RESULTS

Table (5): Baseline characters of the studied groups (N°=60).

Item		Cases (N=30)	Control (N=30)	t-test	P value
Age	Range	30-50	30 - 50	0.02	>0.05 NS
	Mean	39.93	39.97		
	SD	5.924	6.1		
BMI	Range	18-34	19 - 31	1.8	>0.05 N.S
	Mean	27.78	25.62		
	SD	4.275	5.5		
Sex	Male	16 (53.3%)	17 (56.7%)	0.3	>0.05 NS
	female	14 (46.7%)	13 (43.3%)		
Normal daily activity	+ve	25 (83.3%)	26 (86.7%)	0.4	>0.05 NS
	-ve	5 (16.7%)	4 (13.3%)		
Smoking	+ve	10 (33.3%)	8 (26.7%)	0.3	>0.05 NS
	-ve	20 (66.7%)	22 (73.3%)		
Previous vertebral fracture	+ve	1(3.3%)	0 (0%)	0.1	>0.05 N.S
	-ve	29 (96.7%)	30 (100%)		
1st degree family history of fracture	+ve	2 (6.7%)	3 (10%)	0.2	>0.05 N.S
	-ve	28 (93.3%)	27 (90%)		

This table shows no statistically significant difference between case and control groups as regards age, BMI, sex distribution, job category, smoking, previous vertebral fracture and 1st degree family history of fracture.
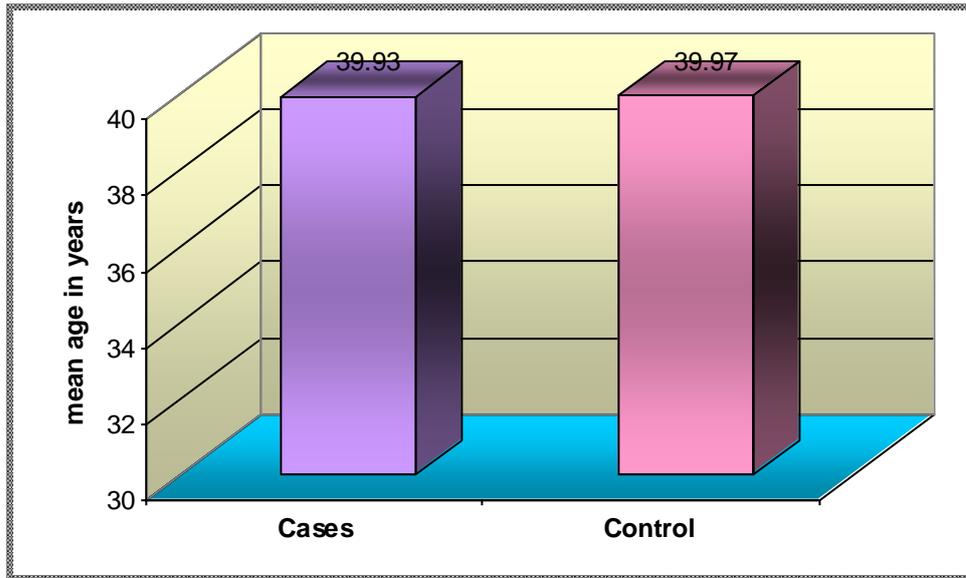
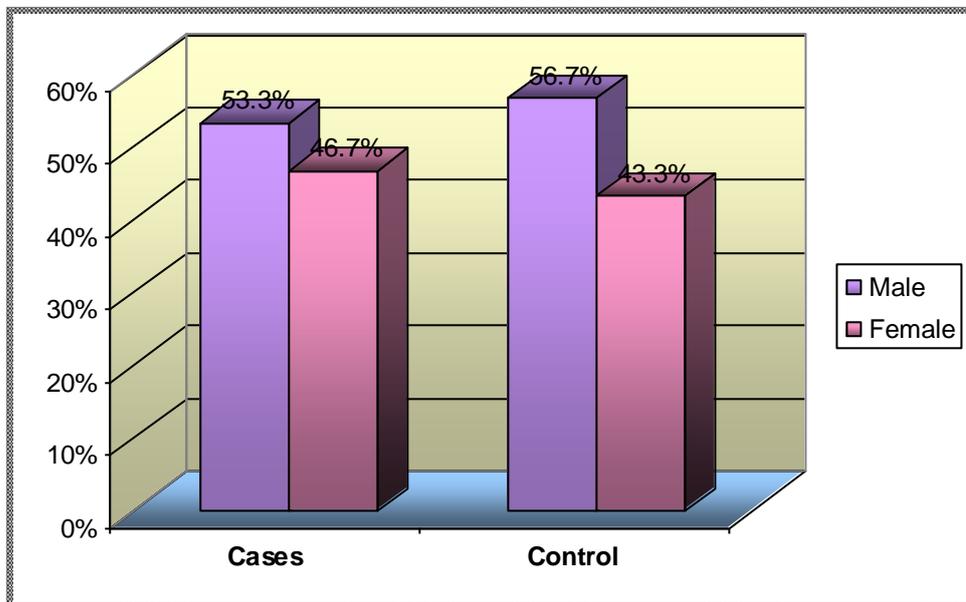*Fig. (9):* Comparison between the studied groups as regards age.
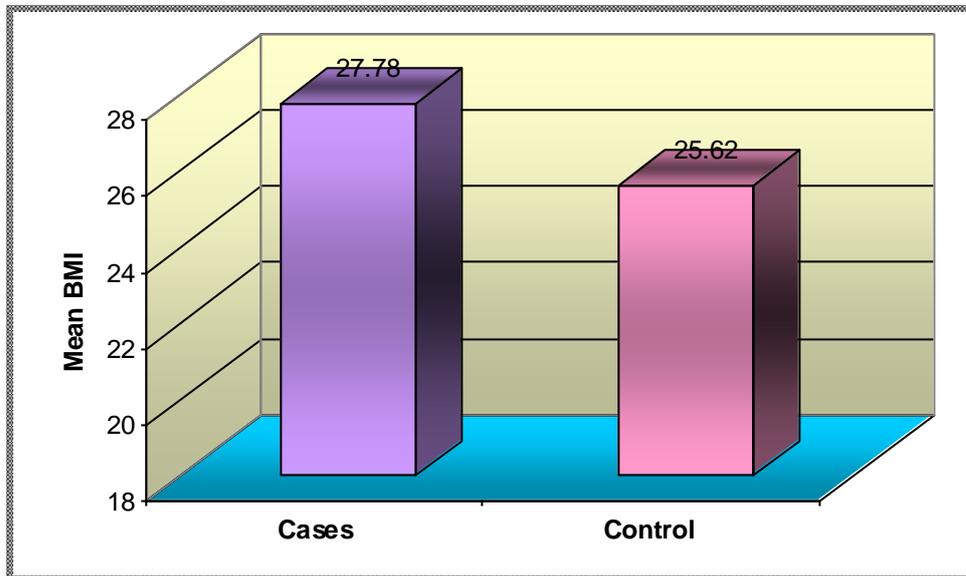

