RESULTS

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This study was performed on 100 male subjects divided into 4 groups. Each group comprised 25 subjects :

Group 1 : Control group.

Group 2 : Patients with type 2 diabetes mellitus.

Group 3 : Patients with chronic hepatitis C virus (CHCV).

Group 4 : Patients with chronic hepatitis C virus and type-2 diabetes mellitus (CHCV with DM).

Data obtained from the control group (group 1) :

1- Clinical data (table 4) :

- The age of this group ranged from 46 to 64 with a mean of 53 ± 1.1 years.
- Body mass index ranged from 20 to 32 with a mean of 25 ± 0.7 kg/m^2.
- History and clinical examination revealed no abnormalities aiming to exclude hepatic diseases, pancreatic diseases, DM or any other disease that may interfere with analysis of data.

2- Laboratory data (table 4) :

* Routine investigations :

- Both HCV-antibody and HBsAg were negative.
- Serum ALT ranged from 4 to 11 with a mean of 8 ± 0.41 u/L.
- Serum AST ranged from 5 to 11 with a mean of 8 ± 0.3 u/L.
- Serum albumin ranged from 3.8 to 4.4 with a mean of 4 ± 0.03g/dL.
- Serum bilirubin ranged from 0.3 to 0.9 with a mean of 0.77 ± 0.03 mg/dL.

- Serum fasting glucose ranged from 82 to 105 with a mean of 93 ± 1.37 mg/dL.
- Serum 2-hours postprandial glucose ranged from 96 to 135 with a mean of 115 ± 2.36 mg/dL.
- Serum creatinine ranged from 0.6 to 1 with a mean of 0.73 ± 0.02 mg/dL.

* Specific investigations (table 5) :

- HCV-RNA was negative.
- Serum insulin ranged from 6 to 16 with a mean of 10 ± 0.6 uiu/mL.
- Serum c-peptide ranged from 0.82 to 0.21 with a mean of 1.3 ± 0.07 ng/mL.
- Serum amylase ranged from 23 to 77 with a mean of 52 ± 2.9 u/L.

3- Abdominal ultrasonography showed no abnormalities aiming to exclude hepatic, pancreatic, biliary or other diseases that may interfere with this study.

There was no significant correlation between serum insulin, c-peptide and amylase and the age of subjects, ALT, AST and FG (table 18).

Data obtained from the diabetic group (group 2) :

1- Clinical data (table 6) :

- The age of this group ranged from 46 to 64 with a mean of 55 ± 1 years which was non significantly different from that of the control group ($t = 0.75$, $P > 0.05$).

- Body mass index ranged from 20 to 32 with a mean 27 ± 0.8 which was non significantly different from that of the control group ($t = 1.7, P > 0.05$).
- History and clinical examination revealed only a positive history of DM. There were no other diseases that may interfere with this study.
- Twenty two out of twenty five diabetic patients (88%) from this group had positive family history of DM (Fig. 14).

2- Laboratory data :

* Routine investigations :

- Both HCV-antibody and HBsAg were negative.
- Serum ALT ranged from 6 to 11 with a mean of 9 ± 0.31 u/L (table 6), which was non significantly different from that of the control group ($t = 1.39, P > 0.05$), (table 14, Fig. 19 and 20).
- Serum AST ranged from 6 to 11 with a mean of 8 ± 0.29 u/L (table 6), which was non significantly different from that of the control group ($t = 0.93, P > 0.05$), (table 14, Fig. 21 and 22).
- Serum albumin ranged from 3.8 to 4.4 with a mean of 3.96 ± 0.04 g/dl (table 6), which was non significantly different from that of the control group ($t = 0.8, P > 0.05$).
- Serum bilirubin ranged from 0.3 to 0.9 with a mean of 0.8 ± 0.03mg/dL (table 6). This was non statistically different from that of the control group ($t = 1.6, P > 0.05$).
- Serum fasting glucose from 96 to 201 with a mean of 160 + 63. Mg/dl (table 6), which was statistically higher than that of the control group ($t = 10.39, P < 0.001$), (table 14, Fig. 23 and 24).
- Serum 2-hours postprandial glucose ranged from 156 to 251 mg/dL with a mean of 204 ± 5.6 mg/dL (table 6), which was

statistically higher than that of the control group ($t = 14.6$, $P < 0.001$), (table 14, Fig. 25 and 26).

- Serum creatinine ranged from 0.6 to 1.1 with a mean of 0.74 ± 0.03 mg/dL which was non significantly different from that of the control group ($t = 0.25$, $P > 0.05$).

* Specific investigations :

- HCV-RNA was negative (table 7).
- Serum insulin ranged from 8 to 21 with a mean of 12 ± 0.7 μiu/ml (table 7), which was statistically higher than that of the control group ($t = 2.17$, $P < 0.05$), (table 15, Fig. 27 and 28).
- Serum C-peptide ranged from 1.13 to 2.66 with a mean of 1.64 $\pm$ 0.08 ng/ml (table 7), which was statistically higher than that of the control group ($t = 3.21$, $P < 0.05$), (table 15, Fig. 29 and 30).
- Serum amylase ranged from 30 to 73 with a mean of 54 ± 2.5 u/L (table 7), which was non statistically different from that of the control group ($t = 0.52$, $P > 0.05$), (table 15, Fig. 31 and 32).

3- Abdominal ultrasonography showed no abnormalities aiming to exclude hepatic, pancreatic, biliary or other diseases that may interfere with this study.

There was no significant correlation between serum insulin, C-peptide and amylase and age of the patient, duration of DM, ALT, AST or FG (table 19).

Data obtained from chronic hepatitis C virus group (group 3) :

1- Clinical data :

- The age of this group ranged from 46 to 64 with a mean of 54 ± 1 (table 8), which was not statistically different from the control group ($t = 0.67$, $P > 0.05$).

- Body mass index ranged from 20 to 32 with a mean of 24 ± 0.7 kg/m^2 (table 8). There was non significant difference between this value and that of the control group ($t = 1$, $P > 0.05$).
- The duration of HCV contamination ranged from 3 to 10 with a mean of 6 ± 0.4 years (table 8).
- History and clinical examination revealed only positive history of HCV infection. There was no other diseases that may interfere with this study.

2- Laboratory data :

* Routine investigations :

- Hepatitis C virus antibody was positive while HBsAg was negative.
- Serum ALT ranged from 105 to 159 with a mean of 138 ± 2.38 uu/L (table 8), which was statistically higher than that of the control group ($t = 53.3$, $P < 0.001$), (table 14, Fig. 19 and 20).
- Serum AST ranged from 88 to 136 with a mean of 110 ± 3.04 u/L (table 8), which was statistically higher than that of the control group ($t = 33.4$, $P < 0.001$), (table 14, Fig. 21 and 22).
- Serum albumin ranged from 3.8 to 4.2 with a mean of 3.94 ± 0.03 g/dL (table 8). There was non significant difference between this result and that of the control group ($t = 1.5$, $P > 0.05$).
- Serum bilirubin ranged from 0.6 to 1.2 with a mean of 0.92 ± 0.5 mg/dL (table 8), which was non statistically different from that of the control group ($t = 0.56$, $P > 0.05$).
- Serum fasting glucose ranged from m86 to 106 with a mean of 95 ± 1.23 (table 8). There was non significant difference between this value and that of the control group ($t = 1.11$, $P > 0.05$), (table 14, Fig. 23 and 24).

- Serum 2-hours postprandial glucose ranged from 100 to 139 with a mean of 121 ± 1.97 (table 8), which was non significantly different from that of the control group ($t = 1.94$, $P > 0.05$), (table 14, Fig. 25 and 26).
- Serum creatinine ranged from 0.6 to 1.1 with a mean of 0.78 ± 0.03 (table 8). This result was non statistically different from that of the control group ($t = 1.25$, $P > 0.05$).

* Specific investigations :

- Hepatitis C virus-RNA was positive (table 9).
- Serum insulin ranged from 6 to 15 with a mean of 9 ± 0.5 μiu/mL (table 9), which was non significantly different from that of the control group ($t = 1.28$, $P > 0.05$), (table 15, Fig. 27 and 28).
- Serum C-peptide ranged from 0.66 to 2 with a mean of 1.22 ± 0.06 (table 9), which was non significantly different from that of the control group ($t = 0.9$, $P > 0.05$), (table 15, Fig. 29 and 30).
- Serum amylase ranged from 40 to 120 with a mean of 76 ± 4.1 (table 9), which was statistically higher than that of the control group ($t = 4.79$, $P < 0.001$), (table 15, Fig. 31 and 32).

3- Abdominal ultrasonography showed no abnormalities aiming to exclude heaptic, pancreatic, biliary or other diseases that may interfere with this study.

4- Liver biopsy showed features of chronic persistent hepatitis with characteristic bile duct damage, portal lymphoid aggregates and steatosis.

There was no significant correlation between serum insulin, C-peptide and amylase and age of the patient, duration of HCV contamination, ALT, AST or F.G. (table 20).

Data obtained from chronic hepatitis C virus group with diabetes mellitus (group 4) :

1- Clinical data :

- The age of this group ranged from 46 to 64 with a mean of 56 ± 1.4 years (table 10), which was non statistically different from that of the control ($t = 1.68$, $P > 0.05$), the diabetic ($t = 0.58$, $P > 0.05$) or that of CHCV group ($t = 0.57$, $P > 0.05$).
- Body mass index ranged from 20 to 32 with a mean of 26 ± 0.8 kg/m^2 (table 10), which was non statistically different from that of the control ($t = 0.9$, $P > 0.05$), the diabetic ($t = 0.88$, $P > 0.05$) or that of CHCV group ($t = 1.89$, $P > 0.05$).
- The duration of DM ranged from 6 to 25 with a mean of 13 ± 1.3 years (table 10), which was non statistically different from that of the diabetic group ($t = 1.3$, $P > 0.05$), (table 16).
- The duration of HCV contamination ranged from 5 to 15 with a mean of 9 ± 0.65 years (table 10), which was statistically higher than that of CHCV group ($t = 3.95$, $P < 0.001$), (table 17, Fig. 17 and 18).
- Fifteen out of twenty five CHCV patients with DM (60%) had liver disease diagnosed before DM, while eight patients (32%) had DM diagnosed before liver disease. In the rest (8%), both diseases are diagnosed simultaneously (Fig. 15).
- Twenty three out of twenty five patients (92%) in this group had negative family history of DM (Fig. 16).

