RESULTS

RESULTS

Age and sex distribution (Table V – Figure 12 & 13)

The present study was conducted on:

Group 1

Consisted of 30 normal healthy HCV negative controls, 27 males and 3 females with male to female ratio *9/1*. Their ages varied between 21and 69 years with a mean of 41 +/- 11.2 years.

Group 2

30 cases of chronic persistent hepatitis C, 28 males and 2 females with male to female ratio *14/1*. Their ages varied between 25 - 73 years with a mean of 41.56 +/- 10.0 years.

Group 3

30 cases of chronic active hepatitis C, 27 males and 3 females with male to female ratios *9/1*. Their ages varied between 22 and 74 years with a mean of 43.9 +/- 12.42 years.

HISTORY (Table VIa, VIb, VIc- Figure 14)

Group 2

History of schistosomiasis was found in 17 cases *(56.6%)*, 2 patients with positive family history for hepatitis C, and one patient had history of blood

transfusion. There was no past history of jaundice, alcohol intake, nor IV drug abuse.

Group 3

History of schistosomiasis was found in 23 cases *(76.6%),* 4 patients with positive family history for hepatitis C, and one patient had history of jaundice. There was no past history of blood transfusion, alcohol intake, nor IV drug abuse.

Table V: Age and sex distribution in-group 1 (control), group 2 (HCV-CPH) and group 3 (HCV-CAH).

	Group 1 (Total = 30)	Group 2 (Total = 30)	Group 3 (Total = 30)
SEX			
Male	27	28	27
Female	3	2	3
M/F ratio	*9 : 1*	*14 : 1*	*9 : 1*
AGE (years)			
Range	21 – 69	25 – 73	22 – 74
Mean	41	41.56	43.9
SEM +/-	11.2	10.0	12.42

SEM = Standard error of means. CPH = Chronic persistent hepatitis.

CAH = Chronic active hepatitis. M/F ratio = Male/Female ratio.

Table VIa: History of group 2 (CPH) patients

	Occupation	HISTORY							
		J.	Bl.Tran	Alc	IV Drug	Dialy	Schisto.	Sch.Tr.	Family His
1	Labor	-	-	-	-	-	-	-	-
2	Employer	-	-	-	-	-	-	-	+
3	Farmer	-	-	-	-	-	+(1/640)	IV	-
4	Farmer	-	-	-	-	-	+(1/1280)	IV	-
5	Physician	-	-	-	-	-	-	-	-
6	Farmer	-	-	-	-	-	+(1/ 640)	IV+Oral	-
7	Farmer	-	-	-	-	-	+ (1/ 80)	Oral	-
8	Farmer	-	-	-	-	-	+ (1/ 80)	IV	-
9	Employer	-	-	-	-	-	-	-	-
10	Labor	-	-	-	-	-	-	-	-
11	House wife	-	-	-	-	-	-	-	-
12	Farmer	-	-	-	-	-	+(1/ 160)	IV	-
13	Farmer	-	-	-	-	-	+ (1/80)	-	-
14	Labor	-	-	-	-	-	-	-	-
15	House wife	-	-	-	-	-	-	-	-
16	Farmer	-	-	-	-	-	+(1/ 160)	IV	+
17	Dentist	-	-	-	-	-	-	-	-
18	Farmer	-	-	-	-	-	+(1/1280)	IV+Oral	-
19	Labor	-	-	-	-	-	-	-	-
20	Labor	-	-	-	-	-	-	-	-
21	Employer	-	-	-	-	-	-	-	-
22	Farmer	-	-	-	-	-	+(1/ 640)	IV	-
23	Farmer	-	-	-	-	-	+(1/1280)	IV+Oral	-
24	Labor	-	-	-	-	-	-	-	-
25	Dentist	-	-	-	-	-	+(1/ 80)	Oral	-
26	Employer	-	-	-	-	-	+ (1/80)	-	-
27	Farmer	-	-	-	-	-	+ (1/ 80)	-	-
28	Employer	-	-	-	-	-	+(1/ 640)	IV	-
29	Labor	-	-	-	-	-	+ (1/ 80)	-	-
30	Farmer	-	-	-	-	-	+(1/5120)	IV+Oral	-

M = MALE. F = FEMALE. J = JUNDICE Bl. Tran = BLOOD TRANSFUSION
Alc. = ALCHOL Schisto. = SCHISTOSOMIASIS. Sch. Tre. = SCHISTOSOMAL TREATMENT. IV Drug = INTRAVENOUS DRUG ABUSE. - = NEGATIVE.
+ POSITIVE. Dial. = DIALYSIS. CPH = CHRONIC PERSISTENT HEPATITIS.
Family His = FAMILY HISTORY FOR HCV INFECTION.

N.B: DIAGNOSTIC TITRE FOR SCHISTOSOMIASIS 1/160.

Table VI b: History of group 3 (CAH) patients

	Occupation	HISTORY							
		J.	Bl.Tran	Alc	IV Drug	Dialy	Schisto.	Sch.Tr.	Family His
1	Employer	-	-	-	-	-	+ (1/1280)	IV	-
2	Pharmacist	-	-	-	-	-	+ (1/ 160)	IV	-
3	Farmer	-	-	-	-	-	+(1/ 1280)	IV+Oral	+
4	Farmer	-	-	-	-	-	+(1/ 640)	IV	+
5	Engineer	-	-	-	-	-	+(1/ 160)	IV	-
6	Farmer	-	-	-	-	-	+(1/ 1280)	IV+Oral	-
7	Labor	-	-	-	-	-	+ (1/ 80)	Oral	-
8	Employer	-	-	-	-	-	+ (1/ 160)	IV	-
9	Employer	-	-	-	-	-	-	-	-
10	Labor	-	-	-	-	-	+(1/ 640)	IV	-
11	Employer	-	-	-	-	-	+ (1/ 80)	IV	-
12	Labor	-	-	-	-	-	+(1/ 160)	IV	+
13	Student	-	-	-	-	-	-	-	-
14	House Wife	-	-	-	-	-	-	-	-
15	Farmer	-	-	-	-	-	+(1/ 160)	IV	-
16	House Wife	-	-	-	-	-	+(1/1280)	IV+Oral	+
17	House Wife	-	-	-	-	-	-	-	-
18	Farmer	-	-	-	-	-	+(1/ 640)	Oral	-
19	Employer	-	-	-	-	-	+(1/1280)	IV+Oral	-
20	Labor	-	-	-	-	-	+(1/ 640)	IV	-
21	Employer	-	-	-	-	-	-	-	-
22	House Wife	-	-	-	-	-	-	-	-
23	Physician	+	-	-	-	-	-	-	-
24	Pharmacist	-	-	-	-	-	+ (1/ 80)	-	-
25	Employer	-	-	-	-	-	+(1/ 640)	IV	-
26	Employer	-	-	-	-	-	+ (1/ 80)	-	-
27	Employer	-	-	-	-	-	+(1/5120)	IV+Oral	-
28	Farmer	-	-	-	-	-	+(1/5120)	IV+Oral	-
29	Labor	-	-	-	-	-	+(1/2560)	IV	-
30	Employer	-	-	-	-	-	+ (1/ 80)	Oral	-

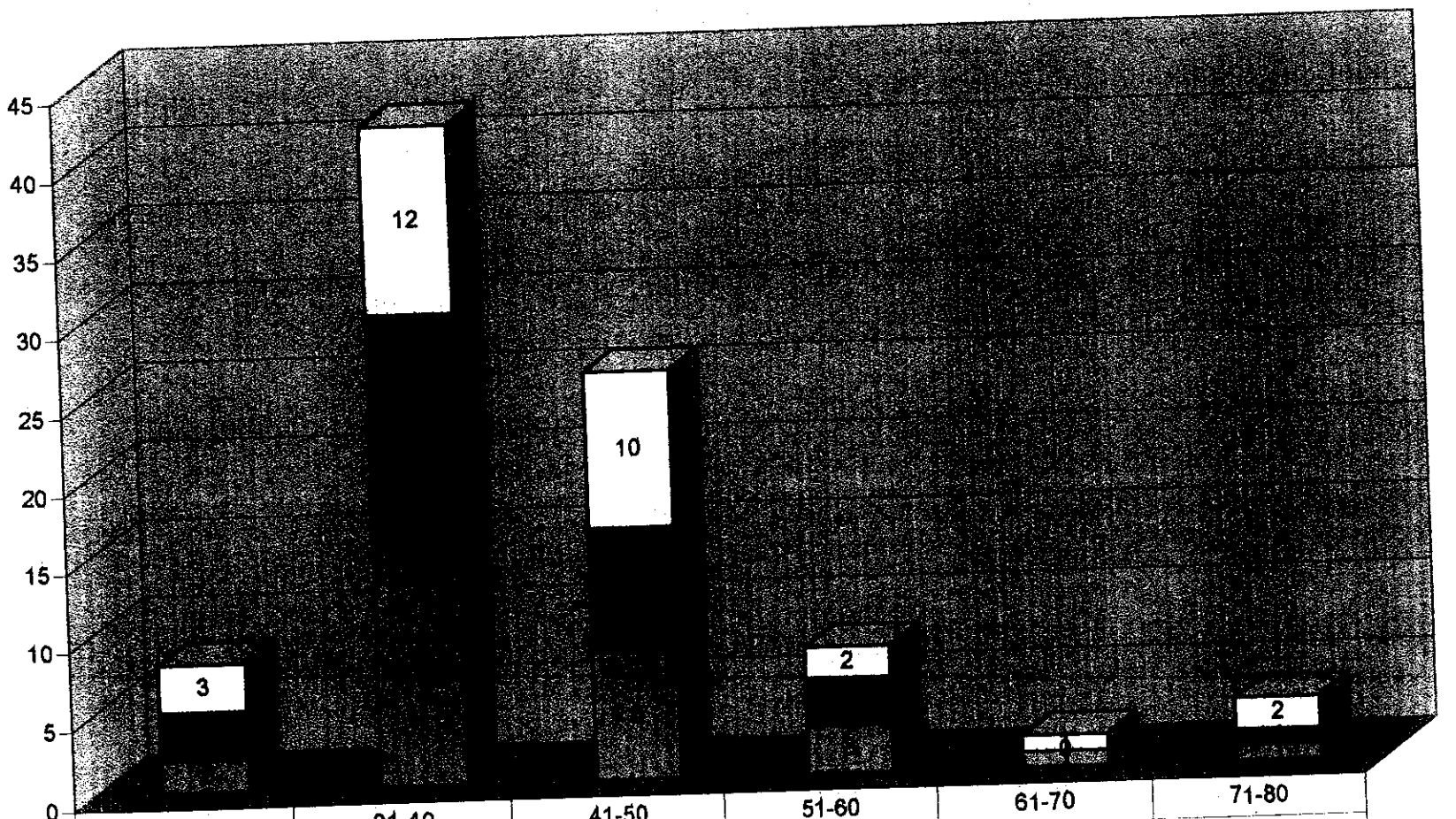
M = MALE. F = FEMALE. J = JUNDICE Bl. Tran = BLOOD TRANSFUSION
Alc. = ALCHOL Schisto. = SCHISTOSOMIASIS. Sch. Tre. = SCHISTOSOMAL TREATMENT. IV Drug = INTRAVENOUS DRUG ABUSE. - = NEGATIVE.
+ POSITIVE. Dial. = Dialysis. CAH = CHRONIC ACTIVE HEPATITIS.
Family His = FAMILY HISTORY FOR HCV INFECTION.