Fig. (10): Sex distribution among the studied groups.

Fig. (11): Comparison between the studied groups as regards BMI.

Table (6): Clinical data of the cases group (N°=30).

Item		N	Percentage
History of Blood transfusion	Negative	24	80%
	Positive	6	20%
History of Schistosomiasis	Negative	25	83.3%
	Positive	5	16.7%
Fatigability	Negative	6	20%
	Positive	24	80%
Bleeding tendency	Negative	28	93.3%
	Positive	2	6.7%
Pruritus	Negative	27	90%
	Positive	3	10%
Right hypochondrial pain	Negative	8	26.7%
	Positive	22	73.3%
Bone pain	Negative	24	80%
	Positive	6	20%
Jaundice	Negative	28	93.3%
	Positive	2	6.7%
LL. edema	Negative	29	96.7%
	Positive	1	3.3%
Hepatomegaly	Negative	28	93.3%
	Positive	2	6.7%
Splenomegaly	Negative	29	96.7%
	Positive	1	3.3%

Table (7): Laboratory findings in the cases group (N°=30).

	Range	Mean	Std. Deviation
S.Albumin gm/dl (N*=3.2-5.3)	3.2- 5.0	4.170	0.4970
PT sec. (control=13.5)	12- 15	12.93	0.944
ALT Iu/ml (N= up to 40)	12- 126	38.00	24.705
AST Iu/ml (N=up to 40)	18- 140	40.03	25.904
Bilirubin mg/dl (N=0.1-1.2)	0.6- 1.4	0.957	0.1675
S.creatinine mg/dl (N=0.4-1.4)	0.4 – 1.5	0.99	0.173
Alk.Phos. Iu/ml (N=30-300)	59- 220	105.40	36.340
Hb% g/dl (N=♂14-18 ♀11-16)	11.3- 15.	13.470	0.9200
Tot.Calcium mg/dl (N=9-10.5)	27.7- 10.3	9.010	0.7443
Phosphorus mg/dl (N=2.4-5)	2.7- 4.4	3.44	0.53
PTH µg/dL (N=20-70)	54-158	86.7	29.234

*N: normal level

Table (8): **Comparison between the case and control groups regarding the BMD.**

BMD	Group	% of subjects with ↓BMD	Range	Mean	Std. deviation	*P
Lumbar Vert. (L2-L4)	Cases	52.5%	-3 to 1	-0.97	1.2	<0.05 (Sig)
	Control	0%	-1 to 1	-0.09	0.75	
FN	Cases	47.4%	-3.4 to 1.8	-0.883	1.54	<0.05 (Sig)
	Control	0%	-1.3 to 1.3	-0.09	0.85	

*Mann-Whitney Test

This table shows a statistically significant difference in BMD of lumbar and femur neck (DEXA scan) between the case &control groups.
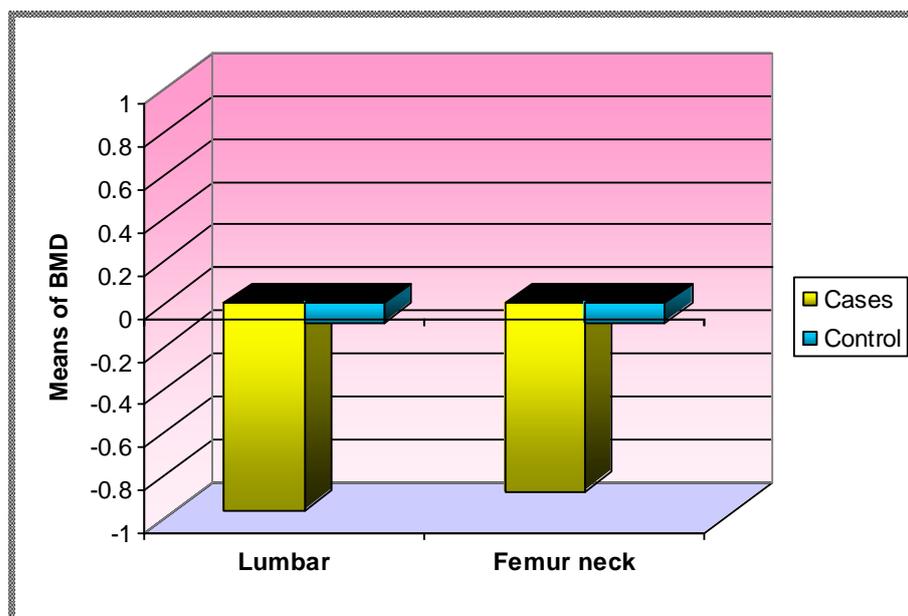