- History and clinical examination revealed positive history of HCV infection and DM. There were no other diseases that may intefere with this study.

2- Laboratory data :

* Routine investigations :

- Hepatitis C virus antibody was positive whereas HBsAg was negative (table 10).
- Serum ALT ranged from 123 to 180 with a mean of 148 $\pm$ 2.92 u/L (table 10), which was statistically higher than that of the control ($t = 46.7$, $P < 0.001$), (table 14),the diabetic ($t = 47.4$, $P < 0.001$), (Table 16) and that of CHCV group ($t = 2.56$, $P < 0.05$) (table 17), (Fig. 19 and 20).
- Serum AST ranged from 86 to 143 with a mean of 112 $\pm$ 2.67 u/L (table 10), which was statistically higher than that of control ($t = 38.7$, P 0.001) (table 14) and the diabetic group ($t = 38.5$, $P < 0.001$) (table 16). This value was non significantly different from that of the CHCV group ($t = 0.49$, $P > 0.05$) (table 17), (Fig. 21 and 22).
- Serum albumin ranged from 3.8 to 4.2 with a mean of 3.92 $\pm$ 0.03 g/dL (table 10), which was non statistically different from that of the control ($t = 2$, $P > 0.05$), the diabetic ($t = 0.8$, $P > 0.05$) and CHCV group ($t = 0.5$, $P > 0.05$).
- Serum bilirubin ranged from 0.5 to 1.2 with a mean of 0.87 mg/dL (table 10), which was non statistically different from that of the control ($t = 2$, $P < 0.05$), the diabetic ($t = 1.4$, $P < 0.05$) and CHCV group ($t = 0.8$, $P < 0.05$).
- Serum fasting glucose ranged from 160 to 230 with a mean of 188 $\pm$ 4.3 mg/dL (table 10), which was statistically higher than that of the control ($t = 21.11$, $P < 0.001$), (table 14), the diabetic

(t = 3.67, P < 0.001), (table 16) and CHCV group (t = 20.8, P < 0.001), (Table 17), (Fig. 23 and 24).

- Serum 2-hours postprandial glucose ranged from 197 to 285 with a mean of 239 + 5.9 (table 10), which was statistically higher than that of the control (t = 19.4, P < 0.001), (table 14), the diabetic (t = 4.31, P < 0.001), (table 16) and CHCV group (t = 19, P < 0.001), (table 17), (Fig. 25 and 26).
- Serum creatinine ranged from 0.6 to 1 with a mean of 0.72 ± 0.03 mg/dL (table 10), which was non statistically different from that of the control (t = 0.25, P > 0.05), the diabetic (t = 0.5, P > 0.05) and CHCV group (t = 1.5, P > 0.05).

* Specific investigations :

- Hepatitis C virus-RNA was positive (table 11).
- Serum insulin ranged from 3 to 13 with a mean of 7 ± 0.6μiu/ml (table 11), which was statistically lower than that of the control (t = 2.52, P < 0.05), (table 15), the diabetic (t = 5.4, P < 0.01), (table 16) and CHCV group (t = 2.56, P < 0.05), (table 17), (Fig. 27 and 28).
- Serum C-peptide ranged from 0.58 to 1.96 with a mean of 1.4 + 0.06 ng/ml (table 11), which was statistically lower than that of the control (t = 2.33, P < 0.05), (table 15), the diabetic (t = 6, P < 0.001), (table 16) and CHCV group (t = 2.25, P < 0.05), (table 17), (Fig. 29 and 30).
- Serum amylase ranged from 28 to 111 with a mean of 78 ± 4.8 u/L (table 11), which was statistically higher than that of the control (t = 4.64, P < 0.001), (table 15) and the diabetic group (t = 4.4, P < 0.001) (table 16). On the other hand, this result was non significantly different from that of CHCV group (t = 0.3, P > 0.05), (table 17), (Fig. 31 and 32).

3- Abdominal ultrasonography showed no abnormalities aiming to exclude hepatic, pancreatic, biliary or other diseases that may interfere with this analysis.

4- Liver biopsy showed features of chronic persistent hepatitis with characteristic bile duct damage, portal lymphoid aggregates and steatosis.

There was no significant correlation between serum insulin, C-peptide and amylase and age of the patient, duration of HCV contamination, duration of DM, ALT, AST or FG (table 21).

Table (4): Clinical data and routine investigations of the control group.

S.N.	Age (years)	BMI (kg/m^2)	Anti-HCV antibodies	HBsAg	Serum ALT (u/L)	Serum AST (u/L)	Serum albumin (g/dl)	Serum bilirubin (mg/dl)	Serum F.G (mg/dl)	Serum 2-HPG (mg/dl)	Serum creatinine (mg/dl)
1	52	23	-	-	7	6	4.1	0.9	102	116	0.8
2	54	25	-	-	6	5	4	0.7	90	104	0.7
3	50	30	-	-	11	8	3.8	0.8	85	96	0.6
4	47	20	-	-	6	10	4.3	0.9	91	100	0.6
5	48	22	-	-	10	7	3.8	0.9	84	122	0.9
6	61	31	-	-	7	9	3.8	0.7	98	114	1
7	60	24	-	-	9	6	4.2	0.8	104	125	0.7
8	56	23	-	-	10	11	3.9	0.8	87	109	0.6
9	49	28	-	-	6	7	3.8	0.6	92	117	0.8
10	46	24	-	-	4	9	3.8	0.9	83	94	0.6
11	50	29	-	-	9	9	4.1	0.8	96	130	0.8
12	47	30	-	-	8	7	3.8	0.7	88	110	0.9
13	64	25	-	-	7	6	4.1	0.9	94	98	0.7
14	62	26	-	-	8	7	4.1	0.8	101	134	0.7
15	49	28	-	-	10	7	3.9	0.9	96	115	0.6
16	51	20	-	-	5	9	4.3	0.7	89	108	0.6
17	57	23	-	-	9	10	4	0.8	86	111	0.6
18	54	22	-	-	4	6	4	0.7	91	119	0.7
19	60	27	-	-	6	9	3.8	0.8	100	131	0.9
20	52	26	-	-	10	8	4.2	0.9	93	121	0.8
21	59	32	-	-	11	8	4.1	0.6	82	105	0.8
22	52	20	-	-	8	7	4.2	0.6	102	123	0.6
23	46	25	-	-	7	6	4	0.3	94	128	1
24	48	22	-	-	10	10	4.1	0.9	87	118	0.6
25	51	24	-	-	7	9	4	0.9	105	135	0.7
Range	46 - 64	20 - 32			4 - 11	5 - 11	3.8 - 4.4	0.3 - 0.9	82 - 105	96 - 135	0.6 - 1
Mean ± S.E	53 + 1.1	25 + 0.7			8 + 0.41	8 + 0.3	4 + 0.03	0.77 + 0.03	93 + 1.37	115 + 2.36	0.73+ 0.02

N.B. : S.N = Serial number F.G= Fasting glucose 2HPG = 2 hours postprandial glucose

Table (5): **HCV-RNA, serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/l) values of the control group.**

S.N.	HCV-RNA	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
1	-	6	0.82	49
2	-	14	1.75	54
3	-	10	1.35	52
4	-	9	0.94	38
5	-	13	1.58	62
6	-	11	1.4	46
7	-	9	1.07	71
8	-	6	0.83	27
9	-	14	1.74	64
10	-	16	2.1	58
11	-	13	1.62	23
12	-	15	1.96	60
13	-	8	0.97	50
14	-	7	0.89	44
15	-	10	1.26	48
16	-	13	1.39	52
17	-	11	1.44	61
18	-	10	1.37	77
19	-	12	1.43	47
20	-	7	0.9	55
21	-	8	0.98	66
22	-	11	1.39	33
23	-	6	0.94	75
24	-	10	1.31	60
25	-	9	1	28
Range		6-16	0.82-2.1	23 - 77
Mean ±S.E		10 ± 0.6	1.3 ± 0.07	52 ± 2.9

N.B. : S.N (Serial number).

Table (6): Clinical data and routine investigations of diabetes mellitus group.

S.N.	Age (years)	Duration of D.M (years)	Family history of D.M	BMI (Kg/m^2)	Anti-HCV antibodies	HBsAg	Serum ALT (u/L)	Serum AST (u/L)	Serum albumin (g/dl)	Serum bilirubin (mg/dl)	Serum F.G. (mg/dl)	Serum 2HP G (mg/dl)	Serum creatinine (mg/dl)
1	58	13	+	24	-	-	9	6	3.9	0.8	180	220	0.6
2	61	20	+	30	-	-	11	9	3.8	0.3	170	196	0.6
3	64	21	+	26	-	-	6	8	4.3	0.7	184	213	0.7
4	51	10	-	32	-	-	10	7	3.8	0.9	196	240	0.5
5	49	9	+	29	-	-	8	10	4.2	0.6	100	149	1.1
6	52	12	-	21	-	-	7	9	3.8	0.9	195	251	0.8
7	60	13	+	29	-	-	9	8	3.8	0.9	164	200	0.7
8	51	8	+	31	-	-	8	9	3.9	0.9	177	197	0.6
9	54	14	+	22	-	-	7	6	3.8	0.7	152	178	0.8
10	60	16	+	30	-	-	10	9	4.2	0.7	173	221	0.8
11	61	17	+	31	-	-	10	8	3.9	0.9	186	217	0.6
12	51	10	+	30	-	-	9	7	4	0.8	201	239	0.9
13	56	9	+	24	-	-	11	9	3.8	0.8	127	163	0.8
14	46	6	+	20	-	-	8	11	3.8	0.9	110	190	1.1
15	48	6	-	23	-	-	9	8	4.2	0.9	158	205	0.9
16	57	10	+	30	-	-	10	9	3.9	0.8	190	211	0.8
17	53	8	+	32	-	-	7	5	3.9	0.6	116	156	0.6
18	60	11	+	22	-	-	11	8	4.3	0.9	162	194	0.6
19	53	9	+	30	-	-	7	7	3.9	0.8	185	244	0.7
20	54	11	+	27	-	-	8	9	4	0.7	178	220	0.8
21	63	10	+	28	-	-	11	10	3.9	0.8	153	185	0.6
22	62	7	+	24	-	-	9	7	3.8	0.9	166	241	0.6
23	52	10	+	22	-	-	10	8	4.4	0.9	96	210	0.8
24	49	6	-	30	-	-	7	6	3.8	0.9	164	193	0.6
25	58	12	+	20	-	-	9	7	4	0.9	117	167	1
Range	46- 64	6 - 21		20 - 32			6 - 11	6 - 11	3.8 - 4.4	0.3-0.9	96 - 201	156 - 251	0.6 - 1.1
Mean ± S.E.	55 ± 1	11 ± 0.8		27 ± 0.8			9 ± 0.31	8 ± 0.29	3.96±0.04	0.8 ± 0.03	160 ± 6.3	204 ± 5.6	0.74± 0.03