N.B: DIAGNOSTIC TITRE FOR SCHISTOSOMIASIS 1/160.

Table VIc: **Past history factors for group 2 (HCV-CPH) and group 3 (HCV-CAH)**

Factors of past history	Group 2		Group 3	
	no	%	no.	%
History of jaundice	0	0	1	3.3
History of blood transfusion	1	3.3	0	0
History of alcohol	0	0	0	0
History of IV abuse	0	0	0	0
History of dialysis	0	0	0	0
History of schistosomiasis	17	56.6	23	76.6
Family history for HCV	2	6.6	4	13.3

Figure 12: Age distribuation (years) in the three studied groups.



	20-30	31-40	41-50	51-60	61-70	71-80
GROUP 3	3	12	10	2	1	2
GROUP 2	3	15	8	3	0	1
GROUP 1	2	15	8	3	1	1

Figure 13 : Sex distribuation in the three studied groups.

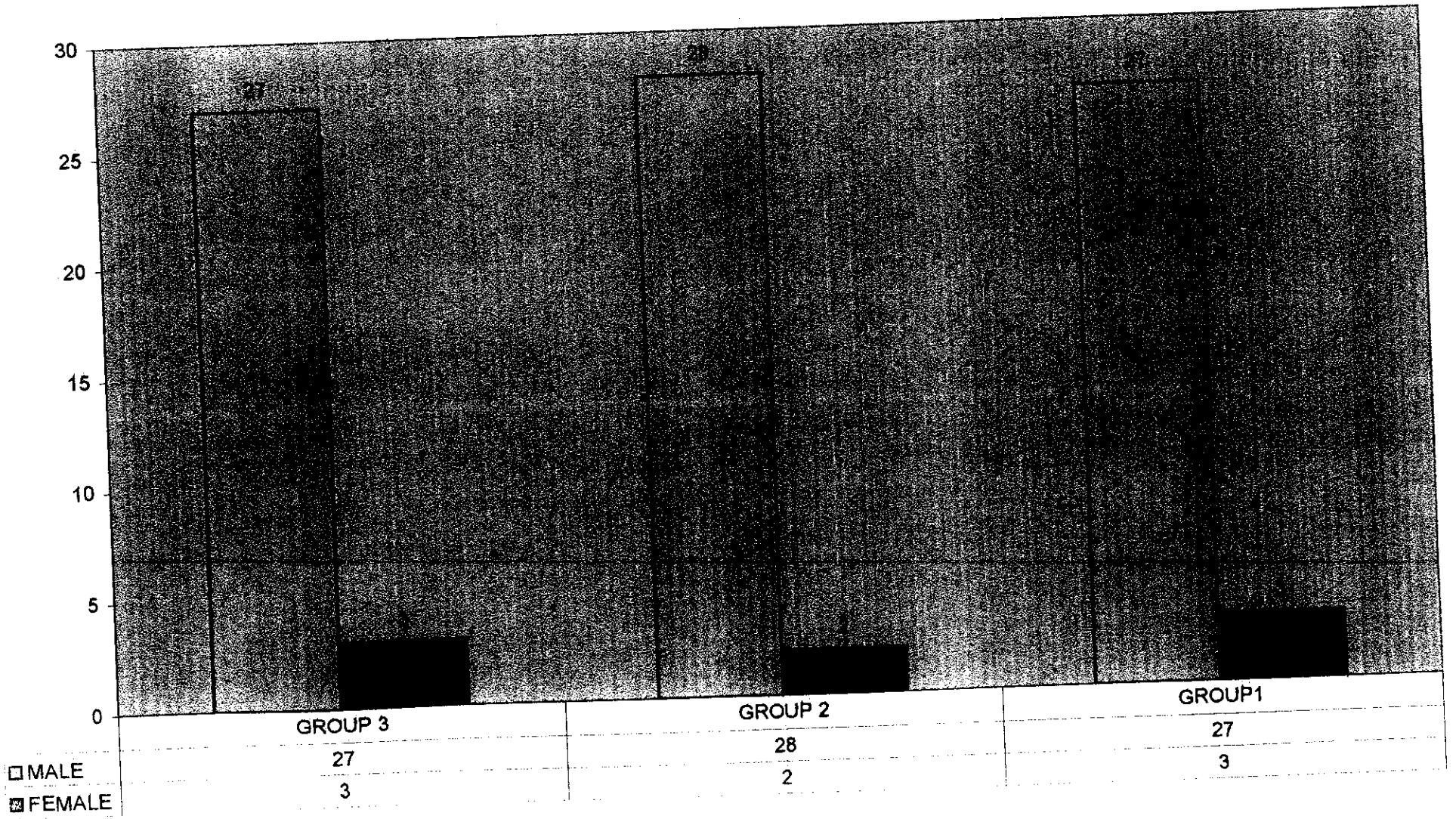
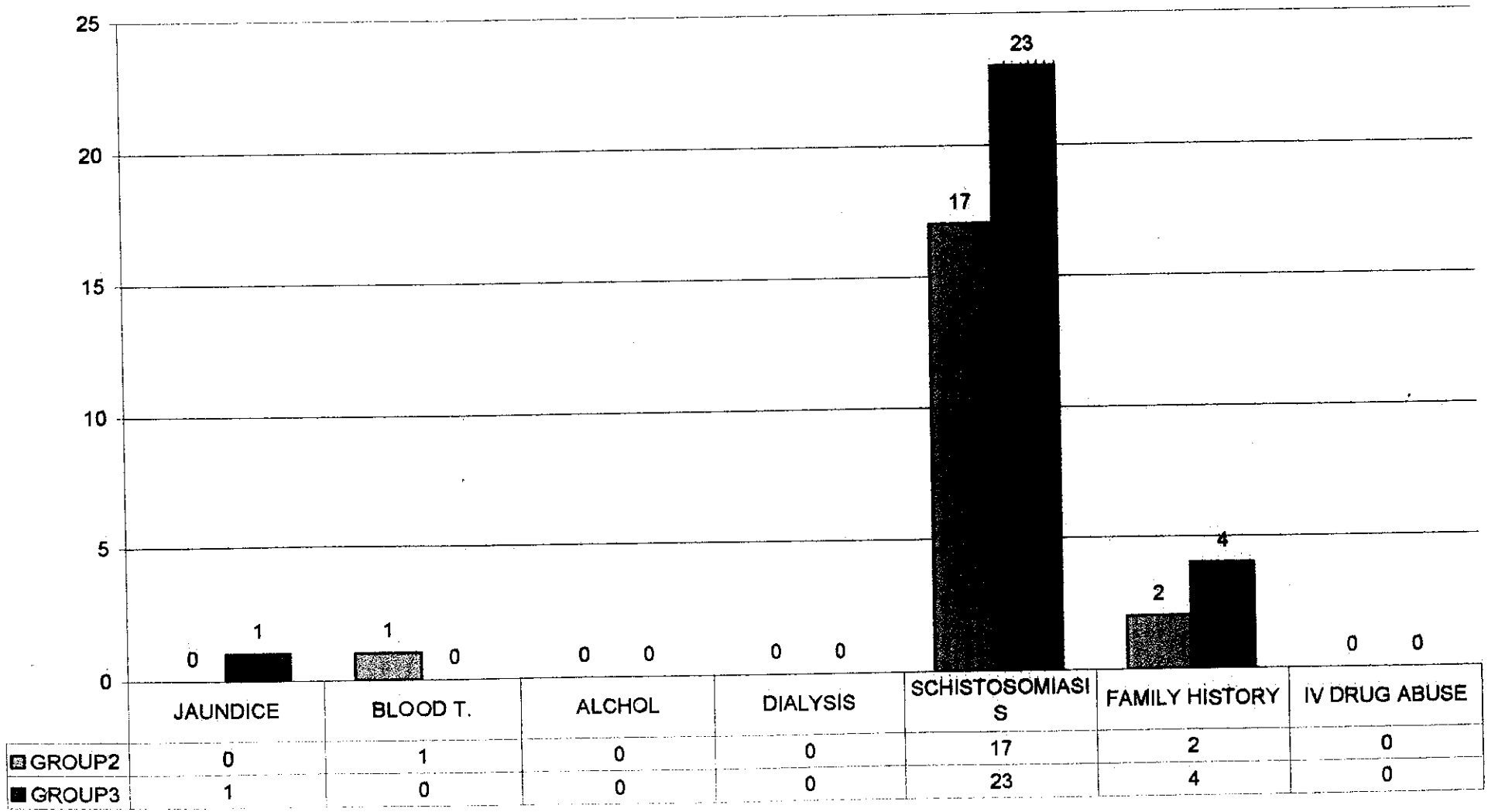


Figure 14: HISTORY OF GROUP 2 AND 3



	JAUNDICE	BLOOD T.	ALCHOL	DIALYSIS	SCHISTOSOMIASIS	FAMILY HISTORY	IV DRUG ABUSE
GROUP2	0	1	0	0	17	2	0
GROUP3	1	0	0	0	23	4	0

Clinical findings (Table VII)

Group 2 (Chronic persistent hepatitis)

Most of the patients were asymptomatic (60%) and the most common complain was easy fatigability (30%), dyspepsia (16.6 %) and right hypochondrial pain (10 %).