Fig. (12): Comparison between the case and control groups regarding the BMD.

Table (9): Correlation between necroinflammatory grades in liver biopsy and BMD in case group.

METAVIR grades	BMD-Femur Neck			BMD-Lumbar		
	Normal (n=16)	Osteopenia (n=7)	Osteoprosis (n=7)	Normal (n=15)	Osteopenia (n=7)	Osteoprosis (n=8)
A_0	2	0	0	2	0	0
A_1	8	2	1	7	1	2
A_2	6	3	2	6	3	2
A_3	0	2	4	0	3	4
r	-0.58			-0.51		
P - value	<0.05			<0.05		

This table shows a statistically significant negative correlation between necroinflammatory grades in liver biopsy and BMD in lumbar and femur neck DEXA scan in the studied cases (p-value <0.05).
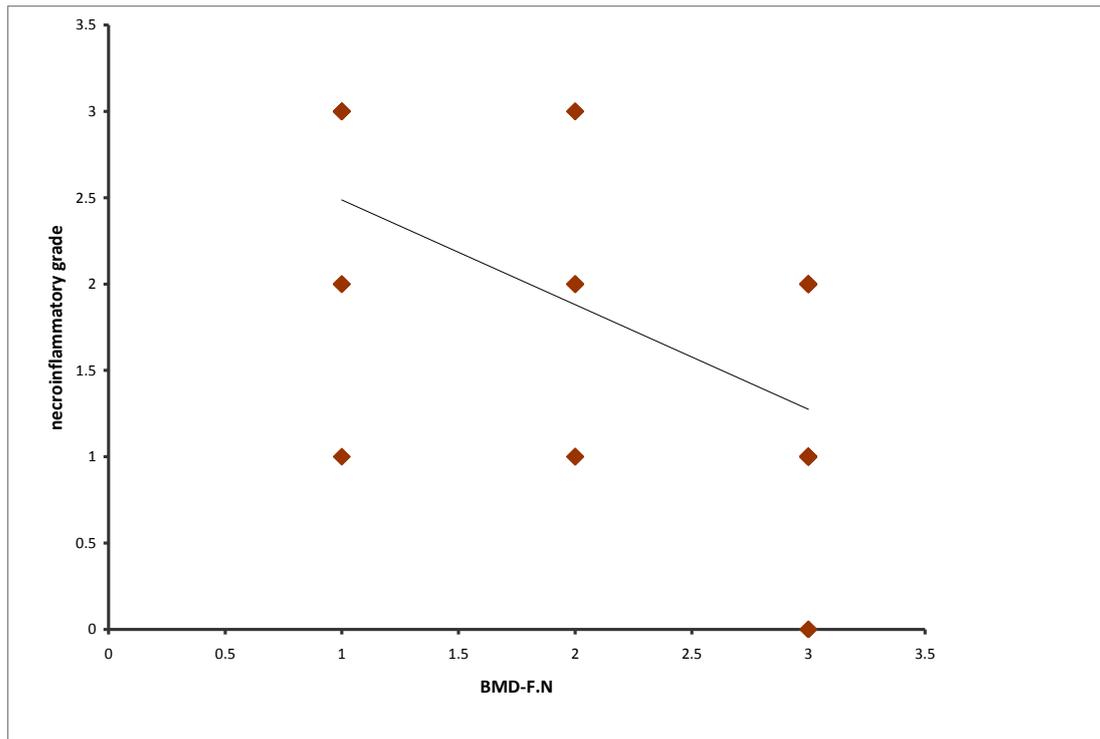
Fig. (13): Shows significant negative correlation between necroinflammatory grades and BMD at Femur neck.
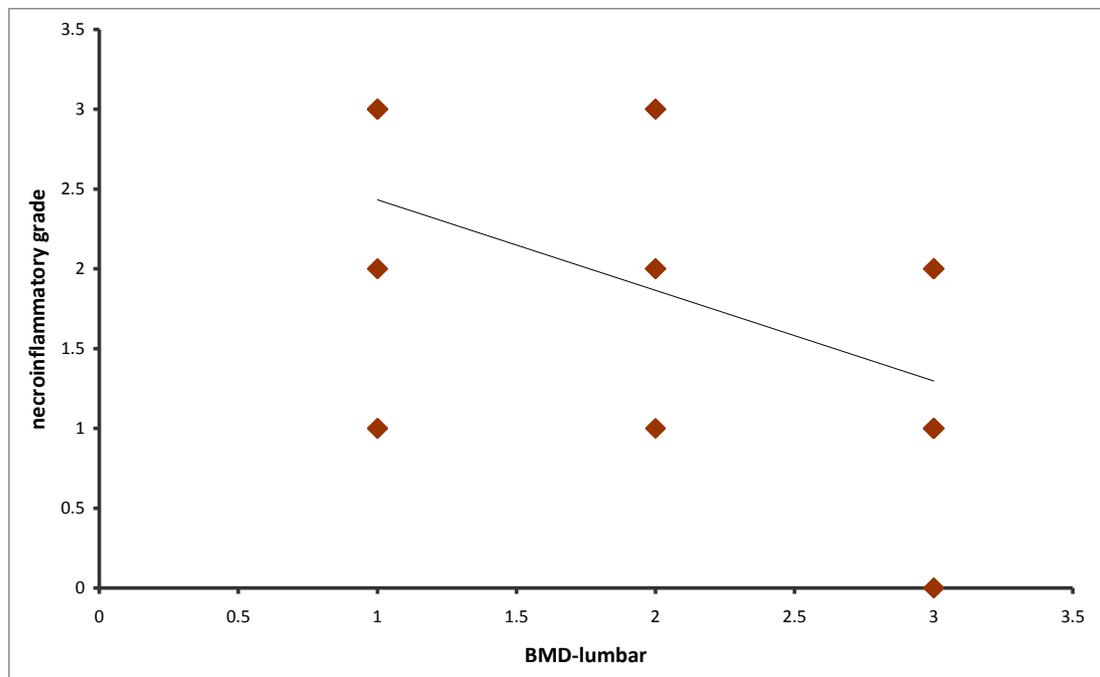