N.B.: S.N= Serial Number F.G= Fasting glucose 2HPG = 2 hours postprandial glucose

Table (7): **HCV-RNA, serum insulin (μiu/ml) C-peptide (ng/ml) and amylase (u/L) values of diabetes mellitus group.**

S.N.	HCV-RNA	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
1	-	11	1.76	40
2	-	8	1.13	68
3	-	14	1.72	70
4	-	13	1.58	57
5	-	9	1.63	38
6	-	17	1.82	63
7	-	11	1.81	50
8	-	15	2.23	45
9	-	19	2.02	67
10	-	13	1.86	71
11	-	16	1.55	42
12	-	12	2.66	58
13	-	13	1.49	34
14	-	21	1.9	60
15	-	12	1.34	49
16	-	8	1.71	64
17	-	9	1.13	51
18	-	8	2.12	41
19	-	12	1.18	62
20	-	13	1.27	46
21	-	14	1.53	30
22	-	11	1.76	48
23	-	8	1.39	61
24	-	12	1.23	73
25	-	9	1.47	57
Range		8 - 21	1.13- 2.66	30 - 73
Mean ±S.E		12 ± 0.7	1.64 ± 0.08	54 ± 2.5

N.B.: S.N (Serial number).

Table (8): Clinical data and routine investigations of chronic hepatitis C virus group.

S.N.	Age (years)	Duration of HCV cont. (years)	BMI (Kg/m^2)	Anti-HCV antibodies	HBsAg	Serum ALT (u/L)	Serum AST (u/L)	Serum albumin (g/dl)	Serum bilirubin (mg/dl)	Serum F.G. (mg/dl)	2HPG (mg/dl)	Serum creatinine (mg/dl)
1	62	7	28	+	-	138	114	4	0.8	91	120	0.6
2	58	9	24	+	-	154	97	3.8	1.1	88	110	0.8
3	56	5	22	+	-	140	102	3.9	1	103	133	0.6
4	60	7	22	+	-	150	132	4.1	0.9	96	108	1
5	64	5	20	+	-	148	96	3.8	0.9	100	136	0.9
6	56	6	32	+	-	128	114	3.9	0.6	86	120	0.6
7	58	8	25	+	-	138	88	4.2	0.8	90	115	0.6
8	49	5	22	+	-	140	108	3.8	0.6	100	138	0.6
9	50	9	30	+	-	144	124	3.9	0.9	88	107	1
10	61	3	23	+	-	112	103	3.8	1.2	96	117	0.7
11	57	4	26	+	-	138	110	4.2	1.2	100	129	0.8
12	58	9	27	+	-	126	93	3.9	1	99	125	0.7
13	48	4	26	+	-	150	135	3.8	0.6	90	116	0.8
14	47	4	22	+	-	143	122	3.9	1.1	100	130	0.8
15	50	7	24	+	-	136	100	4.2	1.2	93	121	0.8
16	52	3	29	+	-	146	90	3.8	1	106	139	0.6
17	47	6	21	+	-	128	92	3.9	0.4	102	124	1
18	46	5	24	+	-	136	119	3.9	1.1	86	118	0.9
19	54	8	30	+	-	105	130	4	0.9	94	123	1.1
20	46	5	22	+	-	140	109	3.8	1.2	95	115	1
21	52	6	20	+	-	133	96	4.2	1	100	125	0.6
22	54	10	25	+	-	136	101	3.8	0.5	90	117	0.7
23	54	4	24	+	-	142	112	3.8	0.7	103	125	1
24	49	5	20	+	-	159	133	3.9	1.1	90	113	0.6
25	52	8	23	+	-	142	136	4.2	1.2	86	100	0.7
Range	46 - 64	3-10	20 - 32			105-159	88-136	3.8-4.2	0.6-1.2	86-106	100-139	0.6-1.1
Mean ±S.E	54 ± 1	6 ± 0.4	24± 0.7			138±2.38	110±3.04	3.94±0.03	0.92±0.5	95±1.23	121±1.97	0.78±0.03

N.B.: S.N= Serial Number F.G= Fasting glucose Cont. = Contamination 2HPG = 2 hours postprandial glucose

Table (9): **HCV-RNA, serum insulin (μiu), C-peptide (ng/ml) and amylase (u/l) values of the chronic hepatitis C group.**

S.N.	HCV-RNA	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
1	+	10	1.26	92
2	+	10	1.21	120
3	+	8	1.08	69
4	+	7	0.66	79
5	+	9	1.08	48
6	+	11	1.32	91
7	+	8	2	53
8	+	13	1.2	71
9	+	6	0.85	84
10	+	9	1.26	40
11	+	7	1.5	98
12	+	10	1.15	73
13	+	6	0.84	90
14	+	12	1.21	53
15	+	8	1.13	77
16	+	6	0.87	45
17	+	11	1.26	100
18	+	6	0.89	69
19	+	14	1.42	67
20	+	15	1.8	49
21	+	6	1.5	71
22	+	11	1.23	103
23	+	10	1.16	84
24	+	9	1.2	81
25	+	8	1.37	96
Range		6 - 15	0.66 - 2	40 - 120
Mean ±S.E		9 ± 0.5	1.22 ± 0.06	76 ± 4.1

N.B. : S.N (Serial number).

Table (10): Clinical data and routine investigations of chronic hepatitis C virus patients with diabetes mellitus.

S.N.	Age (years)	Duration of DM (years)	Duration of HCV cont. (years)	Family history of DM	Anti-HCV antibodies	HBsAg	BMI (kg/m^2)	Serum ALT (U/L)	Serum AST (u/L)	Serum albumin (mg/dl)	Serum bilirubin (mg/dl)	Serum F.G (mg/dl)	2HPG (mg/dl)	Serum creatinine (mg/dl)
1	63	20	11	-	+	-	24	148	99	3.8	1.2	140	210	0.7
2	54	24	5	-	+	-	29	123	86	3.9	0.5	171	240	0.7
3	59	14	14	-	+	-	22	166	111	4.1	0.9	213	270	0.9
4	52	7	9	-	+	-	20	162	116	3.8	0.9	196	253	0.8
5	50	6	7	-	+	-	28	180	127	3.8	1.1	190	226	0.8
6	64	23	5	+	+	-	21	157	116	4.1	1	213	284	0.6
7	49	7	8	-	+	-	26	159	120	3.9	0.6	190	269	0.6
8	62	8	10	-	+	-	24	160	143	3.8	0.7	191	234	1
9	63	15	15	-	+	-	30	136	100	4	1	178	227	0.7
10	62	20	5	-	+	-	23	166	102	3.8	1.1	163	231	0.6
11	64	11	12	-	+	-	32	126	132	3.9	0.6	187	218	0.6
12	63	22	4	-	+	-	27	123	113	4.2	0.8	200	266	0.8
13	60	12	15	-	+	-	29	158	96	3.8	1	168	197	0.7
14	47	9	11	-	+	-	26	148	111	4	0.9	230	285	0.7
15	49	7	9	-	+	-	28	151	121	3.8	1.1	195	241	0.6
16	50	9	10	-	+	-	31	128	117	3.9	0.9	210	272	0.8
17	54	10	12	+	+	-	20	134	108	4.2	0.8	160	200	0.6
18	62	17	5	-	+	-	22	144	106	3.8	0.6	190	229	0.6
19	64	24	6	-	+	-	30	140	96	3.8	0.8	178	244	0.6
20	64	25	7	-	+	-	21	147	100	4.2	0.7	207	251	0.6
21	52	9	10	-	+	-	25	156	97	3.9	1.2	188	218	0.7
22	48	6	9	-	+	-	24	148	121	3.8	0.6	168	205	0.8
23	48	7	8	-	+	-	20	147	116	3.9	0.9	180	230	1
24	46	6	8	-	+	-	30	160	118	4	0.8	222	267	0.9
25	50	10	13	-	+	-	32	141	130	3.9	0.9	160	198	0.6
Range Mean ±S.E	46-64 56±1.4	6-25 13±1.3	5- 15 9±0.65				20-32 26±0.8	123-180 148±2.92	86-143 112±2.67	3.8-4.2 3.92±0.03	0.5-1.2 0.87±0.04	160-230 188±4.3	197-285 239±5.9	0.6-1 0.72±0.03

N.B.: S.N= Serial Number Cont. = Contamination F.G= Fasting glucose 2HPG = 2 hours postprandial glucose

Table (11): **HCV-RNA, serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/l) values of the group of chronic hepatitis C with diabetes mellitus.**

S.N.	HCV-RNA	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
1	+	6	0.74	79
2	+	9	1.04	95
3	+	8	0.99	74
4	+	7	0.88	59
5	+	3	0.65	97
6	+	6	0.87	53
7	+	9	1.12	40
8	+	4	0.7	99
9	+	7	1.02	84
10	+	12	1.22	93
11	+	5	1.07	111
12	+	8	1.09	82
13	+	5	1.01	100
14	+	4	0.74	41
15	+	3	0.68	106
16	+	9	1.32	98
17	+	13	1.53	89
18	+	10	1.3	49
19	+	8	1.16	107
20	+	12	1.03	87
21	+	7	1.23	77
22	+	5	1.06	49
23	+	11	1.96	96
24	+	4	0.57	28
25	+	3	1.02	61
Range		3 - 13	0.58 - 1.96	28 - 111
Mean ±S.E		7 ± 0.6	1.04 ± 0.06	78 ± 4.8

N.B. : S.N (Serial number).