General examination revealed the presence of jaundice in (10%), pallor (3.3%), but no muscle wasting nor nail clubbing.

Hepatomegaly was found in 10 cases (33.3%), shrunken liver in one patient and splenomegaly was encountered in 12 patients (40%).

Group 3 (chronic active hepatitis)

Half of the patients were asymptomatic (50%) and the most common complain was easy fatigability (40%), dyspepsia (20 %) and right hypochondrial pain (20 %).

General examination revealed the presence of jaundice in 8 cases (26.6%), pallor in 2 cases (6.6%) but no muscle wasting nor nail clubbing.

Hepatomegaly was found in 9 cases (30%), shrunken liver in 3 patients (10%) and splenomegaly was encountered in 14 patients (40%).

Table VII : **Clinical findings in group 2 (HCV-CPH) and group 3 (HCV-CAH).**

Clinical findings	Group 2 no. (Total = 30)	%	Group 3 no. (Total = 30)	%
Symptoms:				
Asymptomatic	18	60	15	50
Easy fatigability	9	30	12	40
Dyspepsia	5	16.6	6	20
Left hypochondrial pain	0	0	0	0
Right hpochondrial pain	3	10	6	20
Haematemsis	0	0	0	0
Sings:				
Pallor	1	3.3	2	6.6
Jaundice	3	10	8	26.6
Nail clubbing	0	0	0	0
Muscle wasting	0	0	0	0
Liver				
Enlarged	10	33.3	9	30
Shrunken	1	3.3	3	10
Splenomegaly	12	40	14	46.6

LABORATORY FINDINGS

LIVER FUNCTION TESTS (Table VIII)

ALT (SGPT)

In control group it was between 3 and 22 U/L with a mean of 10.43 ± 4.55. In-group 2 the range was from 12 to 50 U/L with a mean of 28.30 ± 9.85.
In-group 3 the range was from 12 to 153 U/L with a mean of 57.06 ± 31.40. Statistical studies revealed that the mean values of ALT was **significant** ($p = 0.00$). When Scheffe test was applied it was found that it lies between group 1 (control) and group 2 (CPH- HCV), between group 1 (control) and group 3 (HCV-CAH), as well as between group 2 (HCV-CPH) and group 3 (HCV-CAH).

AST (SGOT)

In control group it was between 5 and 20 U/L with a mean of 11 ± 3.3. In-group 2 the range was from 10 to 35 U/L with a mean of 22.40 ± 7.92.
In -group 3 the range was from 13 to 113 U/L with a mean of 44.20 ± 24.48. Statistical studies revealed that the mean values of AST was **significant** ($p = 0.00$). When Scheffe test was applied it was found that it lies between group 1 (control) and group 2 (CPH- HCV), between group 1 (control) and group 3 (HCV-CAH), as well as between group 2 (HCV-CPH) and group 3 (HCV-CAH).

ALP (Alkaline phosphatase)

In control group it was between 60 and 170 U/L with a mean of 104.33 ± 30.82. In group 2 the range was from 78 to 200 U/L with a mean of 136.26 ± 30.39 . In- group 3 the range was from 66 to 378 U/L with a mean of 162.33 ± 66.43. Statistical studies revealed that the mean values of alkaline phosphatase was **significant** (p = 0.00). When Scheffe test was applied it was found that it lies between group 1 (control) and group 2 (CPH- HCV), as well as between group 1 (control) and group 3 (HCV-CAH).

Total Protein

In control group it was between 6.2 and 8 g/L with a mean of 7.21± 0.607. In- group 2 the range was from 6.3 to 8 g/L with a mean of 7.21 ± 0.42.
In- group 3 the range was from 4.6 to 8 g/L with a mean of 7.12 ± 0.71. Statistical studies revealed that the mean values of total protein was **non-significant** (p = 0.816).

Albumin

In control group it was between 3 and 5 g/L with a mean of 4.14 ± 0.568. In -group 2 the range was from 3 to 4.5 g/L with a mean of 3.37 ± 0.38.
In -group 3 the range was from 2 to 4.7 g/L with a mean of 3.78 ± 0.611. Statistical studies revealed that the mean values of albumin was **significant** (p = 0.0062). When Scheffe test was applied it was found

that it lies between group 1 (control) and group 2 (CPH- HCV), as well as between group 1 (control) and group 3 (HCV-CAH).

Total Bilirubin

In control group it was between 0.5 and 1.1 mg/dL with a mean of 0.87 ± 0.1856. In -group 2 the range was from 0.5 to 2.5 mg/dL with a mean of 1.454 ± 0.45. In-group 3 the range was from 0.7 to 2.3 mg/dL with a mean of 1.36 ± 0.47. Statistical studies revealed that the mean values of total bilirubin was **significant** ($p = 0.00$). When Scheffe test was applied it was found that it lies between group 1 (control) and group 2 (CPH- HCV), as well as between group 1 (control) and group 3 (HCV-CAH).

Prothrombin Activity

In control group it was between 85 % and 100 % with a mean of 92.3 % ± 5.60. In -group 2 the range was from 74% to 100 % with a mean of 87.23% ± 7.78. In -group 3 the range was from 64 % to 100 % with a mean of 85.56 % ± 7.16. Statistical studies revealed that the mean values of prothrombin activity was **significant** ($p = 0.0008$). When Scheffe test was applied it was found that it lies between group 1 (control) and group 2 (CPH- HCV), as well as between group 1 (control) and group 3 (HCV-CAH).

Table VIII : Liver function tests in group 1 (control) & group 2 (HCV-CPH) and group 3 (CAH- HCV).

	Bilirubin mg/dL	AST IU/L	ALT IU/L	ALP IU/L	Albumin g/dL	T. Protein g/dL	Prothrombin %
Group 1							
Range	0.5 - 1.1	5 – 20	3 – 22	60 – 170	3– 5	6.2 –8.0	85 – 100
Mean	0.87	11	10.43	104.33	4.14	7.21	92.3
SEM ±	0.185	3.3	4.55	30.82	0.56	0.60	5.6
Group 2							
Range	0.5 – 2.5	10 – 35	12 – 50	78 – 200	3 – 4.5	6.3 – 8	74 – 100
Mean	1.45	22.4	28.3	136.26	3.73	7.21	87.23
SEM ±	0.45	7.92	9.58	30.39	0.38	0.42	7.78
Group 3							
Range	0.7– 2.3	13- 113	12–153	66-378	2 – 4.7	4.6 – 8.5	64 – 100
Mean	1.36	44.2	57.06	162.43	3.78	7.12	86
SEM ±	0.47	24.47	31.40	66.43	0.611	0.71	7.16
F value	18.90	38.06	45.33	12.08	5.39	0.20	7.71
t test	0.00	0.00	0.00	0.00	0.0062	0.816	0.0008

AST = Aspartate aminotransferase. ALT = Alanine aminotransferase.
ALP = Alkaline phosphatase. Significant if $p < 0.05$

COMPLETE BLOOD COUNT (Table IX)

Hemoglobin

In control group it was between 12.8 and 16 g/dL with a mean of 14.52 ± 0.89. In- group 2 the range was from 12.6 to 16 with a mean of 14.23 ± 0.86.
In -group 3 the range was from 12.4 to 16.8 with a mean of 14.63 ± 1.1. Statistical studies revealed that the mean values of hemoglobin was **non-significant** (p = 0.2621).

Red blood cells

In control group it was between 3.4 and 5.98 X 10 / cumm with a mean of 4.87 ± 0.72. In-group 2 the range was from 3.56 to 5.98 with a mean of 4.83 ± 0.79.
In -group 3 the range was from 4.05 to 5.76 with a mean of 4.93 ± 0.54. Statistical studies revealed that the mean values of RBCs was **non-significant** (p = 0.8528).

White blood cells

In control group it was between 4.2 X 10 cumm and 8.2 with a mean of 6.11 ± 0.97. In -group 2 the range was from 3.9 to 9 with a mean of 6.29 ± 1.16.
In- group 3 the range was from 2.1 to 10.9 with a mean of 6.53 ± 2.18. Statistical studies revealed that the mean values of WBCs was **non- significant** (p = 0.5668).

Platelets count

In control group it was between 159 and 340 X 10 / cumm with a mean of 207.86 ± 45.3. In-group 2 the range was from 120 to 320 with a mean of 181.16 ± 46.95. In -group 3 the range was from 76 to 334 with a mean of 155.8 ± 66.15. Statistical studies revealed that the mean values of platelets was **significant** (p = 0.0014). When Scheffe test was applied it was found that it lies between group 1 (control) and group 3 (HCV-CAH).

Neutrophils

In control group it was between 48% and 76 % with a mean of 62.6 ± 6.06. In -group 2 the range was from 45 % to 77 % with a mean of 60.73 ± 7.08.
In- group 3 the range was from 50 % to 70 %with a mean of 64.26 ± 4.29. Statistical studies revealed that the mean values of neutrophils was **non-significant** (p = 0.0751).

Lymphocytes

In control group it was between 22 %and 45 % with a mean of 33.8 ± 5.18. In- group 2 the range was from 21% to 50% with a mean of 34.80 ± 6.40.
In- group 3 the range was from 23% to 40% with a mean of 31.30 ± 3.64. Statistical studies revealed that the mean values of lymphocytes was **significant** (p = 0.0315). When Scheffe test was applied it was found that it lies between group 2 (CPH- HCV) and group 3 (HCV-CAH).

Monocytes

In control group it was between 0 % and 5% with a mean of 1.73 ± 1.38. In- group 2 the range was from 0% to 7 % with a mean of 2.2 ± 2.02.
In- group 3 the range was from 0% to 9% with a mean of 2.36 ± 1.84. Statistical studies revealed that the mean values of monocytes was **non-significant** (p = 0.3620).

Eosinophils

In control group it was between 0% and 3% with a mean of 1.3 ± 0.95. In- group 2 the range was from 0% to 4% with a mean of 2.10 ± 0.99.
In -group 3 the range was from 0% to 3% with a mean of 1.76 ± 0.89. Statistical studies revealed that the mean values of eosinophils was **significant** (p = 0.0063). When Scheffe test was applied it was found that the lies between group 1 (control) and group 3 (HCV-CPH).