Fig. (14): Shows significant negative correlation between necroinflammatory grades and BMD at lumbar region.

Table (10): Correlation between fibrosis stages in liver biopsy and BMD in case group.

METAVIR fibrosis	BMD-Femur Neck			BMD-Lumbar		
	Normal (n=16)	**Osteopenia (n=7)**	**Osteoprosis (n=7)**	**Normal (n=15)**	**Osteopenia (n=7)**	**Osteoprosis (n=8)**
F0	6	0	1	6	1	0
F1	5	2	1	5	1	2
F2	3	2	2	3	2	2
F3	2	3	3	1	3	4
r	-0.39			-0.52		
P value	<0.05			<0.05		

This table shows a statistically significant negative correlation between fibrosis stage in liver biopsy and BMD in lumbar and femur neck DEXA scan in the studied cases.

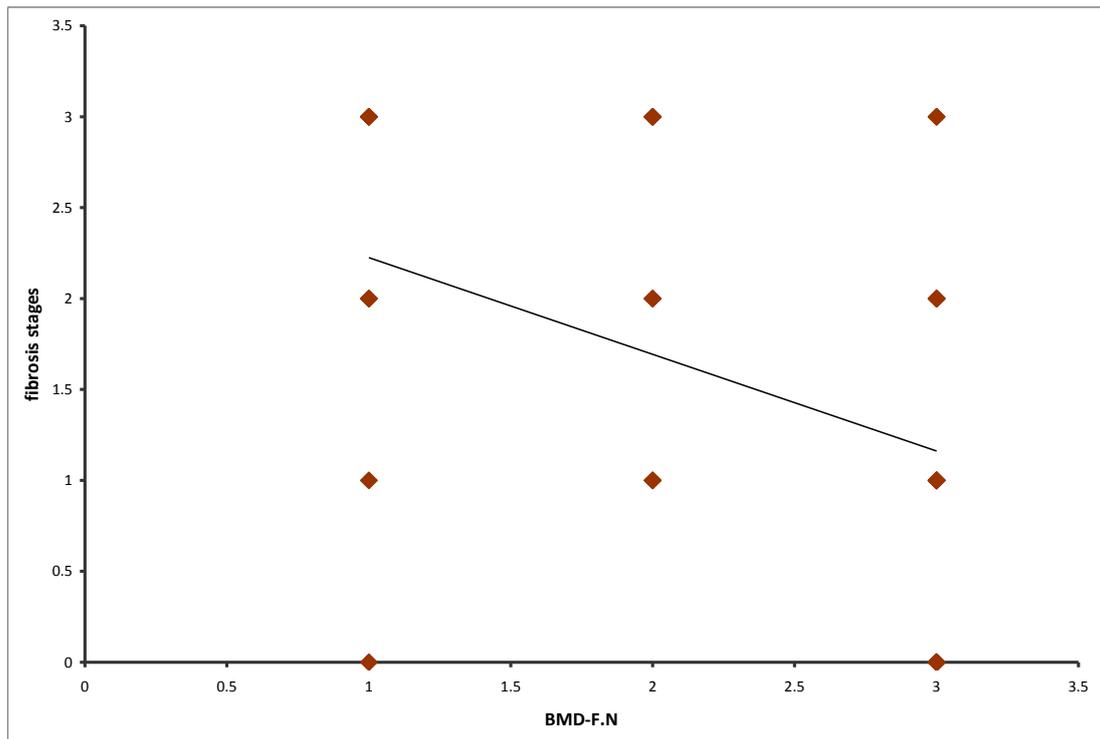**N.B** cirrhotic patients (METAVIR F4) were excluded from this study.