Table (12): **Mean ± S.E of serum ALT (u/L), AST (u/l), FG (mg/dl) and 2-HPG (mg/dl) in the study and control groups.**

	Control group (n = 25)	DM group (n = 25)	CHCV group (n = 25)	CHCV with DM group (n = 25)
Serum ALT (u/L)	8 ± 0.54	9 ± 0.31	138 ± 2.38	148 ± 2.92
Serum AST (u/L)	8 ± 0.3	8 ± 0.29	110 ± 3.04	112 ± 2.67
Serum FBG (mg/dl)	93 ± 1.37	160 ± 6.3	95 ± 1.23	188 ± 4.3
Serum 2-HPG (mg/dl)	115 ± 2.36	204 ± 5.6	121 ± 1.97	239 ± 5.9

Table (13): **Mean ± S.E of serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) in the study and control groups.**

	Control group (n = 25)	DM group (n = 25)	CHCV group (n = 25)	CHCV with DM group (n = 25)
Serum insulin (μiu/ml)	10 ± 0.6	12 ± 0.7	9 ± 0.5	7 ± 0.6
Serum C-peptide (ng/ml)	1.3 ± 0.07	1.64 ± 0.08	1.22 ± 0.06	1.04 ± 0.06
Serum amylase (u/l)	52 ± 2.9	54 ± 2.5	76 ± 4.1	78 ± 4.8

N.B.:

n = Number of cases.
FG = Fasting blood glucose.
2-HPG = 2-hours post prandial glucose.

Table (14): **Statistical comparison of serum ALT (u/L), AST (u/L), FG (mg/dl) and 2-HPG (mg/dl) between the study and control groups.**

	Control group (n = 25)	DM group (n = 25)	CHCV group (n = 25)	CHCV with DM group (n = 25)
Serum ALT (u/L)	8 ± 0.41	9 ± 0.31 t = 1.39 P > 0.05 (N.S)	138 ± 2.38 t = 53.3 P < 0.001 (H.S)	148 ± 2.92 t = 46.7 P < 0.001 (H.S)
Serum AST (u/L)	8 ± 0.3	8 ± 0.29 t = 0.93 P > 0.05 (N.S)	110 ± 3.04 t = 33.4 P < 0.001 (H.S)	112 ± 2.67 t = 38.7 P < 0.001 (H.S)
Serum FG (mg/dl)	93 ± 1.37	160 ± 6.3 t = 10.39 P < 0.001 (H.S)	95 ± 1.23 t = 1.11 P > 0.05 (N.S)	188 ± 4.3 t = 21.11 P < 0.001 (H.S)
Serum 2-HPG (mg/dl)	115±2.36	204 ± 5.6 t = 14.6 P < 0.001 (H.S)	121 ± 1.97 t = 1.94 P > 0.05 (N.S)	239 ± 5.9 t = 19.4 P < 0.001 (H.S)

N.B.:

n = Number of cases.

N.S = Non significant "t" < 2.02 "P" > 0.05.

H.S = Highly significant "t" > 3.55 "P" < 0.001.

FG = Fasting blood glucose.

2HPG = 2-hours postprandial glucose.

Table (15): **Statistical comparison of serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) between the study and control groups.**

	Control group (n = 25)	DM group (n = 25)	CHCV group (n = 25)	CHCV with DM group (n = 25)
Serum insulin (μiu/ml)	10 ± 0.6	12 ± 0.7 t = 2.17 P < 0.05 (S)	9 ± 0.5 t = 1.28 P > 0.05 (N.S.)	7 ± 0.6 t = 2.52 P < 0.05 (S)
Serum C-peptide (ng/ml)	1.3 ± 0.07	1.64 ± 0.08 t = 3.21 P < 0.05 (S)	1.22 ± 0.06 t = 0.9 P > 0.05 (N.S)	1.04 ± 0.06 t = 2.83 P < 0.05 (S)
Serum amylase (u/l)	52 ± 2.9	54 ± 2.5 t = 0.52 P > 0.05 (N.S)	76 ± 4.1 t = 4.79 P < 0.001 (H.S)	78 ± 4.8 t = 4.64 P < 0.001 (H.S)

N.B.:

n = Number of cases.

N.S = Non significant "t" < 2.02 "P" > 0.05.

S = Significant "t" > 2.02 "P" < 0.05.

H.S = Highly significant "t" > 3.55 "P" < 0.001.

Table (16): **Statistical comparison of duration of DM (years), ALT (u/L), AST (u/L), FG (mg/dl), 2-HPG (mg/dl), serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) between CHCV group with DM and DM group.**

	DM group (n = 25)	CHCV with DM group (n = 25)		DM group (n = 25)	CHCV with DM group (n = 25)
Duration of DM (years)	11 ± 0.8	3 + 1.3 t = 1.31 P > 0.05 (N.S)	2-HPG (mg/dl)	204 ± 5.6	239 ± 5.9 t = 4.31 P < 0.001 (H.S)
ALT (u/L)	9 ± 0.31	148 ± 2.92 t = 47.4 P < 0.001 (H.S.)	S. insulin (μiu/ml)	12 ± 0.7	7 ± 0.6 t = 5.4 P < 0.001 (H.S)
AST (u/L)	8 ± 0.29	112 2.67 t = 38.5 P < 0.001 (H.S)	S. C-peptide (ng/ml)	1.64 ± 0.08	1.04 ± 0.06 t = 6 P < 0.001 (H.S)
FG (mg/dl)	160 ± 6.3	183 ± 4.3 t = 3.67 P < 0.001 (H.S)	S. amylase (u/L)	54 ± 2.5	78 ± 4.8 t = 4.4 P < 0.001 (H.S)

N.B.:

n = Number of cases.

H.S = Highly significant "t" > 3.55 P < 0.001.

FG = Fasting blood glucose.

2-HPG = 2-hours postprandial glucose.

Table (17): **Statistical comparison of duration of HCV contamination (years), ALT (u/L), AST (u/L), FG (mg/dl), 2-HPG (mg/dl), serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) between CHCV group with DM and CHCV group.**

	CHCV group (n = 25)	CHCV with DM group (n = 25)		CHCV group (n = 25)	CHCV with DM group (n = 25)
Duration of HCV contamination (years)	6 ± 0.4	9 ± 0.65 t = 3.95 P < 0.001 (H.S)	2-HPG (mg/dL)	121 ± 1.97	239 ± 5.9 t = 19 P < 0.001 (H.S)
ALT (u/L)	138 ± 2.38	148 ± 2.92 t = 2.65 P < 0.05 (S)	Serum insulin (μiu/ml)	9 ± 0.5	7 ± 0.6 t = 2.56 P < 0.05 (S)
AST (u/L)	110 ± 3.04	112 ± 2.67 t = 0.49 P > 0.05 (N.S)	Serum C-peptide (ng/ml)	1.22 ± 0.06	1.04 ± 0.06 t = 2.25 P < 0.05 (S)
FG (mg/dl)	95 ± 1.23	188 ± 4.3 t = 20.8 P < 0.001 (H.S)	Serum amylase (u/L)	76 ± 4.1	78 ± 4.8 t = 0.3 P > 0.05 (N.S)

N.B.:

n = Number of cases.

N.S = Non-significant "t" < 2.02 P > 0.05.

S = Significant "t" > 2.02, P < 0.05.

H.S = Highly significant "t" > 3.55, P < 0.001.

FG = Fasting blood glucose.

2HPG = 2-hours postprandial glucose.

Table (18): **Correlation between serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) and age of the subjects, ALT (u/L), AST (u/L), FG (mg/dl) in the control group.**

	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
	r	r	r
Age of the subjects (years)	0.001 (N.S)	0.032 (N.S)	0.041 (N.S)
ALT (u/L)	-0.06 (N.S)	0.035 (N.S)	0.004 (N.S)
AST (u/L)	-0.33 (N.S)	0.02 (N.S)	0.023 (N.S)
FG (mg/dl)	-0.095 (N.S)	0.059 (N.S)	0.064 (N.S)

N.B.:

r = Correlation coefficient.

N.S = Non-significant $r < 0.4$, $P > 0.05$.

FG = Fasting blood glucose.

Table (19): **Correlation between serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) and age of the patients, duration of DM, ALT (u/L), AST (u/L) and FG (mg/dl), in diabetic group.**

	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
	r	r	r
Age (years)	0.049 (N.S)	0.005 (N.S)	0.011 (N.S)
Duration of DM (years)	0.052 (N.S)	0.006 (N.S)	0.036 (N.S)
ALT (u/L)	- 0.055 (N.S)	- 0.006 (N.S)	-0.012 (N.S)
AST (u/L)	0.057 (N.S)	0.006 (N.S)	0.012 (N.S)
FG (mg/dl)	0.004 (N.S)	0.005 (N.S)	0.009 (N.S)

N.B.:

r = Correlation coefficient.

N.S = Non-significant $r < 0.4$, $P > 0.05$.

FG = Fasting blood glucose

Table (20): **Correlation between serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) and age of the patients (years), duration of HCV contamination (years), ALT (u/L), AST (u/L) and FG (mg/dl) in CHCV group.**

	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
	r	r	r
Age of the subject (years)	0.13 (N.S)	0.007 (N.S)	0.013 (N.S)
Duration of HCV contamination (years)	0.08 (N.S)	0.004 (N.S)	0.008 (N.S)
ALT (u/L)	0.013 (N.S)	0.001 (N.S)	0.001 (N.S)
AST (u/L)	0.026 (N.S)	0.002 (N.S)	0.003 (N.S)
FG (mg/dl)	-00.04 (N.S)	- 0.002 (N.S)	-0.004 (N.S)

N.B.:

r = Correlation coefficient.

N.S = Non-significant $r < 0.4$, $P > 0.05$.

FG = Fasting blood glucose.

Table (21): **Correlation between serum insulin (μiu/ml), C-peptide (ng/ml) and amylase (u/L) and age of the patients (years), duration of HCV contamination (years), duration of DM (years), ALT (u/L), AST (u/L) and FG (mg/dL) in CHCV group with DM.**

	Serum insulin (μiu/ml)	Serum C-peptide (ng/ml)	Serum amylase (u/L)
	r	r	r
Age of the subject (years)	0.013 (N.S)	0.001 (N.S)	0.002 (N.S)
Duration of HCV (years)	0.039 (N.S)	0.002 (N.S)	0.001 (N.S)
Duration of DM (years)	0.013 (N.S)	0.001 (N.S)	0.002 (N.S)
ALT (u/L)	0.023 (N.S)	0.001 (N.S)	0.003 (N.S)
AST (u/L)	0.008 (N.S)	0.0004 (N.S)	0.001 (N.S)
FG (mg/dl)	-0.016 (N.S)	-0.001 (N.S)	-0.004 (N.S)

N.B.:

r = Correlation coefficient.