Basophiles

In control group it was between 0% and 2% with a mean of 0.26 ± 0.52. In -group 2 the range was from 0% to 1% with a mean of 0.1 ± 0.30.
In- group 3 the range was from 0% to 1% with a mean of 0.133 ± 0.434. Statistical studies revealed that the mean values of basophiles was **non-significant** (p = 0.2871).

Table IX: **Complete blood count of group 1 (controls), group 2 (HCV-CPH) and group 3 (HCV-CAH)**

	Hb. g/dL	RBCs (10/cumm)	WBCs (10/cumm)	Platelets (10/cumm)	Neut. %	Lymph. %	Eo. %	Bas. %	Mono %
Group 1									
Range	12.8 – 16	3.4 – 5.98	4.2 – 8.2	159 – 340	48– 76	22 – 45	0 – 3	0 – 2	0 – 5
Mean	14.52	4.87	6.11	207.86	62.6	33.8	1.3	0.26	1.73
SEM ±	0.89	0.72	0.97	45.3	6.06	5.18	0.95	0.52	1.38
Group 2									
Range	12.6 – 16	3.56 – 5.98	3.9 – 9	120 – 320	45 – 77	21 – 50	0 – 4	0 – 1	0 – 7
Mean	14.23	4.83	6.29	181.16	60.73	37.71	2.10	0.10	2.20
SEM ±	0.86	0.79	1.16	46.95	7.08	6.40	0.99	0.30	2.02
Group 3									
Range	12.4 -16.8	4.05 –5.90	2.1 – 10.9	76 – 334	50 – 70	23 – 40	0 – 3	0 – 2	0 – 9
Mean	14.63	4.93	6.53	155.8	64.26	31.30	1.76	0.133	2.36
SEM ±	1.1	0.54	2.18	66.15	4.29	3.64	0.89	0.434	1.84
F value	0.26	0.15	0.57	7.06	2.66	3.95	5.37	1.26	1.02
T test	1.35	0.8528	0.56	0.0014	0.07	0.031	0.00	0.28	0.36

Significant if $p < 0.05$

SERUM IRON (Table Xa – Figure 15)

In control group it was between 60 to 161 μg/mL with a mean of 92.43 ± 22.73. In- group 2 the range was from 44 to 131 with a mean of 85.63 ± 22.47.
In- group 3 the range was from 49.6 to 243 with a mean of 123.28 ± 48.3. Statistical studies revealed that the mean values of iron was **significant** ($p = 0.0001$). When Scheffe test was applied it was found that it lies between group 1 (control) and group 3 (CAH- HCV), as well as between group 2 (CPH- HCV) and group 3 (HCV-CAH).

Correlation coefficient of serum **iron** and **ALT** (SGPT) was done between the three studied groups (Table Xb- Figure 15b) and it was found that there was **negative** correlation between iron and ALT (SGPT) in **- group 1** i.e. control group ($r = - 0.001$) and it was **non significant** ($p = 0.993$). Also there was **negative** correlation coefficient between iron and ALT (SGPT) in-**group 2** i.e. (CPH) group ($r = - 0.0944$) and it was **non -significant** ($p = 0.620$). In-**group 3** (CAH) there was **positive** correlation coefficient ($r = 0.4774$) and it was **significant** ($p = 0.008$).

ALPHA-FETOPROTEIN (Table XI – Figure 16)

In control group it was between 0 and 5 ng/mL with a mean of 1.46 ± 1.11. In -group 2 the range was from 0.5 to 9 with a mean of 2.97 ± 2.33.
In -group 3 the range was from 0.9 to 29 with a mean of 6.19 ± 6.66. Statistical studies revealed that the mean values of AFP was **significant** ($p = 0.0001$). When Scheffe test was applied it was found that it lies between group 1 (control) and group 3 (CAH- HCV), as well as between group 2 (CPH- HCV) and group 3 (HCV-CAH).

Table Xa : **Serum iron of group 1 (controls), group 2 (HCV-CPH) and group 3 (HCV-CAH)**

	SERUM IRON (*ug*/ dL)
Group 1	
Range	60 – 161
Mean	92.43
SEM ±	22.73
Group 2	
Range	44 – 131
Mean	85.63
SEM ±	22.47
Group 3	
Range	49.6 – 243
Mean	123.28
SEM ±	48.3
F value	7.51
t test	0.0081

Significant if $p < 0.05$

Table Xb: Correlation coefficient between serum iron and ALT (SGPT) in the three studied groups.

	Group 1(control)	Group 2 (CPH)	Group 3 (CAH)
n	30	30	30
r	- 0.0017	- 0.0944	0.4774
p	- 0.993	- 0.620	0.008

ALT = Alanine aminotransferase.

n = number of cases.

r = correlation coefficient.

p = p-value.

Table Xb: Correlation coefficient between serum iron and ALT (SGPT) in the three studied groups.

	Group 1(control)	Group 2 (CPH)	Group 3 (CAH)
n	30	30	30
r	- 0.0017	- 0.0944	0.4774
p	- 0.993	- 0.620	0.008

ALT = Alanine aminotransferase.

n = number of cases.

r = correlation coefficient.

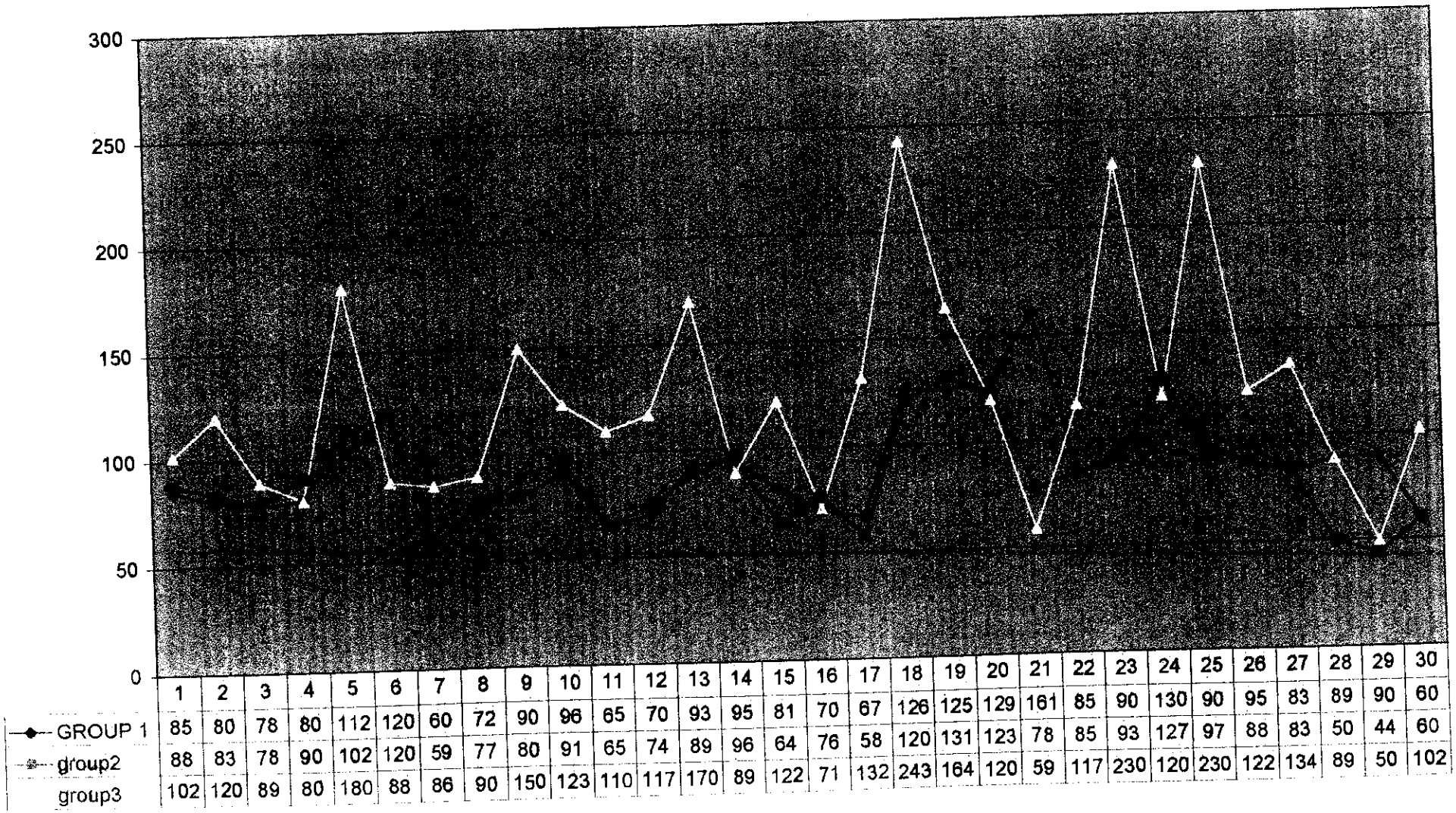
p = p-value.

Table XI: Alpha-fetoprotein of group 1 (controls), group 2 (HCV-CPH) and group 3 (HCV-CAH).

