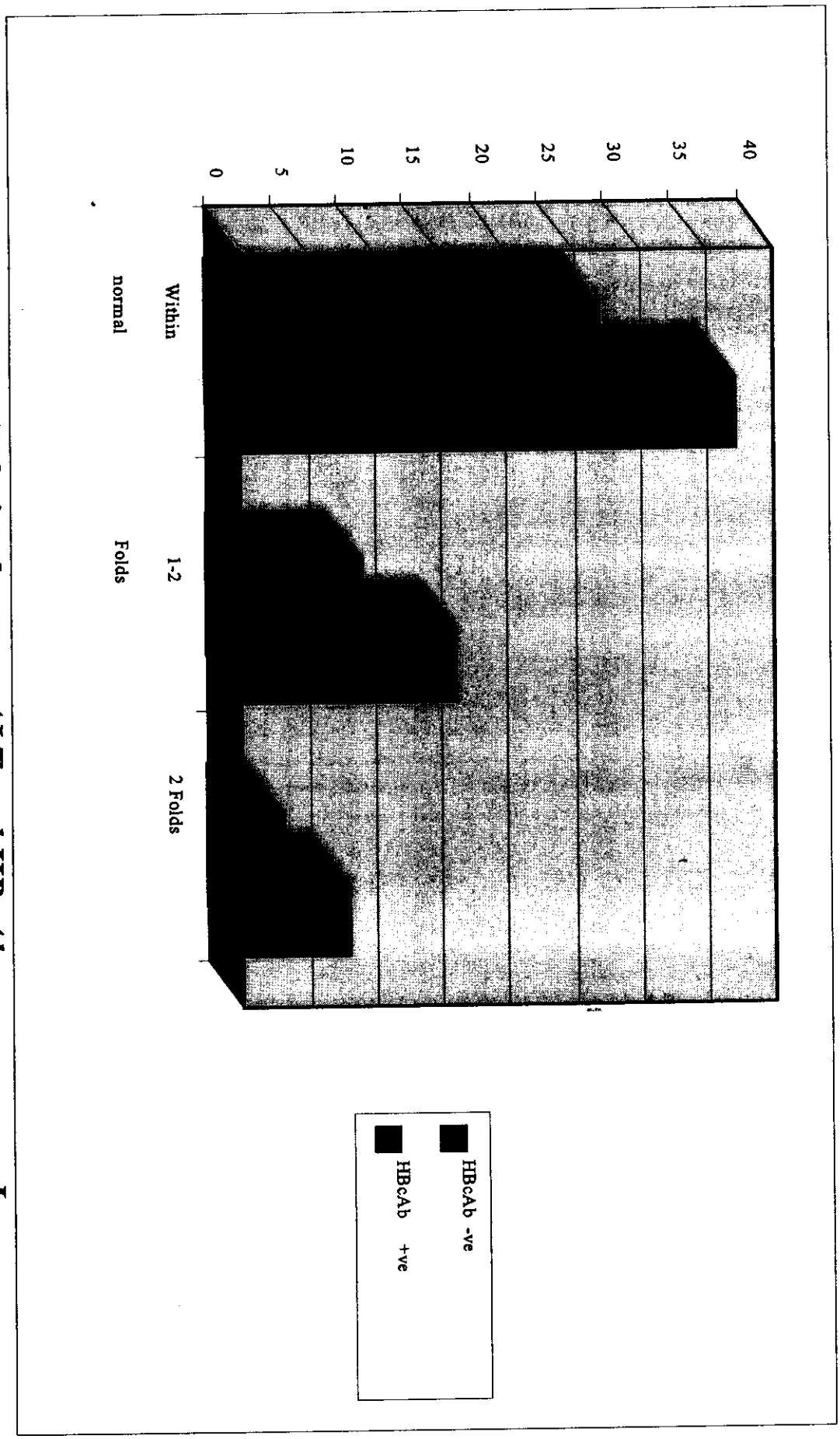


Figure (13): Relation between ALT and HBcAb among group I.

Table (14):Relation between ALT and HCV antibodies in group I.

ALT *N=< 50 IU/L*	*HCV +ve (no=88)* *No.* *%*
Within normal	*52/88* *59%*
1-2 Folds	*25/88* *28.5%*
≥2 Folds	*11/88* *12.5%*

Table(14):showed that 52 positive HCV cases had normal level of ALT, and 25 cases had 1-2 folds higher than normal and lastly only 11 positive cases had ≥2 Folds higher than normal level of ALT.