N.S = Non-significant $r < 0.4$, $P > 0.05$.

FG = Fasting blood glucose.

Fig. (14): Distribution of diabetic group according to positivity of family history (F.H) of D.M.

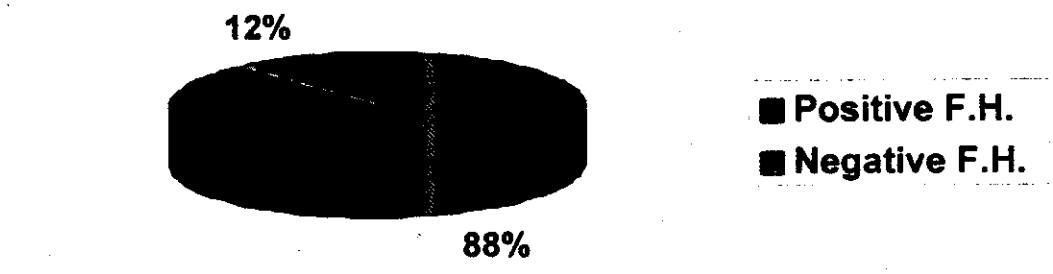


Fig. (15) : Chronological distribution of patients with CHCV and DM

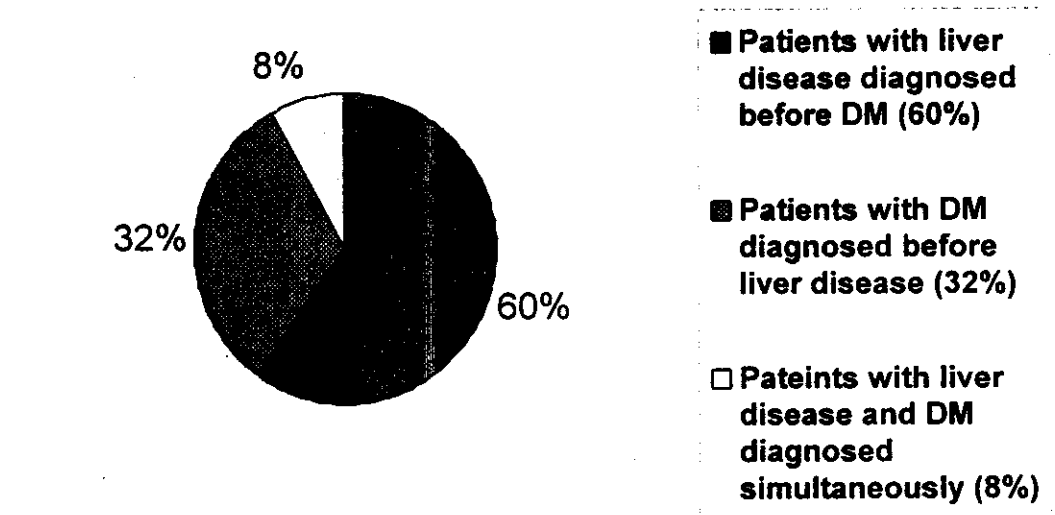


Fig. (16): Distribution of CHCV group with DM according to positivity of family history (F.H) of DM.

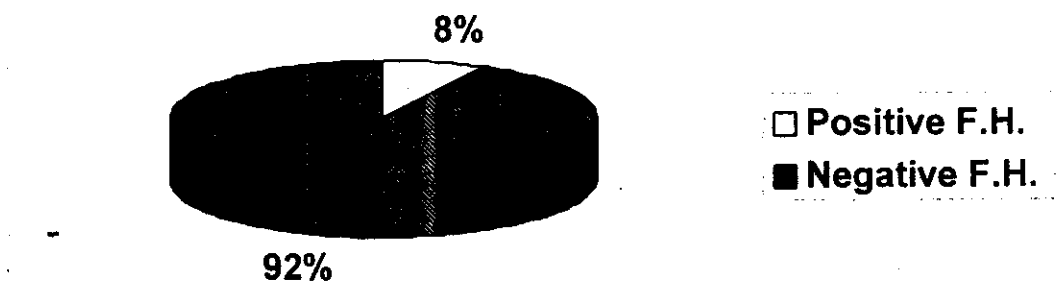


Fig. (17): Statistical comparison of the the mean values of the duration of HCV contamination (years) between CHCV group and CHCV group with DM.

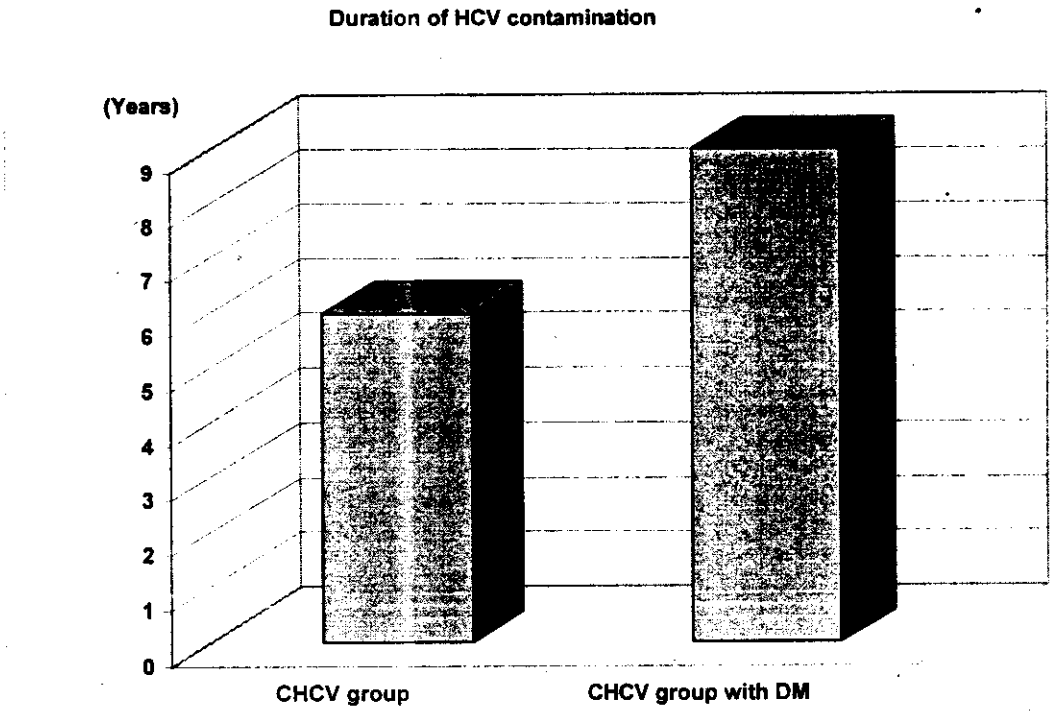


Fig. (18) : Statistical comparison of the duration of HCV contamination (years) between CHCV group and CHCV with DM group.

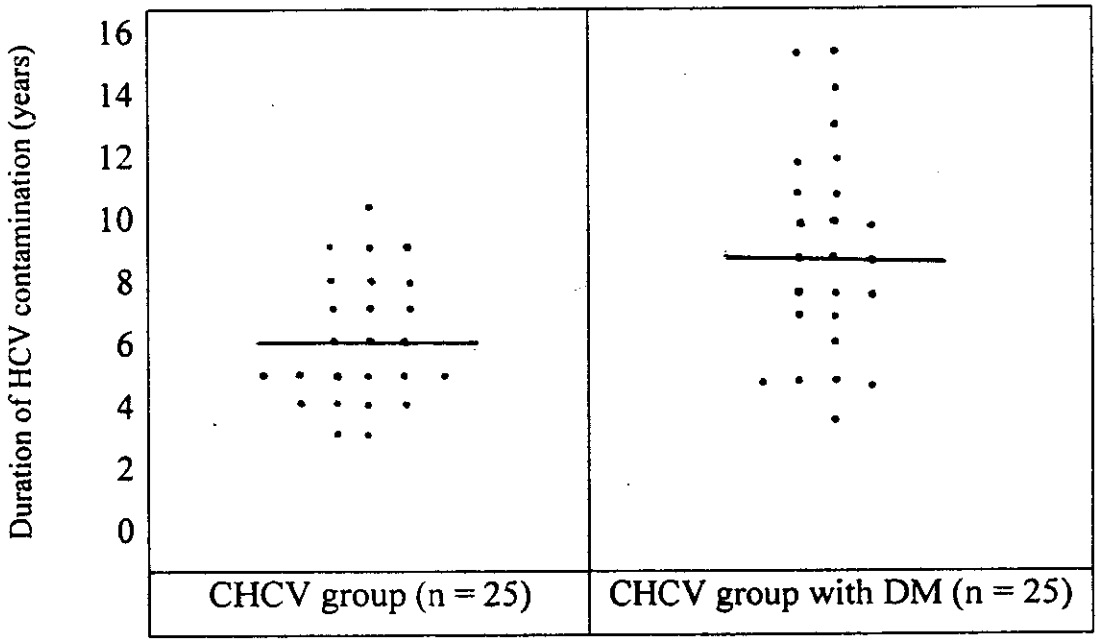


Fig. (19): Statistical comparison of the mean values of ALT (u/l) between the study and control groups.