Fig. (15): Shows a statistically significant negative correlation between fibrosis stage and BMD in Femur neck.
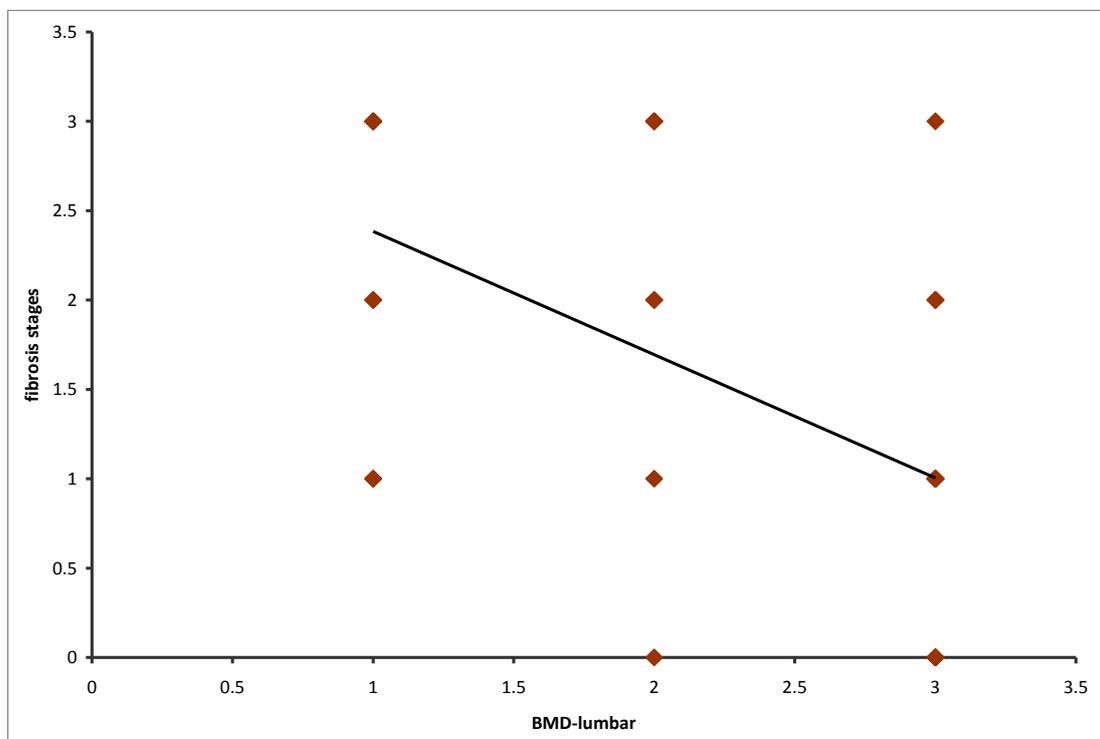

Fig. (16) Shows a statistically significant negative correlation between fibrosis stage and BMD in lumbar region.

Table (11): Correlation between hepatitis C viral load and BMD in the studied cases.

HCV-RNA PCR (quantitative) IU/ml	BMD-Femur Neck			BMD-Lumbar		
	Normal (n=16)	Osteopenia (n=7)	Osteoprosis (n=7)	Normal (n=15)	Osteopenia (n=7)	Osteoprosis (n=8)
Low viremia (600-2.5×10^5	5	2	3	5	2	3
moderate viremia (2.5×10^5-2.5×10^6)	5	2	2	5	2	2
high viremia (>2.5×10^6)	6	3	2	5	3	3
r	0.1			0.1		
P value	>0.05			>0.05		

This table shows that the hepatitis C viral load had non significant correlation to the BMD in the studied cases.
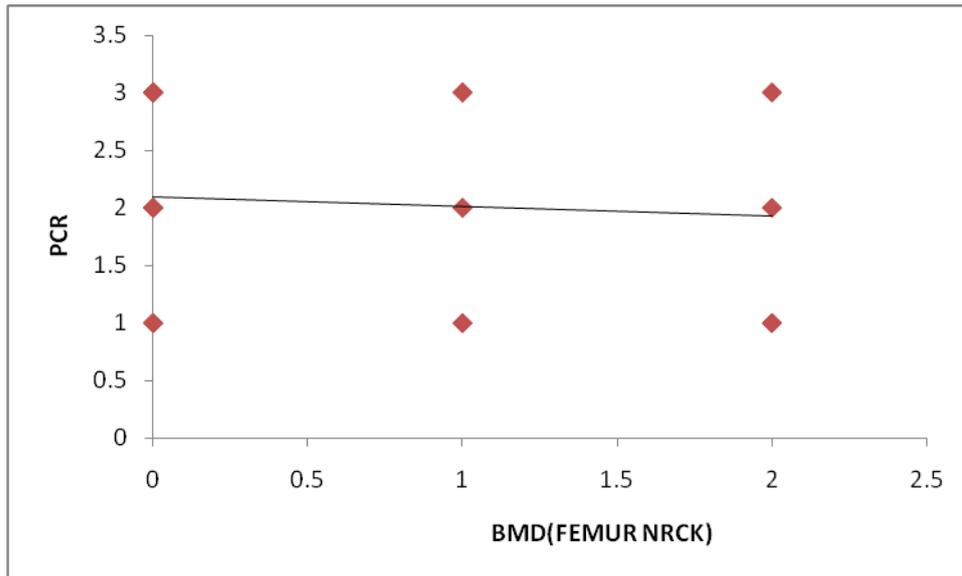
Fig. (17): Shows that hepatitis C viral load had non significant correlation to the BMD at Femur neck.
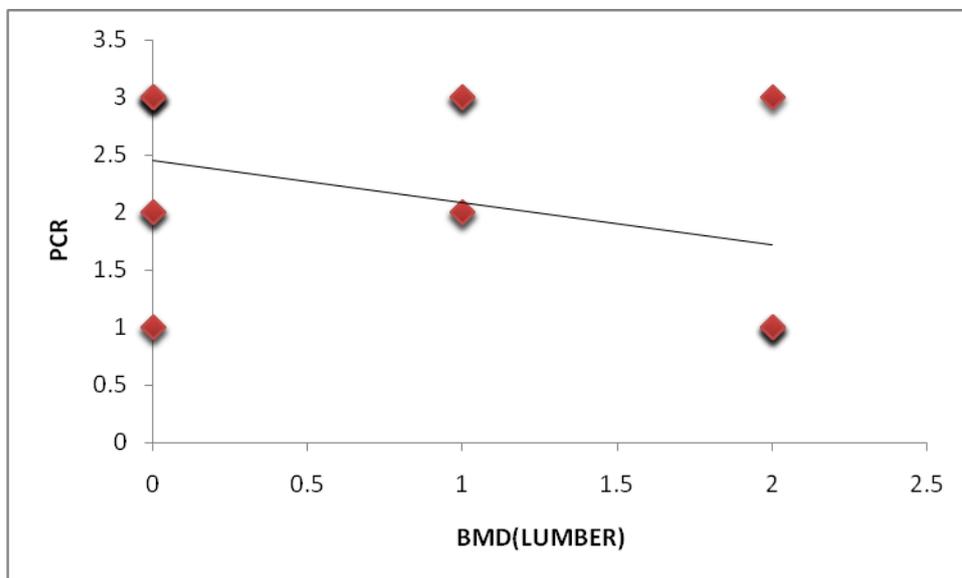