	ALPHA-FETO PROTEIN (ng/mL)
Group 1	
Range	0 – 5
Mean	1.46
SEM±	1.11
Group 2	
Range	0.5 – 9
Mean	2.97
SEM ±	2.33
Group 3	
Range	0.9 – 29
Mean	6.19
SEM ±	6.66
F value	10.26
t test	0.0001

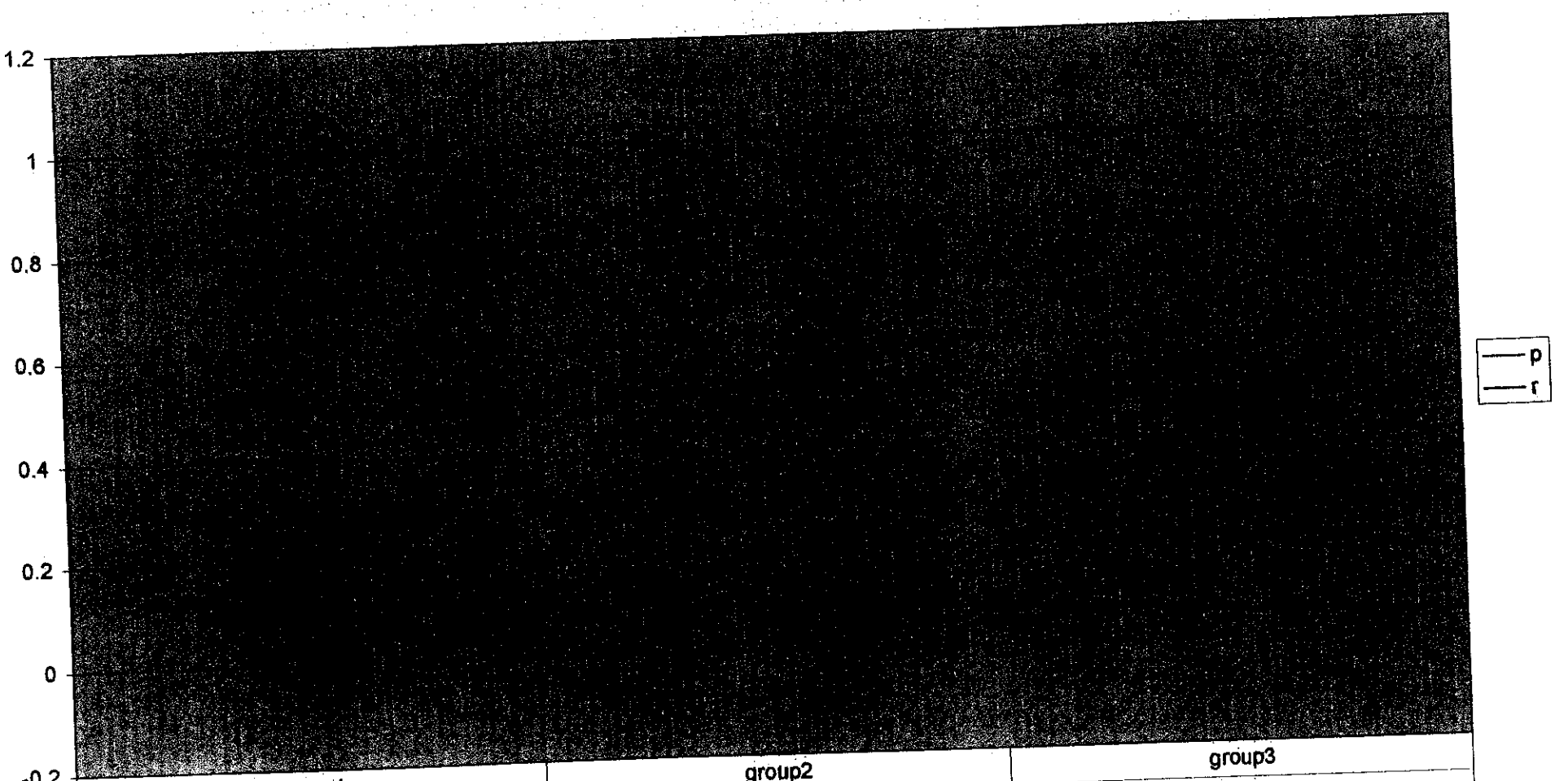
Significant if $p < 0.05$

Figure 15a : Iron level in the three studied groups



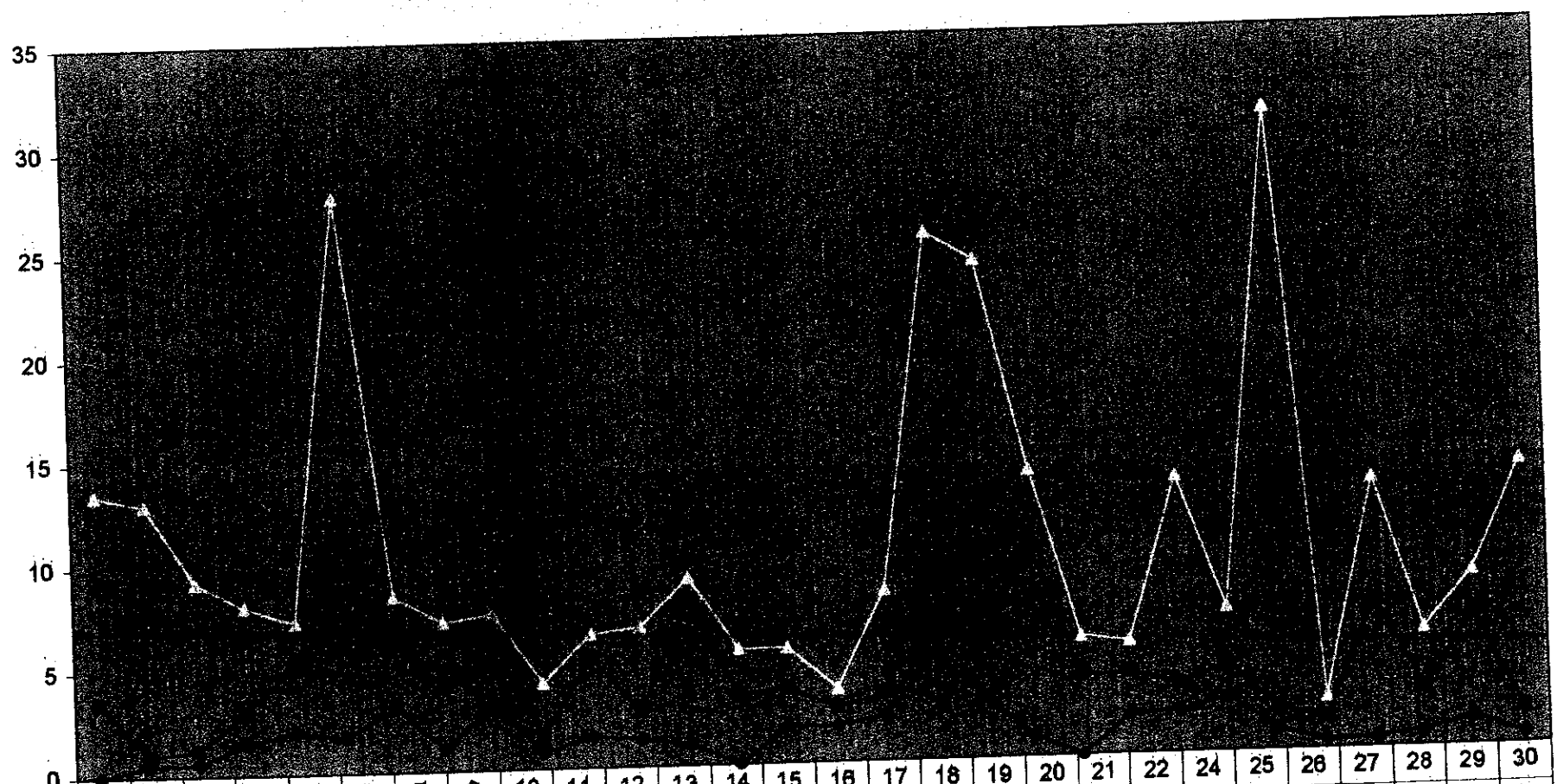
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
GROUP 1	85	80	78	80	112	120	60	72	90	96	65	70	93	95	81	70	67	126	125	129	161	85	90	130	90	95	83	89	90	60
group2	88	83	78	90	102	120	59	77	80	91	65	74	89	96	64	76	58	120	131	123	78	85	93	127	97	88	83	50	44	60
group3	102	120	89	80	180	88	86	90	150	123	110	117	170	89	122	71	132	243	164	120	59	117	230	120	230	122	134	89	50	102

Figure 15 b: Correlation Coefficient between iron and ALT in the three studied groups



	group1	group2	group3
p	0.993	0.62	0.008
r	-0.0017	-0.0944	0.4774

Figure 16 : Alpha-fetoprotein level in the three studied groups



	1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	24	25	26	27	28	29	30
GROUP3	10	12	8	5	2	17	2.2	1.3	2.5	1.1	4	1	2.2	1.9	0.9	5	16	18	3.8	1.9	1.5	2.7	29	1	5.9	2.9	2	12
GROUP2	3.5	0.5	0.6	1.5	3.2	9	3.1	3.1	0.8	3.78	1.34	7	3.3	1.8	0.9	1	4.4	3	9	3.8	2	1.6	1	1.1	6.6	2	5	1.2
GROUP I	0	0.5	0.6	1.5	2	1.7	3.1	3.1	0.8	1.5	1.34	1	0	1.8	1.7	2.2	5	3	1	0	1.9	2.6	1	0.4	0.5	0.78	1.4	0.5

HISTOPATHOLOGY

Group 2 patients (chronic persistent hepatitis):

Liver pathology of these patients was characterized by round cell infiltration of the portal tracts without invasion of the hepatic lobules. The limiting plates of the lobules remained intact and there was no evidence of piece meal necrosis. No fibrosis was detected and the normal hepatic architecture was preserved (Figure 17).

Group 3 patients (chronic active hepatitis):

Liver pathology of these patients was characterized by roundcell infiltration of the portal tracts with invasion of the hepatic lobules, piece meal necrosis and erosion of the limiting plates (Figure 18).

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ULTRASOUND

Most of patients had normal abdominal ultrasound with normal sized liver and spleen, in group 2 HCV-CPH 10 patients (33.3%) had hepatomegaly and 12 from 30 (40%) had splenomegaly. In group 3 HCV-CAH (index cases) there was 9 patients (30%) had hepatomegaly and 14 patients with splenomegaly (46.4%) (Figure 19a and 19b).

Figure 19a: Abdominal ultrasound for patient with group 3 HCV-CAH (index cases) showing homogenous hepatic parenchymal echopattern with coarse echobands seen within the liver, moderate degree of liver cirrhosis, post-hepatitic.

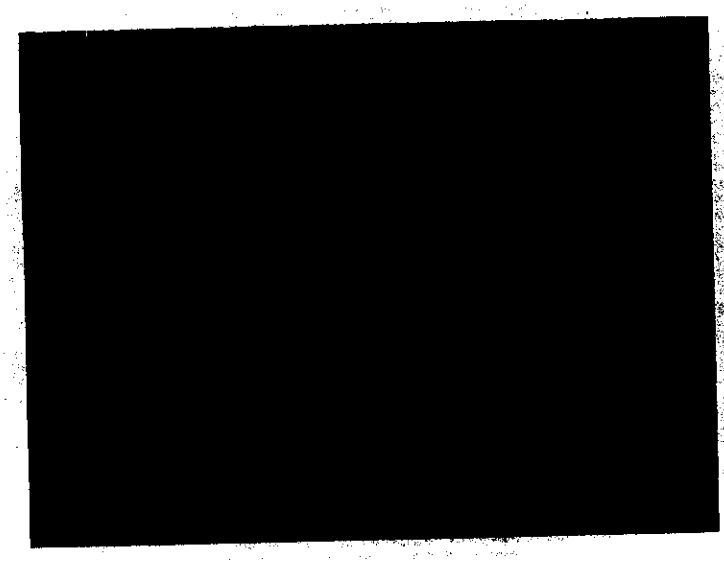


Figure 19b: Abdominal ultrasound for patient with group 3 HCV-CAH (index cases) showing mild degree of splenomegaly.