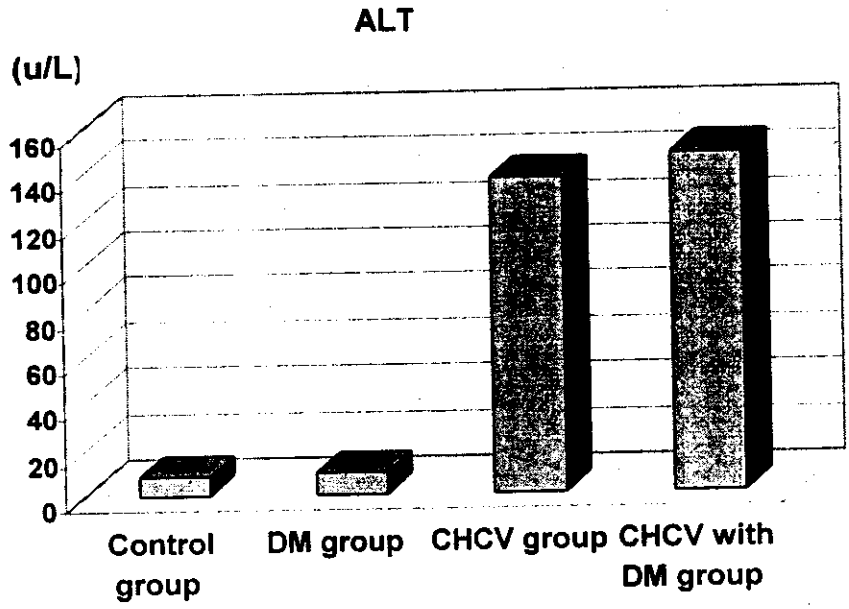
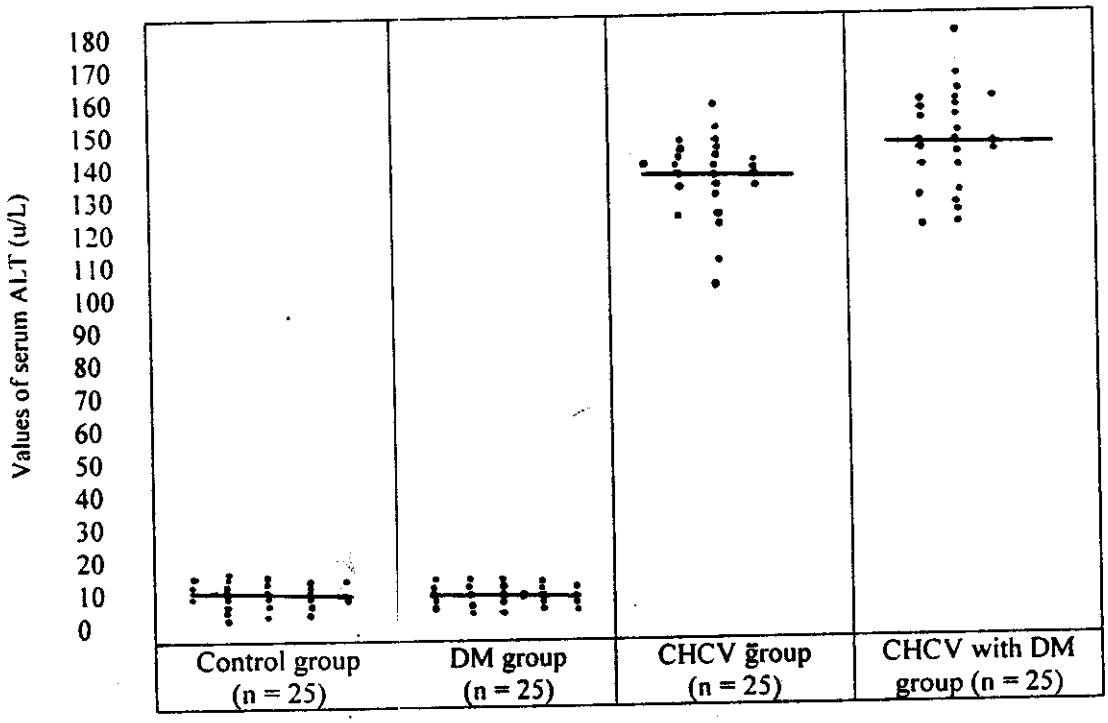


Fig. (20) : Statistical comparison of serum ALT (u/L) values between the study and control groups.



n = Number of subjects.

Fig. (21) : Statistical comparison of the mean values of AST (u/l) between the study and control groups.

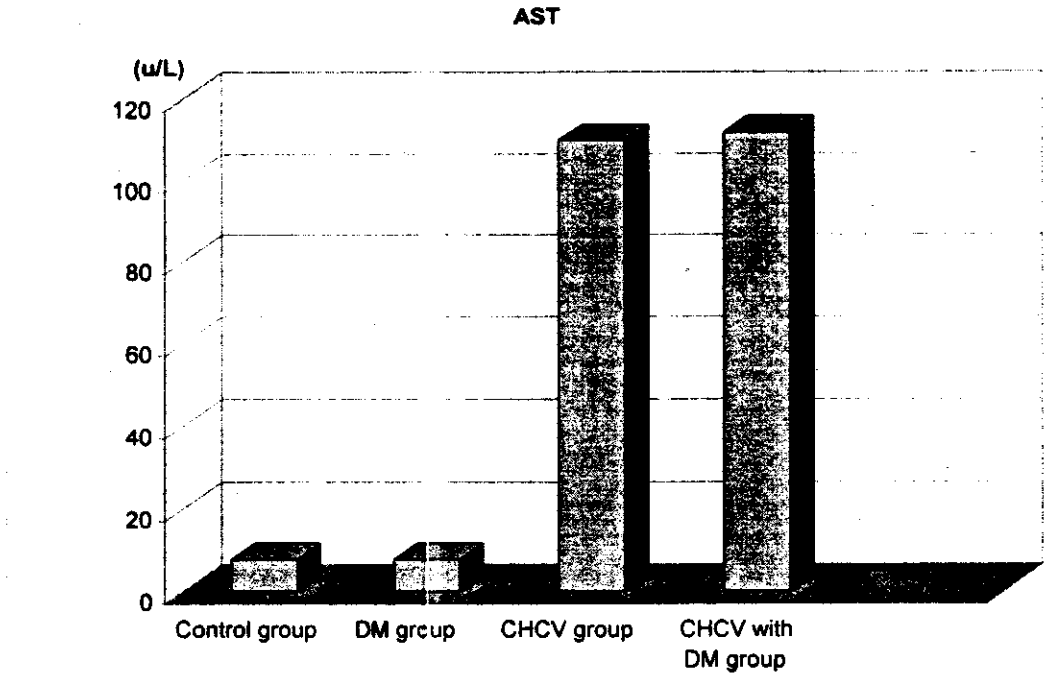
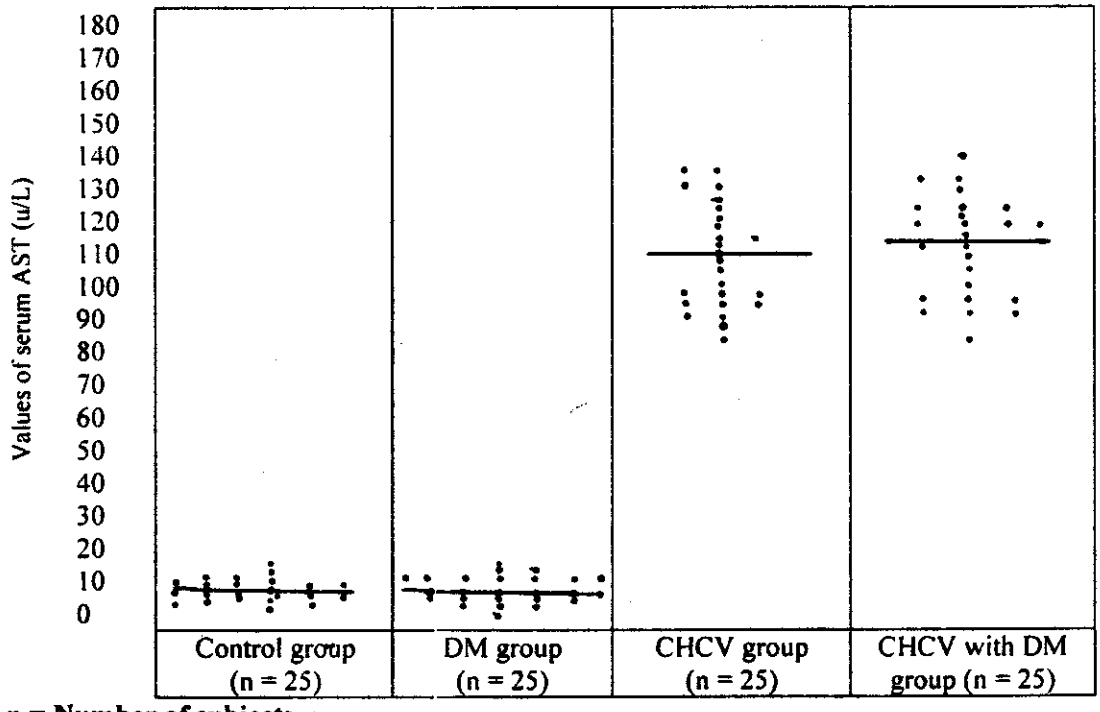


Fig. (22) : Statistical comparison of serum AST (u/L) values between the study and control groups.



n = Number of subjects.

Fig. (23): Statistical comparison of the mean value of serum fasting blood glucose (FG) (mg/ml) between the study and control groups.