Fig. (18): Shows that hepatitis C viral load had non significant correlation to the BMD at lumbar regions.

Table (12): Correlation between BMD and different variables in the studied group:

	FN		Lumbar	
	r	P	r	P
Age	-0.1	>0.05	-0.2	>0.05
BMI	0.1	>0.05	0.1	>0.05
Smoking	-0.1	>0.05	-0.1	>0.05
S.Albumin	0.1	>0.05	0.2	>0.05
S.Tot.Calcium	0.2	>0.05	0.05	>0.05
S.Phosphorus	0.1	>0.05	0.2	>0.05
PT	-0.2	>0.05	-0.2	>0.05
AST	-0.1	>0.05	-0.2	>0.05
ALT	-0.02	>0.05	-0.1	>0.05
Bilirubin	-0.03	>0.05	-0.02	>0.05
S.creatinine	0.1	>0.05	0.1	>0.05
Alkaline phosphatase	-0.3	>0.05	-0.2	>0.05
S.PTH	-0.32	<0.05*	-0.52	<0.05*

This table shows a statistically significant inverse correlation between S.PTH level & BMD at both the femoral neck & vertebral regions while, all the other assessed variables showed non significant correlation.
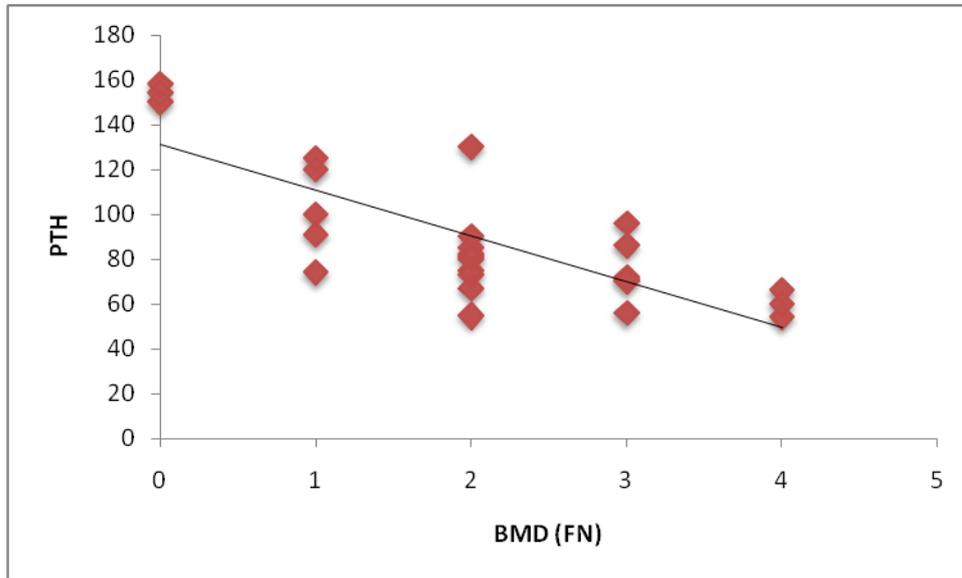
Fig. (19): shows a statistically significant inverse correlation between S.PTH level & BMD at Femur neck.
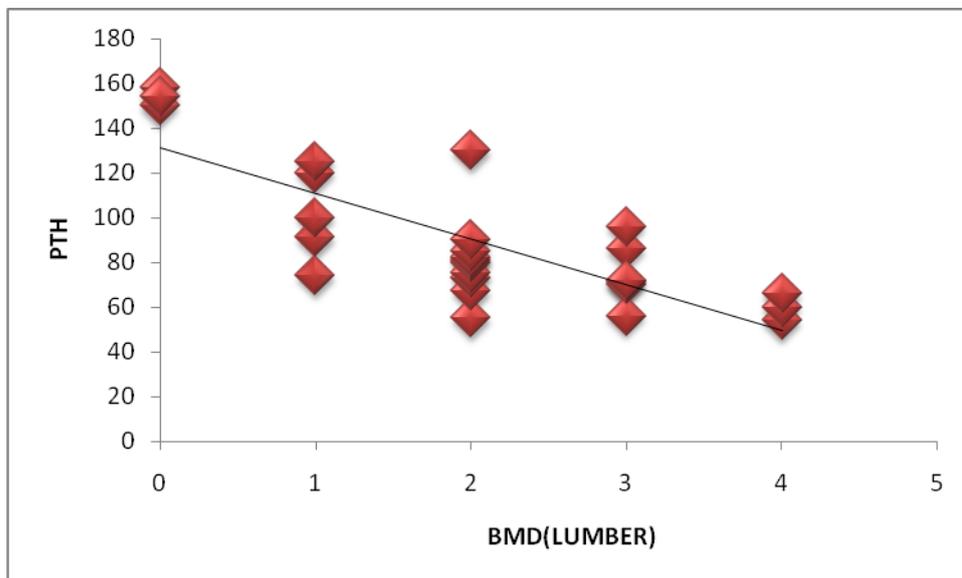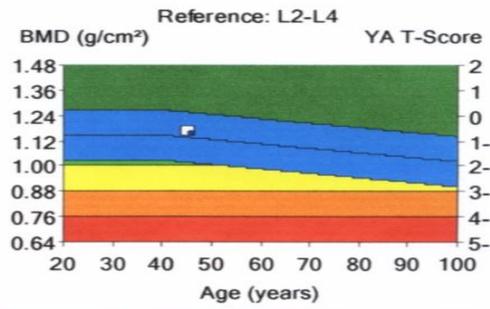