HLA TYPING

HLA typing by microcytotoxicity has been done for the three studied groups (group 1 = control, group 2 = HCV-CPH and group 3 = HCV-CAH).

Distribution of class I HLA-A antigens

(Table XII, Figure 20) in the **control group** HLA-*A1* 10% - *A2* 13.3% - *A3* 3.3% - *A11* 13.3% -*A23* 3.3% - *A24* 23.3% - *A26* 10% - *A28* 3.3% - *A29* 10% - *A30* 13.3% - *A31* 10% - *A32* 16.6% - *A33* 16.6 – *A68* 10%.

While in **HCV-CPH (group 2)** HLA - *A1* 20% - *A2* 53.3% - *A3* 6.6% - *A11* 26.6% -*A23* 6.6% - *A24* 10% - *A26* 16.6% - *A28* 3.3% - *A29* 6.6% - *A30* 3.3% - *A31* 6.6% - *A32* 16.6% - *A33* 6.6 – *A68* 0%.

In **HCV-CAH (group 3)** HLA- *A1* 20% - *A2* 53.3% - *A3* 6.6% - *A11* 26.6% -*A23* 6.6% - *A24* 10% - *A26* 16.6% - *A28* 3.3% - *A29* 6.6% - *A30* 3.3% - *A31* 6.6% - *A32* 16.6% - *A33* 6.6 – *A68* 0%.

Distribution of class I HLA-B antigens

(Table XIII, Figures 21) in the **control group** HLA-*B7* 10% - *B8* 13.3% - *B13* 6.6% - *B14* 0% - *B15* 3.3% - *B18* 3.3% - *B35* 23.3% - *B37* 6.6% - *B38* 13.3% - *B39* 3.3% - *B41* 6.6% - *B42* 3.3% - *B44* 3.3 % – *B45* 0% - *B49* 0% - *B50* 6.6% - *B51* 13.3% - *B52* 3.3% - *B53* 10% - *B55* 3.3% - *B57* 6.6% - *B62* 0% - *B63* 6.6% - *B65* 10% - *B70* 3.3% - *B73* 3.3% - *B76* 3.3% - *B77* 0%

In group 2 HCV-CPH HLA-*B7* 3.3% - *B8* 0% - *B13* 6.6% - *B14* 3.3% - *B15* 3.3% - *B18* 0% - *B35* 10% - *B37* 0% - *B38* 10% - *B39* 3.3% - *B41* 16.6% - *B42* 0% - *B44* 6.6% – *B45* 3.3% - *B49* 6.6% - *B50* 6.6% - *B51* 13.3% - *B52* 10% - *B53* 3.3% - *B55* 10% - *B57* 0% - *B62* 10% - *B63* 13.3% - *B65* 3.3% - *B70* 0% - *B73* 0% - *B76* 0% - *B77* 0%.

In group 3 HCV-CAH HLA-*B7* 6.6% - *B8* 3.3% - *B13* 6.6% - *B14* 10% - *B15* 0% - *B18* 3.3% - *B35* 13.3% - *B37* 3.3% - *B38* 13.3% - *B39* 3.3% - *B41* 20.6% - *B42* 0% - *B44* 6.6% – *B45* 3.3% - *B49* 10% - *B50* 6.6% - *B51* 6.6% - *B52* 10% - *B53* 0% - *B55* 13.3% - *B57* 0% - *B62* 6.6% - *B63* 16.6% - *B65* 3.3% - *B70* 0% - *B73* 0% - *B76* 0% - *B77* 3.3% .

Distribution of class I HLA-C antigens

(Table XIV, Figures 22) **in the control group** HLA-*Cw1* 6.6% - *Cw2* 0% - *Cw3* 6.6% - *Cw4* 23.3% - *Cw5* 0% - *Cw6* 13.3% - *Cw7* 43.3% - *Cw8* 20% - *CwX* 20%.

In the **group 2 HCV-CPH** HLA-*Cw1* 6.6% - *Cw2* 10% - *Cw3* 6.6% - *Cw4* 13.3% - *Cw5* 3.3% - *Cw6* 3.3% - *Cw7* 33.3% - *Cw8* 0% - *CwX* 26.6%.

In the **group 3 HCV-CAH** HLA-*Cw1* 10% - *Cw2* 10% - *Cw3* 6.6% - *Cw4* 10% - *Cw5* 3.3% - *Cw6* 3.3% - *Cw7* 36.6% - *Cw8* 3.3% - *CwX* 20.3%.

Distribution of class II HLA-DR antigens

(Table XV, Figures 23) in **the control group** HLA-*DR1* 6.6% - *DR2* 13.3% - *DR3* 16.6% - *DR4* 30% - *DR7* 23.3% - *DR8* 13.3% - *DR9* 3.3% - *DR10* 13.3% - *DR11* 10% - *DR12* 13.3% - *DR13* 40% - *DR14* 3.3% - *DR15* 16.6% – *DR16* 3.3% - *DR138* 3.3%.

While in **group 2 HCV-CPH** HLA-*DR1* 6.6% - *DR2* 43.3% - *DR3* 3.3% - *DR4* 40% -*DR7* 23.3% - *DR8* 10% - *DR9* 6.6% - *DR10* 6.6% - *DR11* 23.3% - *DR12* 0% - *DR13* 26.6% - *DR14* 6.6% - *DR15* 20% – *DR16* 3.3% - *DR138* 0%.

In **group 3 HCV-CAH** HLA-*DR1* 6.6% - *DR2* 3.3% - *DR3* 60% - *DR4* 26.6% -*DR7* 13.3% - *DR8* 6.6% - *DR9* 0% - *DR10* 3.3% - *DR11* 16.6% - *DR12* 0% - *DR13* 26.6% - *DR14* 10% - *DR15* 23.3% – *DR16* 3.3% - *DR138* 0%.

Distribution of class II HLA-DQ antigens

(Table XVI, Figures 24) in **the control group** HLA *DQ1* 76.6% - *DQ2* 23.3% - *DQ3* 40% - *DQ4* 0% - *DQ6* 40% - *DQ7* 20% - *DQ8* 3.3 %.

While in **group 2 HCV-CPH** HLA-*DQ1* 83.3% - *DQ2* 33.3% - *DQ3* 23.3% - *DQ4* 6.6% - *DQ6* 43.3% - *DQ7* 0% - *DQ8* 3.3%.

In **group 3 HCV-CAH** HLA-*DQ1* 73.3% - *DQ2* 43.3% - *DQ3* 26.6% - *DQ4* 3.3% - *DQ6* 43.3% - *DQ7* 0% - *DQ8* 0%.

When comparison between patients had *HLA-A2* and patients had not *HLA-A2* in *group 3* (Table XVII) for Liver function tests (ALT – AST – ALP – prothrombin activity – bilirubin – albumin – total protein), platelets and AFP it was **non- significant** ($p > 0.05$).

When comparison between patients had *HLA-A2* and patients had not *HLA-A2* in *group 3* (Table XVII) and serum **iron** the comparison was **significant** ($p = 0.024$).

Also comparison between patients had *HLA-DR3* and patients had not *HLA-DR3* in *group 3* (Table XVIII) for liver function tests (ALT – AST – ALP – prothrombin activity – bilirubin – albumin – total protein), iron, platelets and AFP it was **non-significant** ($p> 0.05$).

Table XII : Distribution of class I HLA-A antigens in group 1 (controls), group 2 (HCV-CPH) and group 3 (HCV-CAH).

Antigen	Group 1		Group 2		Group 3	
	no.	%	no.	%	no.	%
A1	3	10	6	20	7	23.3
A2	4	13.3	16	53.3	15	50
A3	1	3.3	2	6.6	2	6.6
A11	4	13.3	8	26.6	7	23.3
A23	1	3.3	2	6.6	2	6.6
A24	7	23.3	3	10	4	13.3
A26	3	10	5	16.6	3	10
A28	1	3.3	1	3.3	0	0
A29	3	10	2	6.6	2	6.6
A30	4	13.3	1	3.3	1	3.3
A31	3	10	2	6.6	3	10
A32	5	16.6	5	16.6	4	13.3
A33	5	16.6	2	6.6	2	6.6
A68	3	10	0	0	0	0

Table XIV: **Distribution of class I HLA-C antigens in group 1 (controls), group 2 (HCV-CPH) and group 3 (HCV-CAH).**

Antigen	Group 1		Group 2		Group 3	
	no.	%	no.	%	no.	%
Cw1	2	6.6	2	6.6	3	10
Cw2	0	0	3	10	3	10
Cw3	2	6.6	2	6.6	2	6.6
Cw4	7	23.3	4	13.3	3	10
Cw5	0	0	1	3.3	1	3.3
Cw6	4	13.3	1	3.3	1	3.3
Cw7	13	43.3	10	33.3	11	36.6
Cw8	2	6.6	0	0	1	3.3
CwX	6	20	8	26.6	7	23.3