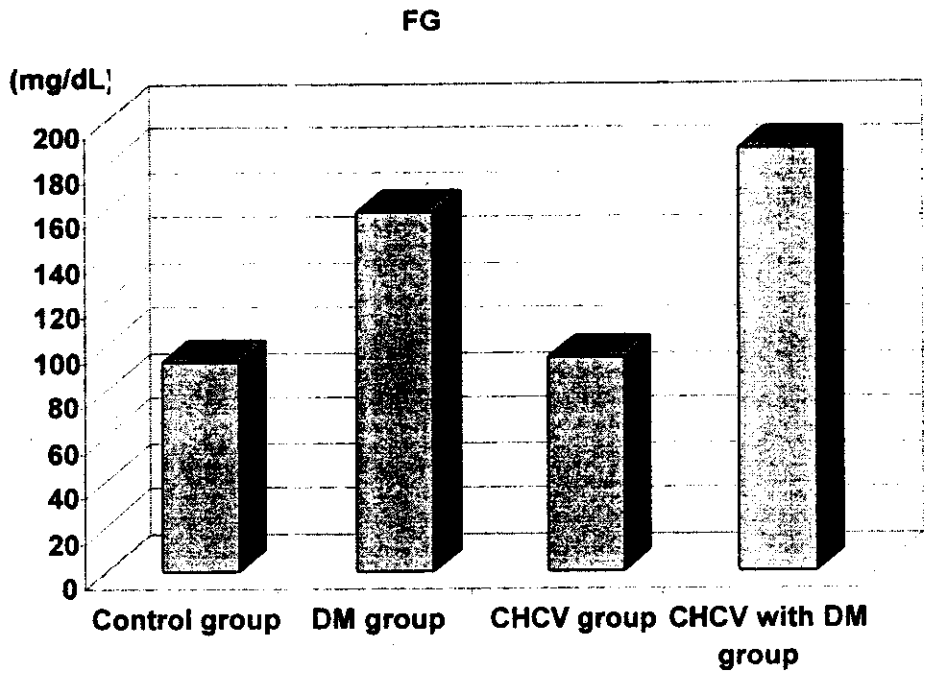
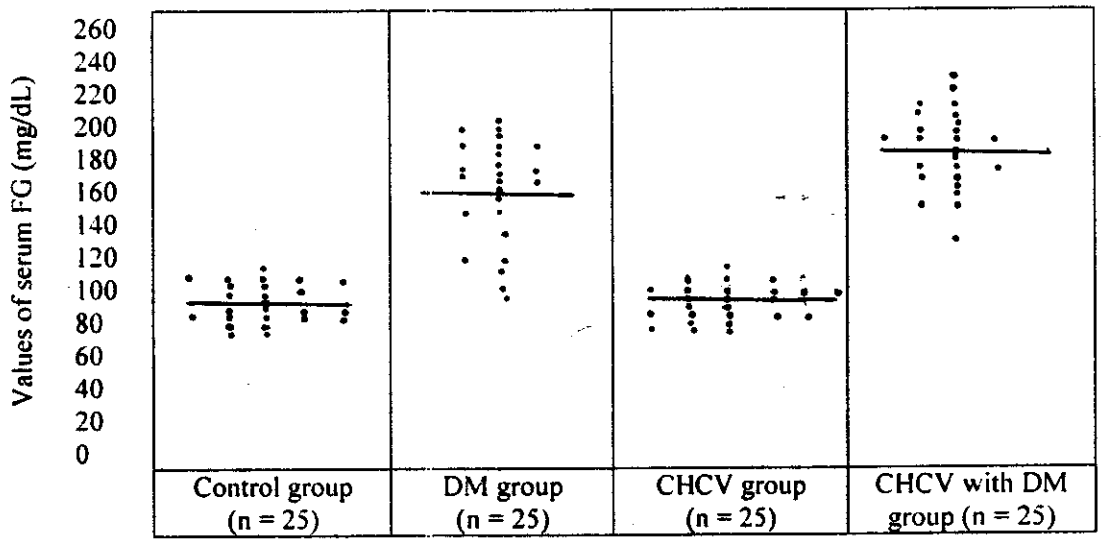


Fig. (24) : Statistical comparison of serum fasting blood glucose (FG) (mg/dL) values between the study and control groups.



n = Number of subjects.

Fig. (25): Statistical comparison of the mean value of serum 2-hours postprandial glucose) (2-HPG) (mg/ml) between the study and control groups.

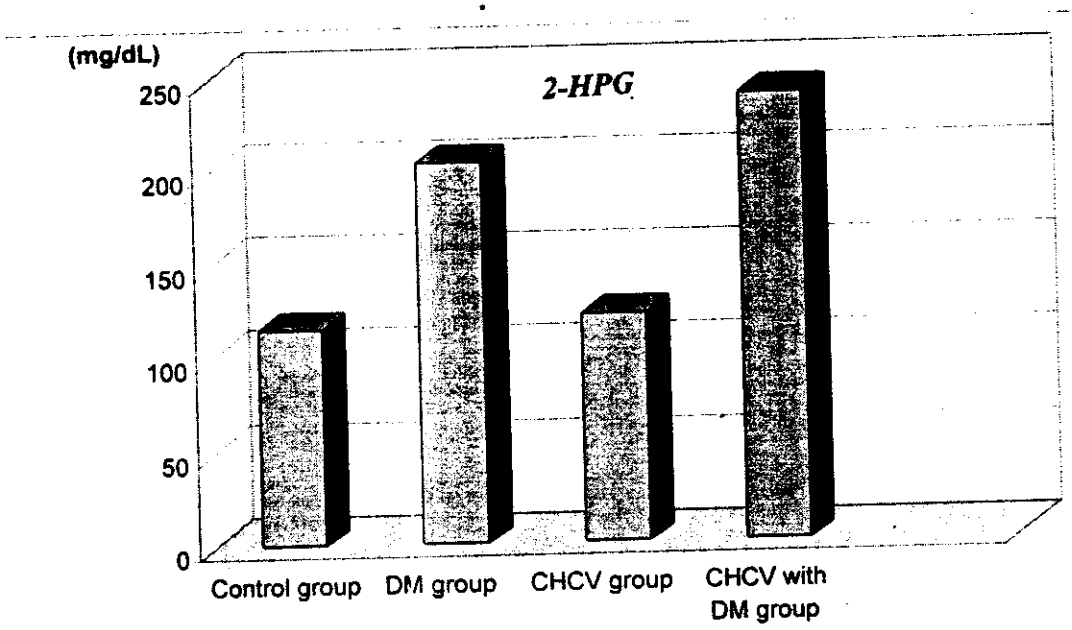
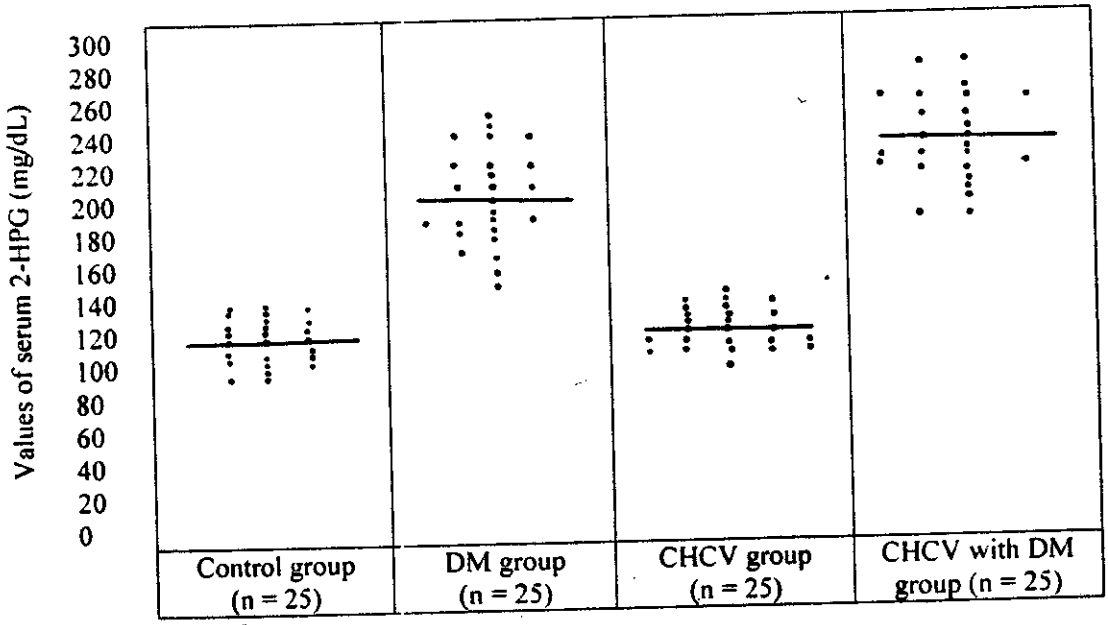


Fig. (26) : Statistical comparison of serum 2-hours postprandial glucose (2-HPG) (mg/dL) values between the study and control groups.



n = Number of subjects.

Fig. (27): Statistical comparison of the mean values of serum insulin (uiu/ml) between the study and control groups

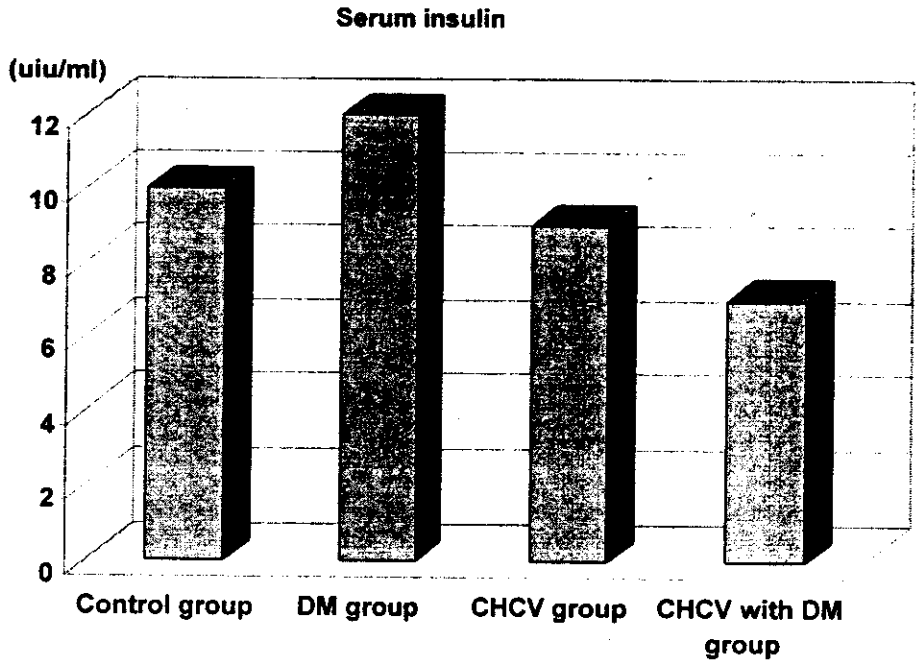
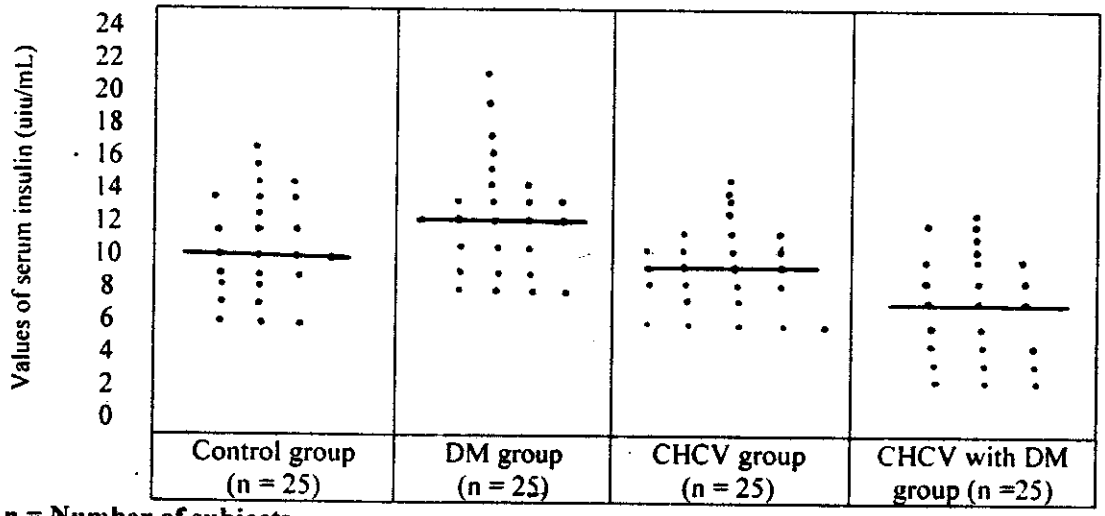


Fig. (28) : Statistical comparison of serum insulin (uiu/mL) values between the study and control groups



n = Number of subjects.