Fig. (20): shows a statistically significant inverse correlation between S.PTH level & BMD at lumbar regions.

AP Spine Bone Density

T12
L1
L2
L3
L4

Reference: L2-L4
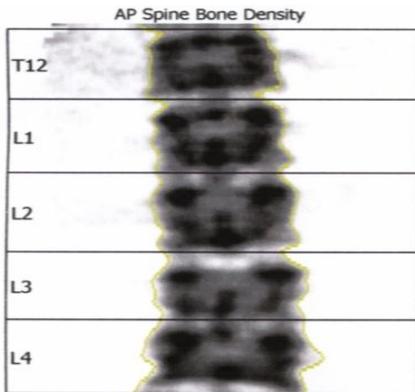
BMD (g/cm²)   YA T-Score

Region	BMD [1] (g/cm²)	Young-Adult [2] (%)	T-Score	Age-Matched [3] (%)	Z-Score
L1	1.127	97	0.3-	107	0.6
L2	1.149	93	0.8-	101	0.1
L3	1.140	92	0.8-	100	0.0
L4	1.205	97	0.3-	106	0.6
L1-L2	1.139	95	0.5-	104	0.3
L1-L3	1.139	94	0.6-	103	0.3
L1-L4	1.158	95	0.5-	104	0.3
L2-L3	1.145	92	0.8-	101	0.1
L2-L4	1.167	94	0.6-	103	0.2
L3-L4	1.176	95	0.5-	103	0.3

COMMENTS: NORMAL BONE MINERAL DENSITY OF LUMBAR SPINE.

Left Femur Bone Density

Reference: Neck
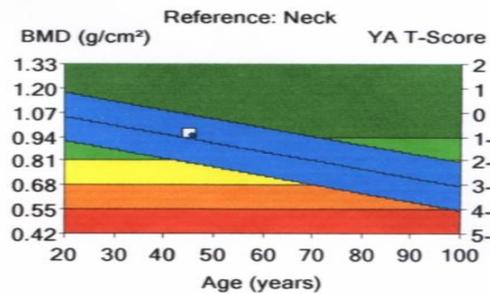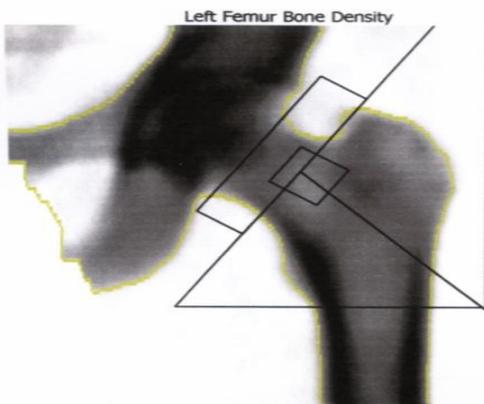
BMD (g/cm²)   YA T-Score

Region	BMD [1] (g/cm²)	Young-Adult [2] (%)	T-Score	Age-Matched [3] (%)	Z-Score
Neck	0.965	90	0.8-	104	0.3
Wards	0.812	85	1.1-	102	0.1
Troch	0.907	98	0.2-	109	0.7
Shaft	1.147	-	-	-	-
Total	1.018	93	0.6-	106	0.4

COMMENTS: NORMAL BONE MINERAL DENSITY OF LEFT FEMUR NECK.