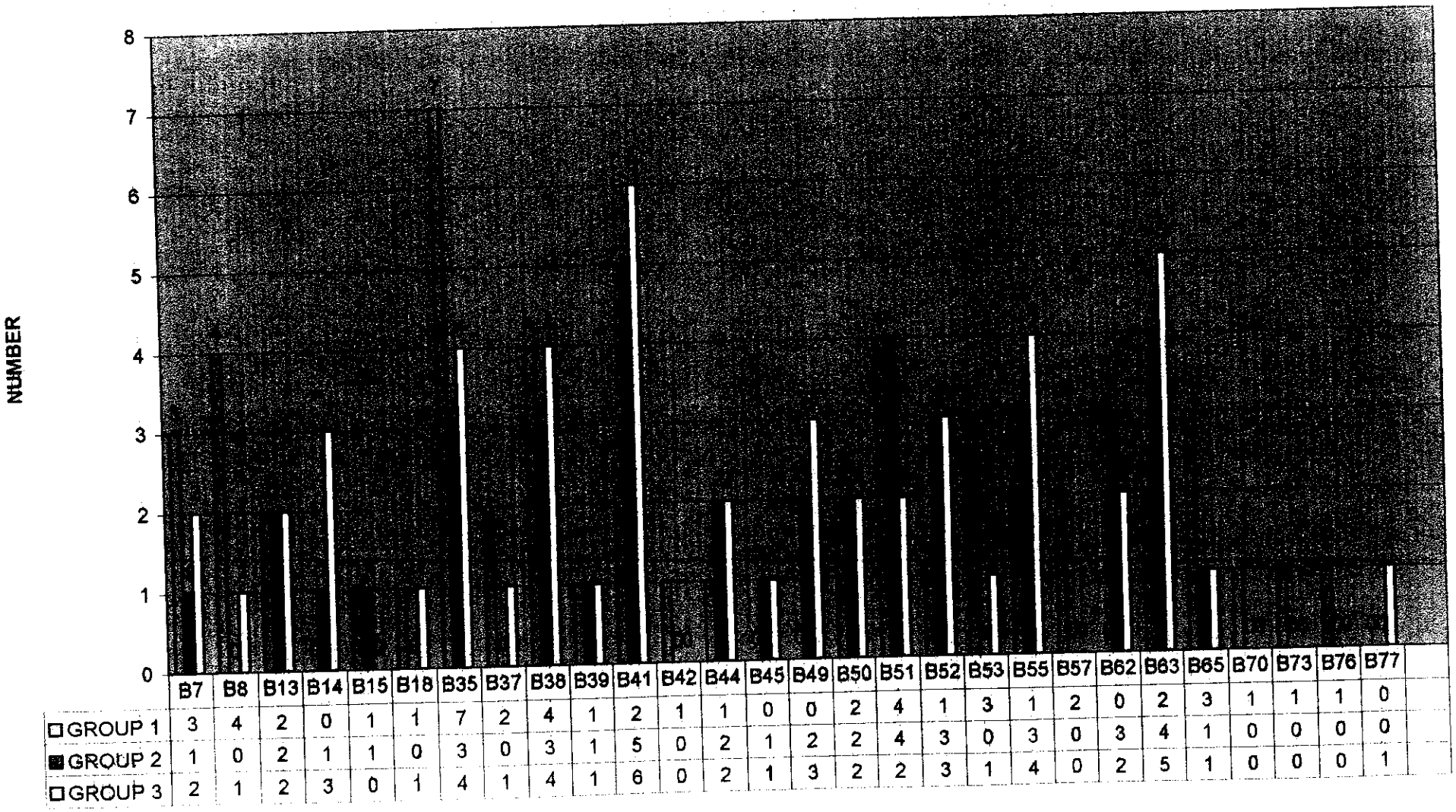
Table XV: Distribution of class II HLA-DR antigens in group 1 (controls), group 2 (HCV-CPH) and group 3 (CAH -HCV).

Antigen	Group 1		Group 2		Group 3	
	no.	%	no.	%	no.	%
DR1	2	6.6	2	6.6	2	6.6
DR2	3	10	13	43.3	1	3.3
DR3	4	13.3	1	3.3	18	60
DR4	9	30	12	40	8	26.6
DR7	7	23.5	7	23.5	4	13.3
DR8	4	13.3	3	10	2	6.6
DR9	1	3.3	2	6.6	0	0
DR10	4	13.3	2	6.6	1	3.3
DR11	3	10	7	23.5	5	16.6
DR12	4	13.3	0	0	0	0
DR13	12	40	8	26.6	8	26.6
DR14	1	3.3	2	6.6	3	10
DR15	5	16.6	6	20	7	23.3
DR16	1	3.3	1	3.3	1	3.3
DR138	1	3.3	0	0	0	0

Table XVI: Distribution of class II HLA-DQ antigens in group 1 (controls), group 2 (HCV-CPH) and group 3 (CAH -HCV).

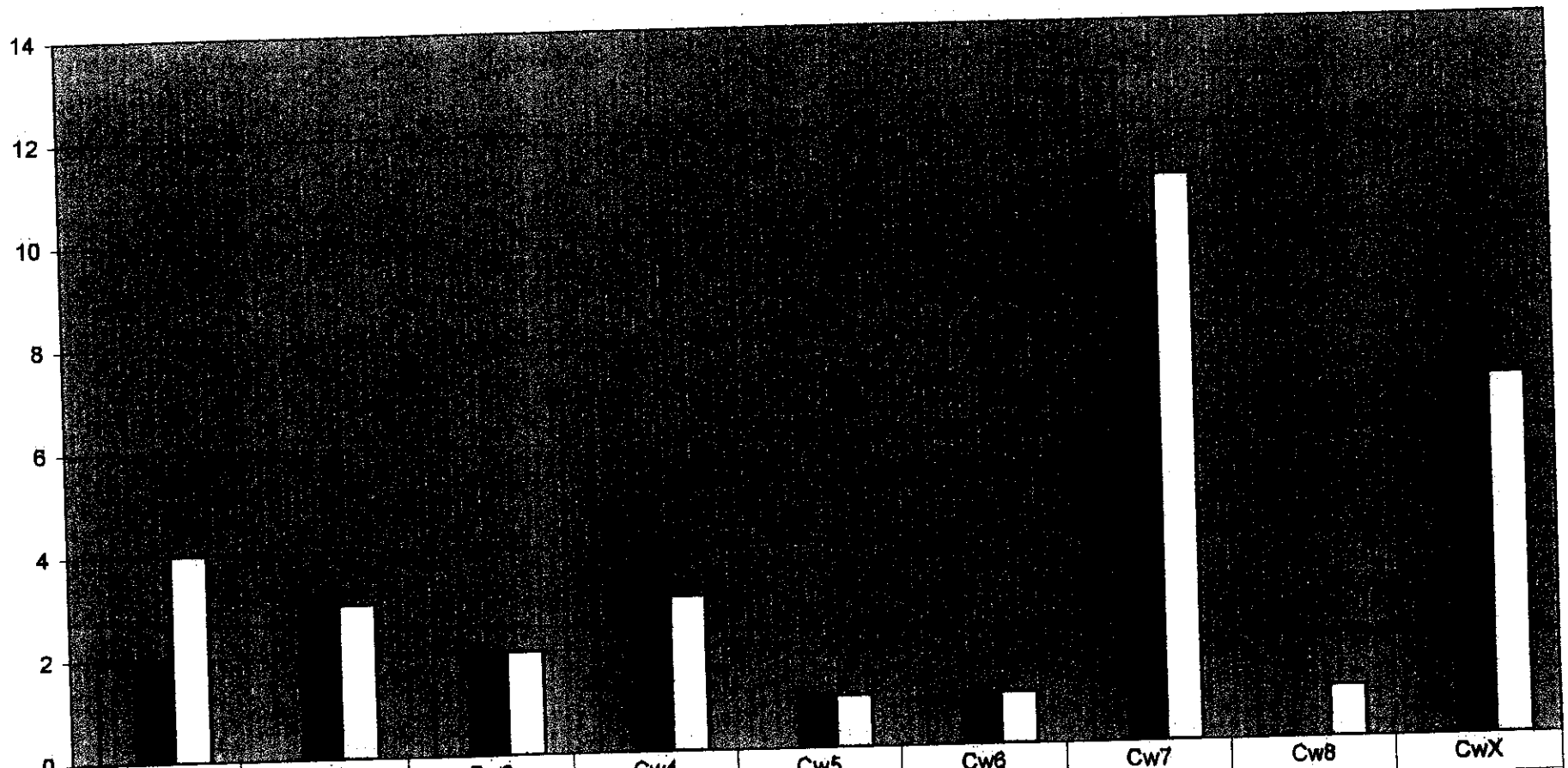
Antigen	Group 1		Group 2		Group 3	
	no.	%	no.	%	no.	%
DQ1	23	76.6	25	83.3	22	73.3
DQ2	6	23.3	10	33.3	13	43.3
DQ3	12	40	7	23.3	8	26.6
DQ4	0	0	2	6.6	1	3.3
DQ6	12	40	13	43.3	13	43.3
DQ7	7	23.3	0	0	0	0
DQ8	1	3.3	1	3.3	0	0