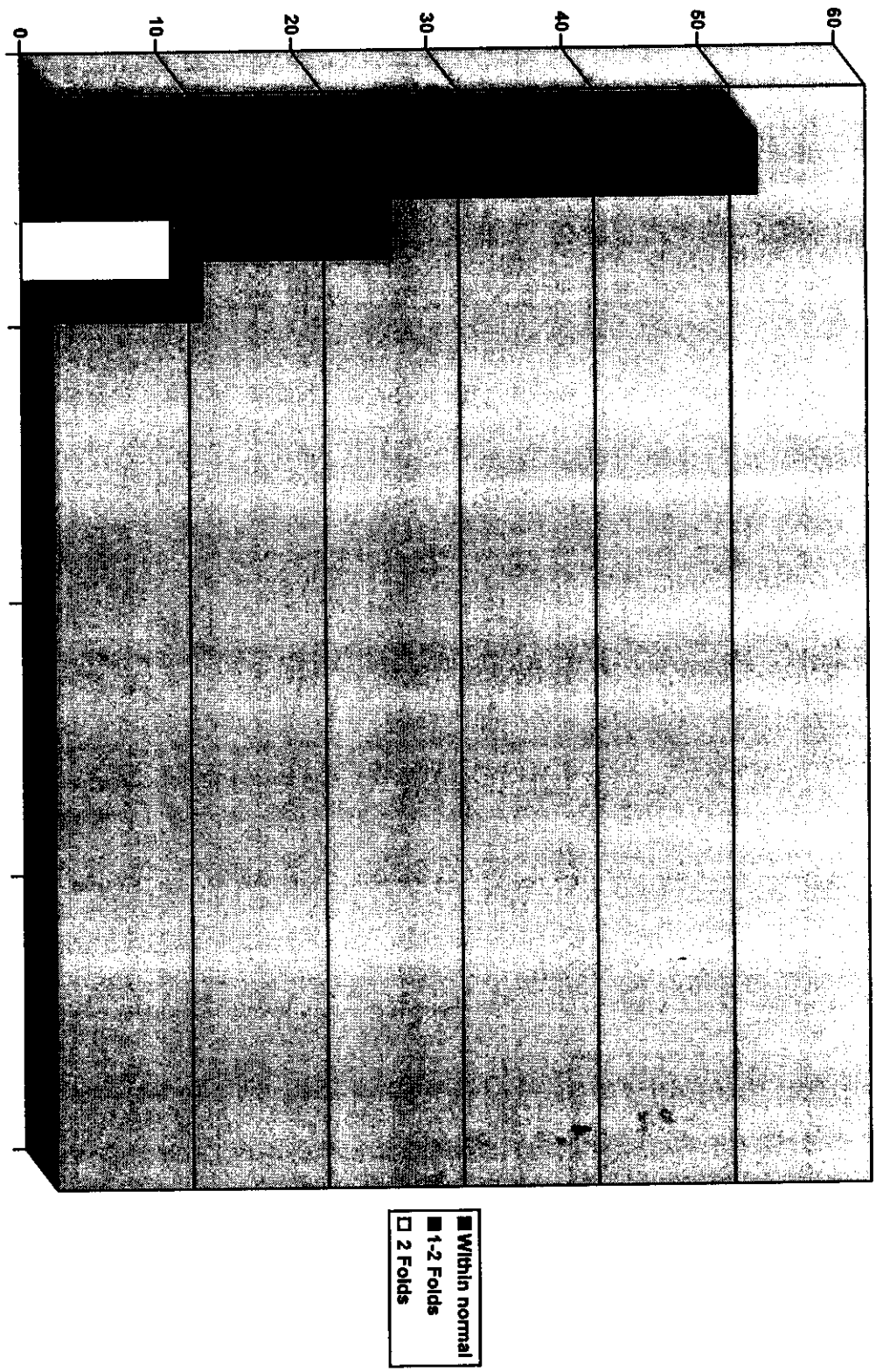


Figure (14): Relation between ALT and HCV antibodies in group I.

Table (15):ALT levels according to type of viral hepatitis infection among group I.

ALT N=< 50 IU/L	HCV No. %	HBV No. %	HCV+HBV No. %
within normal	6/100 6%	10/100 10%	47/100 47%
1-2 Folds (upper limit)	2/100 2%	-	22/100 22%
≥ 2Folds	1/100 1%	-	10/100 10%

Table (15): Showed ALT levels according to different types of hepatitis, the big number of patients had normal level of ALT were cases with combined HCV + HBV (47 cases) and (22 cases) with 1-2 folds than normal ,then (10 cases) had more than 2 folds.