Fig. (29): Statistical comparison of the mean values of serum C-peptide (ng/ml) between the study and control groups.

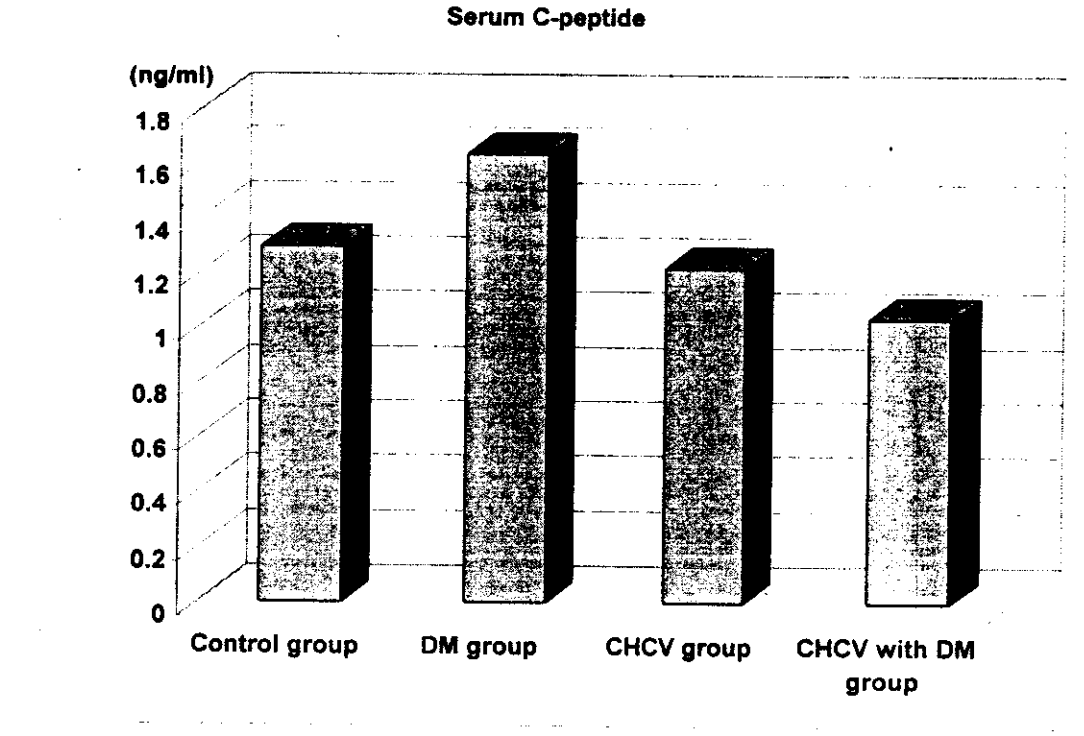
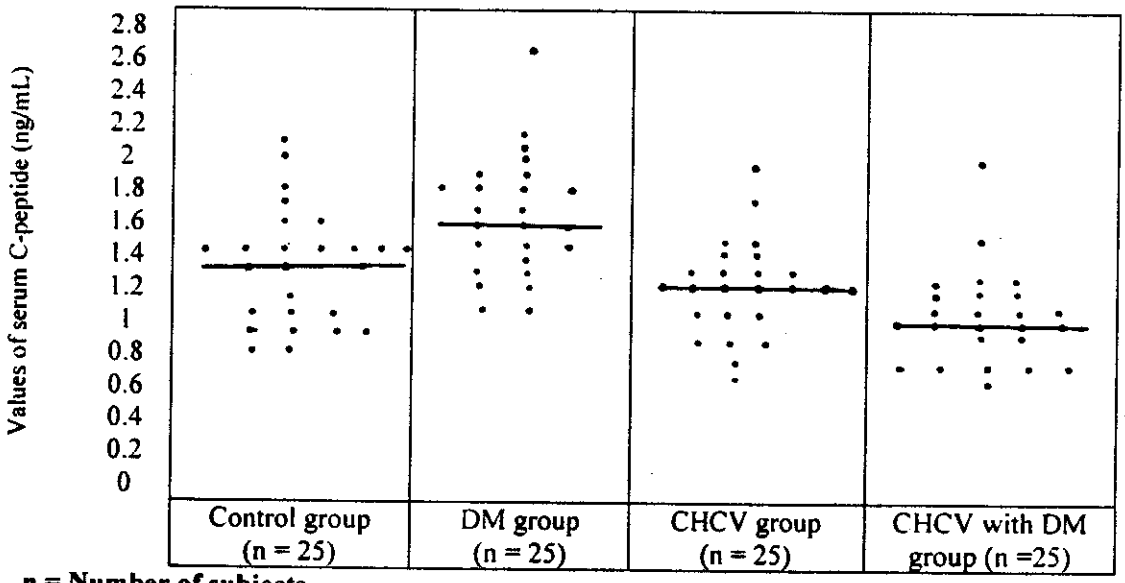


Fig. (30) : Statistical comparison of serum C-peptide (ng/mL) values between the study and control groups



n = Number of subjects.

Fig. (31): Statistical comparison of the mean values of serum amylase (u/l) between the study and control groups

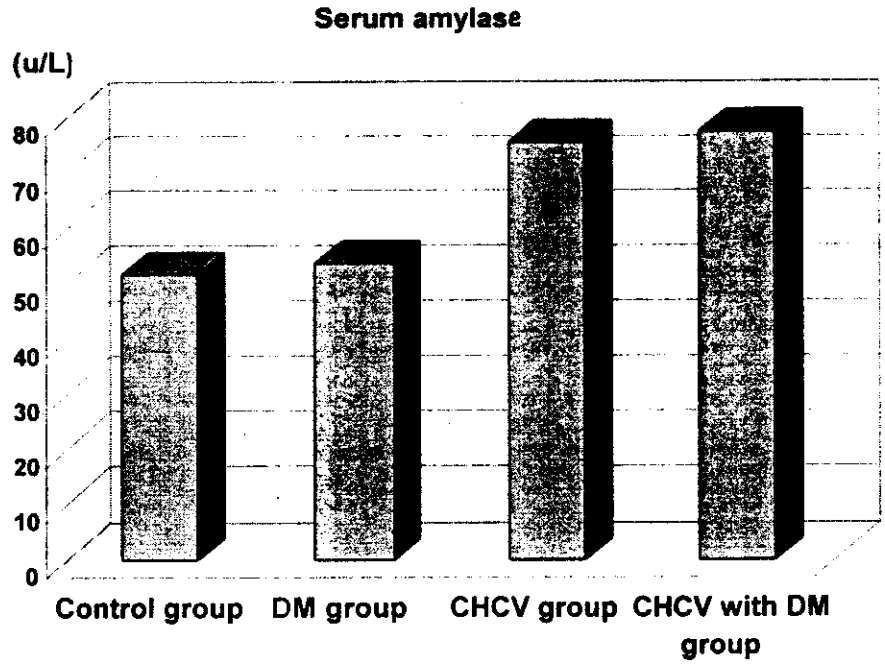
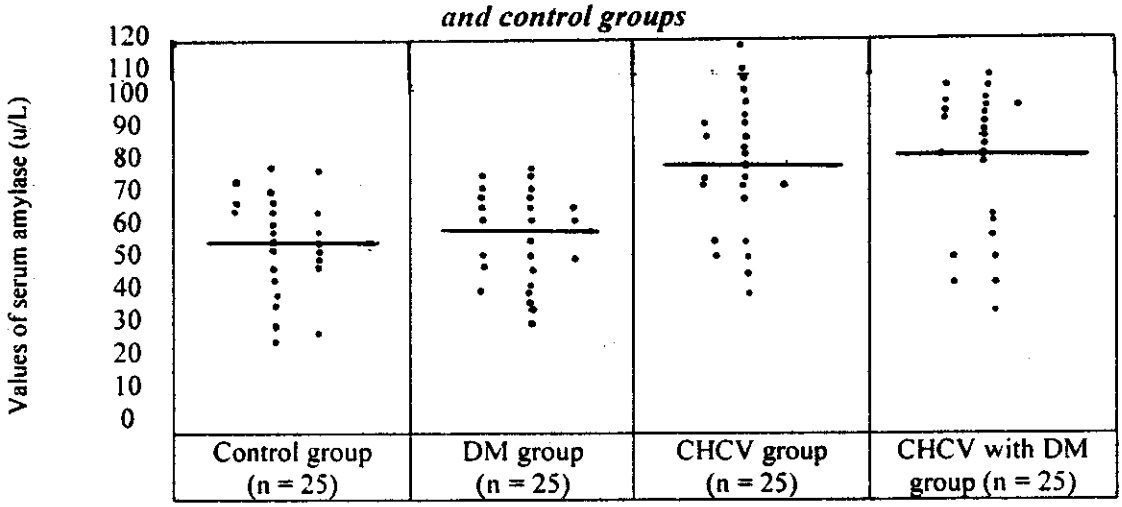


Fig. (32) : Statistical comparison of serum amylase (u/L) values between the study and control groups



n = Number of subjects.