Figure 21: Distribution of HLA- B between the three studied groups



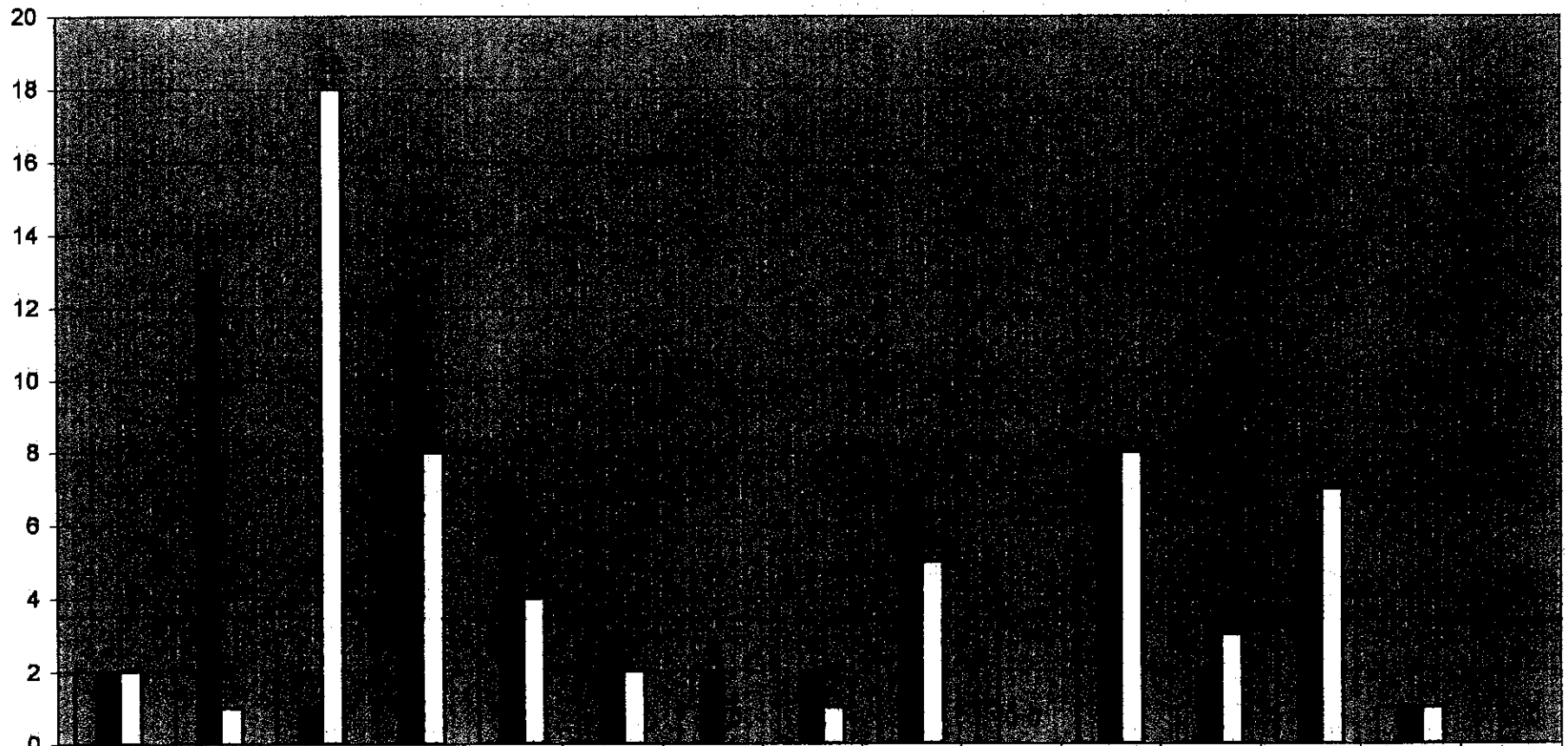
	B7	B8	B13	B14	B15	B18	B35	B37	B38	B39	B41	B42	B44	B45	B49	B50	B51	B52	B53	B55	B57	B62	B63	B65	B70	B73	B76	B77
GROUP 1	3	4	2	0	1	1	7	2	4	1	2	1	1	0	0	2	4	1	3	1	2	0	2	3	1	1	1	0
GROUP 2	1	0	2	1	1	0	3	0	3	1	5	0	2	1	2	2	4	3	0	3	0	3	4	1	0	0	0	0
GROUP 3	2	1	2	3	0	1	4	1	4	1	6	0	2	1	3	2	2	3	1	4	0	2	5	1	0	0	0	1

Figure 22: Distribuation of HLA-C between the three studided groups



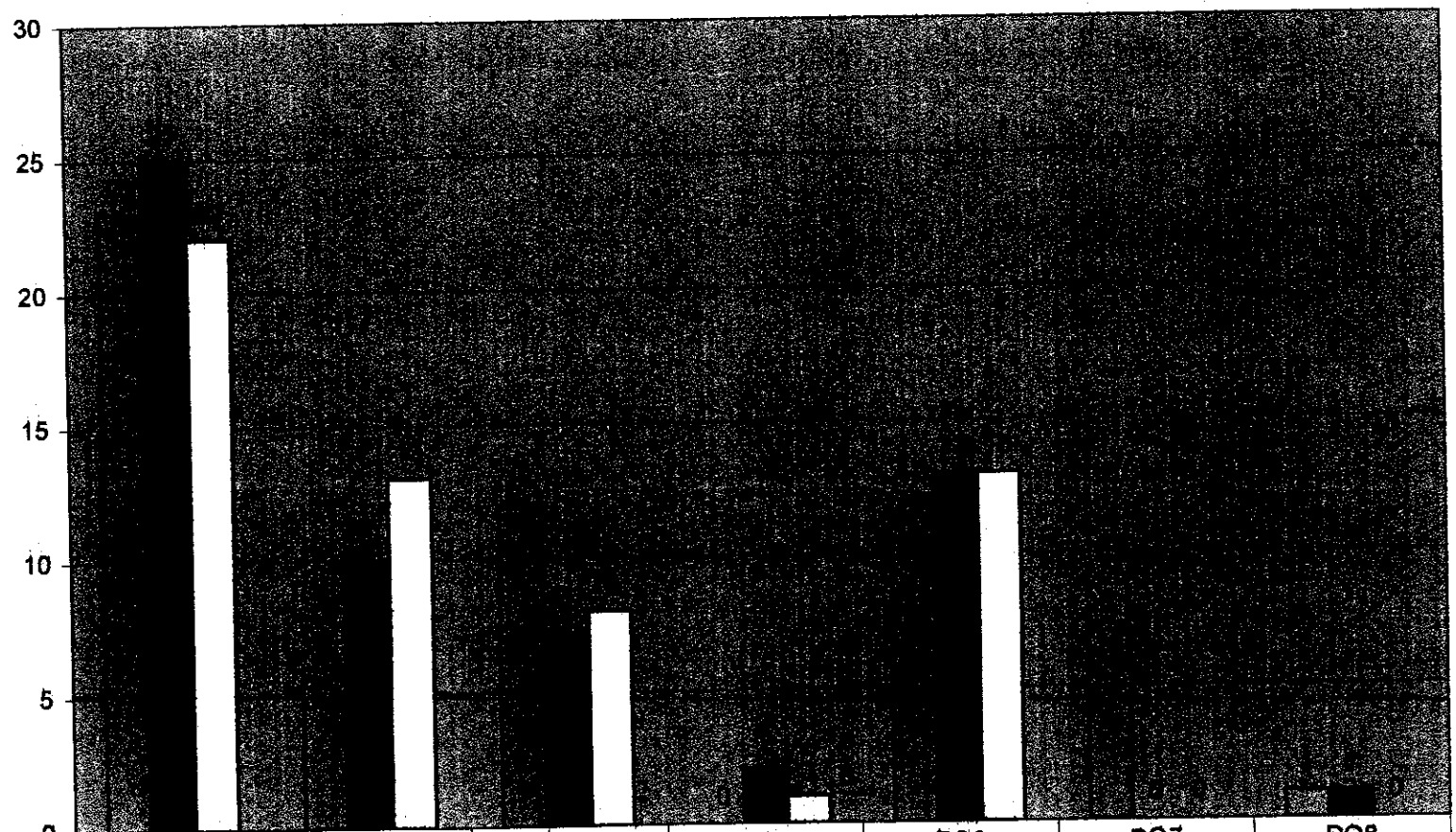
	Cw1	Cw2	Cw3	Cw4	Cw5	Cw6	Cw7	Cw8	CwX
GROUP 1	2	0	2	7	0	4	13	2	6
GROUP2	2	3	2	4	1	1	10	0	8
GROUP3	4	3	2	3	1	1	11	1	7

Figure 23: Distribution of HLA-DR between the three studied groups



	DR1	DR2	DR3	DR4	DR7	DR8	DR9	DR10	DR11	DR12	DR13	DR14	DR15	DR16	DR138
GROUP 1	2	2	3	9	7	4	1	4	3	4	14	1	5	1	1
GROUP2	2	13	1	12	7	3	2	2	7	0	8	2	6	1	0
GROUP3	2	1	18	8	4	2	0	1	5	0	8	3	7	1	0

Figure 24: Distribution of HLA-DQ between the three studied groups



	DQ1	DQ2	DQ3	DQ4	DQ6	DQ7	DQ8
GROUP1	23	6	12	0	12	7	1
GROUP2	25	10	7	2	13	0	1
GROUP3	22	13	8	1	13	0	0

Table XVII: Comparison of liver function tests , platelets, iron and AFP between patients had HLA-A2 and patients had not HLA-A2 in- group 3 (HCV-CAH).

Parameter	Patients had not HLA-A2		Patients had HLA-A2		t	P
	n	X +/- SEM	n	X +/- SEM		
Prothrombin	13	83.15 +/- 8.68	17	87.41 +/- 5.30	- 1.66	0.108
ALT (SGPT)	13	59.46 +/- 39.09	17	55.23 +/- 25.15	0.36	0.722
AST (SGOT)	13	50.84 +/- 29.66	17	39.11 +/- 19.05	1.32	0.199
ALP	13	83.15 +/- 8.68	17	87.41 +/- 5.30	- 1.66	0.108
T. Protein	13	7.11 +/- 0.76	17	7.03 +/- 0.70	- 1.36	0.105
Albumin	13	3.44 +/- 0.737	17	4.04 +/- 0.328	- 2.98	0.106
Bilirubin	13	1.13 +/- 0.44	17	1.19 +/- 0.42	1.02	0.196
Platelets	13	133.23 +/- 49.66	17	173 +/- 73.15	- 1.69	0.103
Iron	13	145.69 +/- 59.81	17	106.15 +/- 28.78	2.40	0.024
AFP	13	7.86 +/- 8.56	17	4.91 +/- 4.63	1.21	0.236

Table XVIII : Comparison of liver function tests, platelets, iron and AFP between patients had HLA-DR3 and patients had not HLA-DR3in- group 3 (HCV-CAH).

Parameter	Patients had not HLADR3		Patients had HLA-DR3		t	P
	n	X +/- SEM	n	X +/- SEM		
Prothrombin	17	86.05 +/- 8.12	13	84.42 +/- 5.93	0.42	0.675
ALT (SGPT)	17	54.70 +/- 32.35	13	60.15 +/- 31.13	- 0.46	0.646
AST (SGOT)	17	43.0 +/- 27.69	13	45.76 +/- 20.50	-0.30	0.765
ALP	17	151.23 +/- 72.5	13	176.84 +/- 57.04	- 1.05	0.304
T. Protein	17	7.34 +/- 0.80	13	7.21 +/- 0.74	- 1.34	0.114
Albumin	17	3.75 +/- 0.725	13	3.81 +/- 0.447	- 0.25	0.807
Bilirubin	17	1.2 +/- 0.44	13	1.23 +/- 0.45	-1.22	0.150
Platelets	17	155.64 +/- 68.59	13	156.0 +/- 65.59	- 0.01	0.989
Iron	17	116.21 +/- 42.15	13	132.53 +/- 55.75	- 0.91	0.368
AFP	17	5.711 +/- 5.04	13	6.83 +/- 8.53	- 0.45	0.657