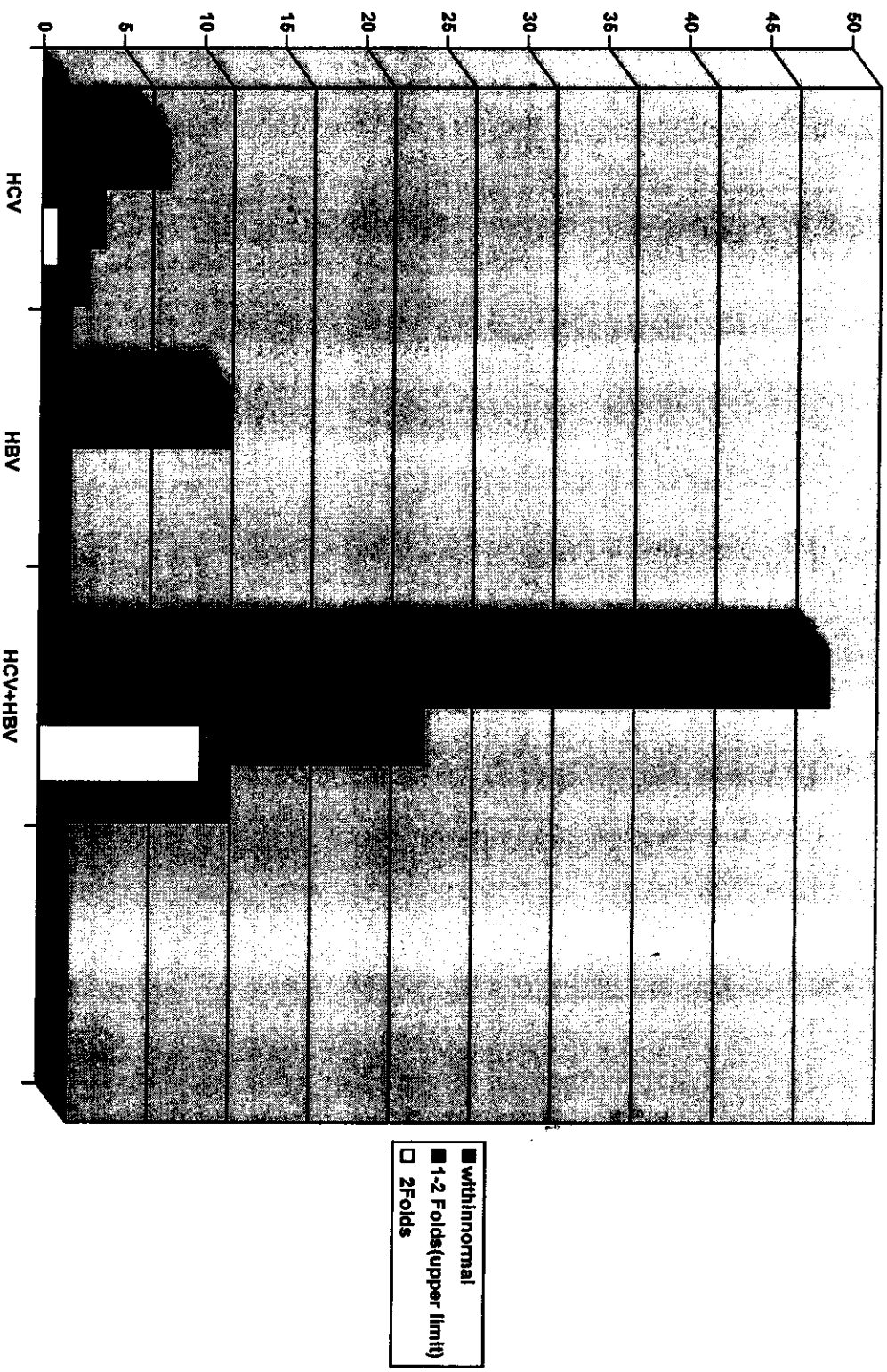


Figure (15): ALT levels according to types of viral hepatitis among group I.

Table (16):Relationship between HCV infection and HBsAg among patients groups.

HCV / HBsAg	HCV +ve		HCV -ve		Total
HBs Ag +ve	5	100	-		5
HBs Ag -ve	83	87.4	12	12.6	95
Total	88		12		100

Fisher exact test ***P> 0.05 non sign.***

Table (16): Showed the relation between HCV antibodies and HBsAg. HCV antibodies detected in the only 5 patients with seropositive HBsAg (5/100). This gives false impression that there is strong relation between HBsAg seropositive and HCV antibodies because 83 patients of HCV antibodies had seronegative HBsAg and there is no significant difference between them.

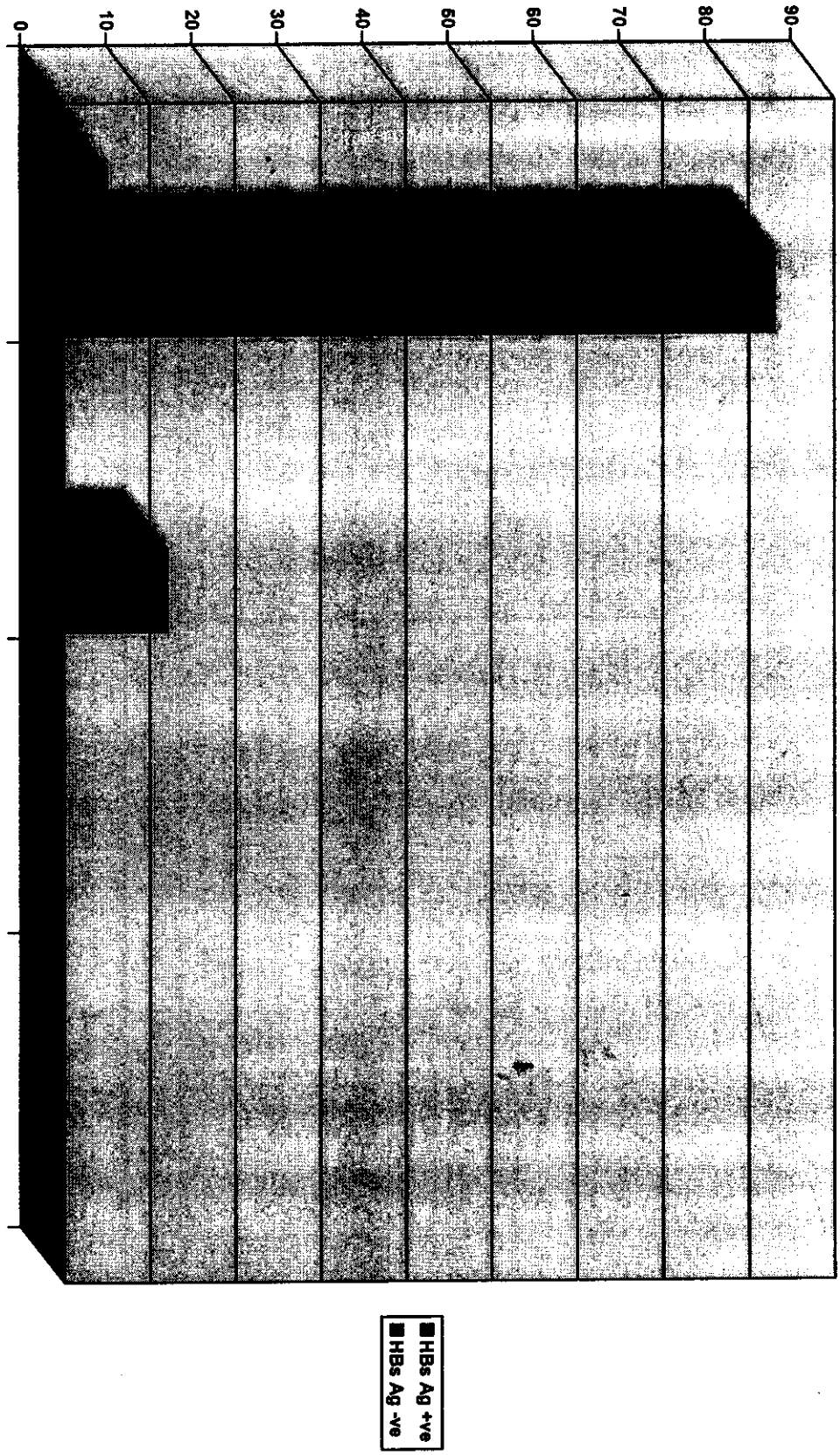


Figure (16): Relation between HBsAg and HCV antibody among group I.

Table (17):Relationship between HBsAg and HBsAb among patients groups.

HBs Ag / HBsAb	HBsAg+ve No.	%	HBsAg -ve No.	%	Total
HBsAb +ve	0	0	46	100	46
HBsAb -ve	5	9.3	49	90.7	54
Total	5		95		100

Fisher exact test ***P < 0.05 sign.***

Table(17):showed significant difference between HBsAg and HBsAb.

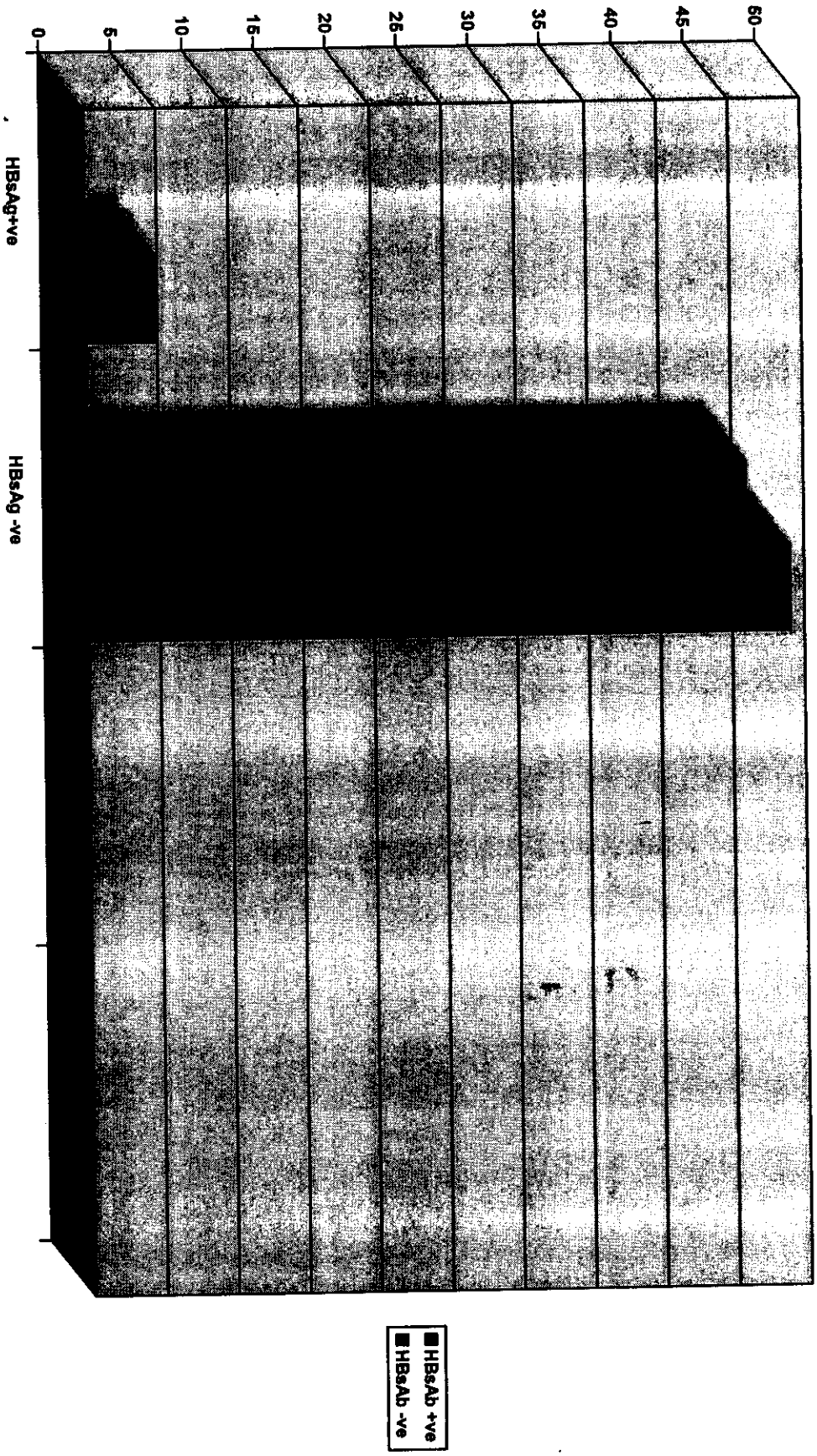
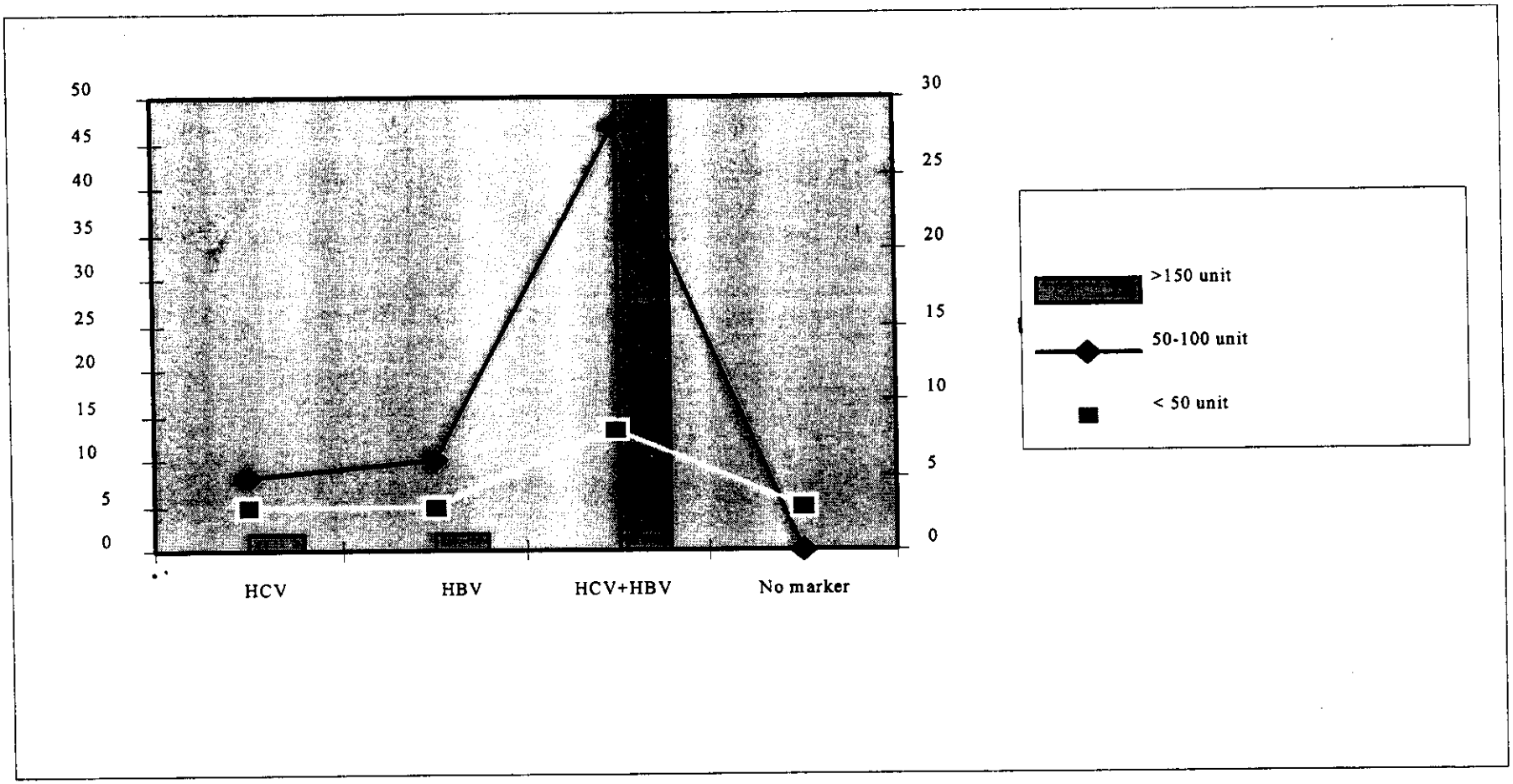


Figure (17): Relation between HBsAg and HBsAb antibody among patients group.

Table (18):Viral hepatitis serology in the multi-transfused groups according to No. of blood transfused units.

Hepatitis markers	*HCV*		*HBV*		*HCV+HBV*		*no marker*		*total*
No. Unit of blood	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	
>150 unit	*2*	*3.7*	*2*	*3.7*	*50*	*92.6*	*-*	*0*	*54*
50-100 unit	*5*	*12.8*	*6*	*15.4*	*28*	*71.8*	*-*	*0*	*39*
< 50 unit	*3*	*17.6*	*3*	*17.6*	*8*	*47.2*	*3*	*17.6*	*17*
Total	*10*		*11*		*86*		*3*		*110*

Table (18): Showed the more units of blood transfused to multi-transfused patients, the more prevalence of viral hepatitis infection. Where, combined HCV antibodies and HBV infection cases were more prevalent



Figure(18):Viral hepatitis serology in the multi-transfused groups according to No. of blood transfused units.