Fig. (21): shows report of DEXA scan of a normal patient.

T score (F.N) = -0.8

T score (Lumbar) = -0.6

AP Spine Bone Density

L2

L3

L4

Reference: L2-L4

BMD (g/cm²)   YA T-Score

1.44 Normal — 2
1.32 — 1
1.20 — 0
1.08 — 1-
0.96 Osteopenia — 2-
0.84 — 3-
0.72 — 4-
0.60 Osteoporosis — 5-
20 30 40 50 60 70 80 90 100

Age (years)

Region	BMD¹ (g/cm²)	Young-Adult² (%)	T-Score	Age-Matched³ (%)	Z-Score
L2-L4	0.988	82	1.8-	90	0.9-

COMMENTS: OSTEOPENIA OF LUMBER SPINE FOR MEDICAL
TREATMENT AND FOLLOW UP AFTER ONE YEAR

Left Femur Bone Density

Reference: Neck

BMD (g/cm²)   YA T-Score

1.22 Normal — 2
1.10 — 1
0.98 — 0
0.86 — 1-
0.74 Osteopenia — 2-
0.62 — 3-
0.50 — 4-
0.38 Osteoporosis — 5-
20 30 40 50 60 70 80 90 100

Age (years)

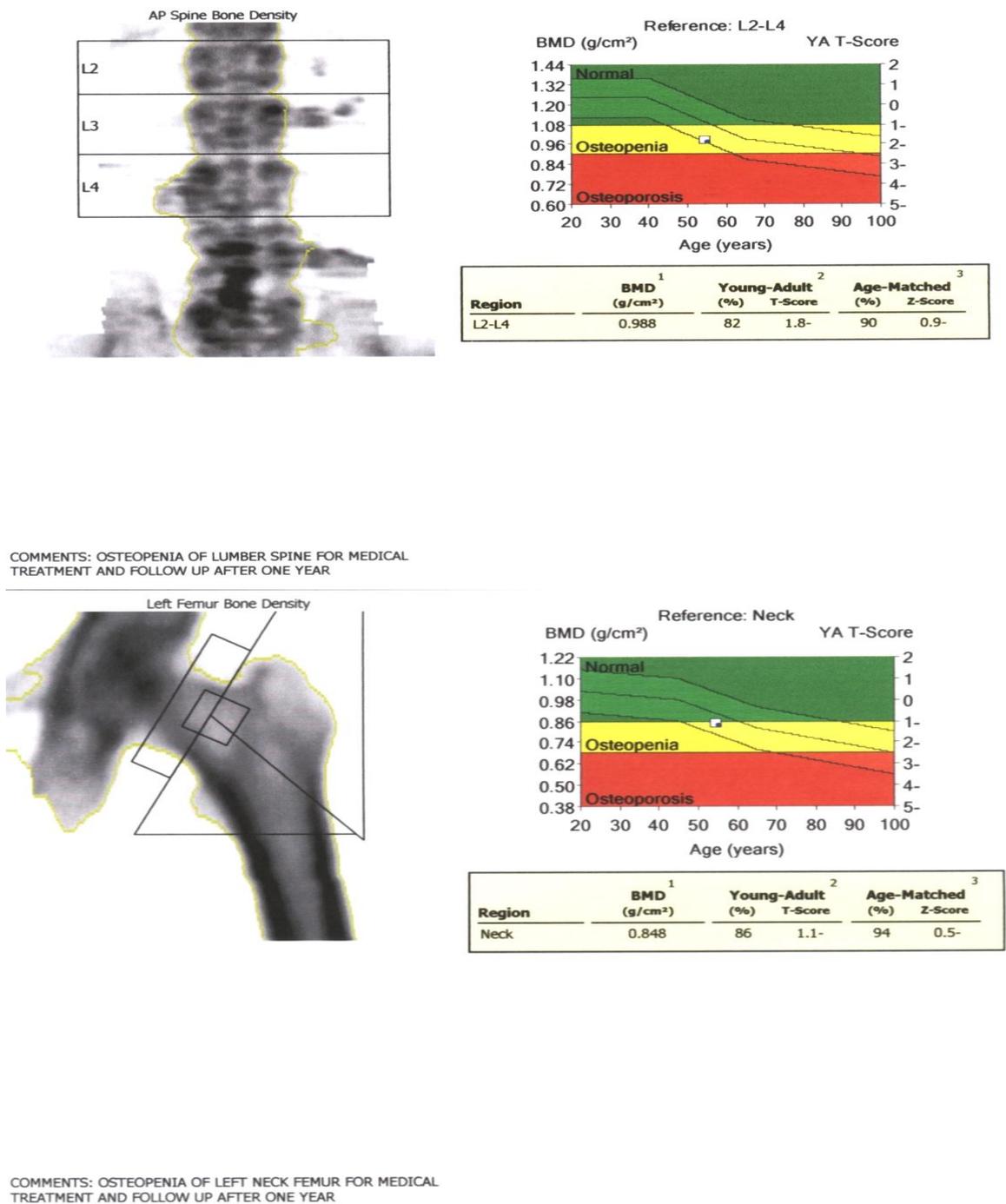| Region	BMD¹ (g/cm²)	Young-Adult² (%)	T-Score	Age-Matched³ (%)	Z-Score
Neck	0.848	86	1.1-	94	0.5-

COMMENTS: OSTEOPENIA OF LEFT NECK FEMUR FOR MEDICAL
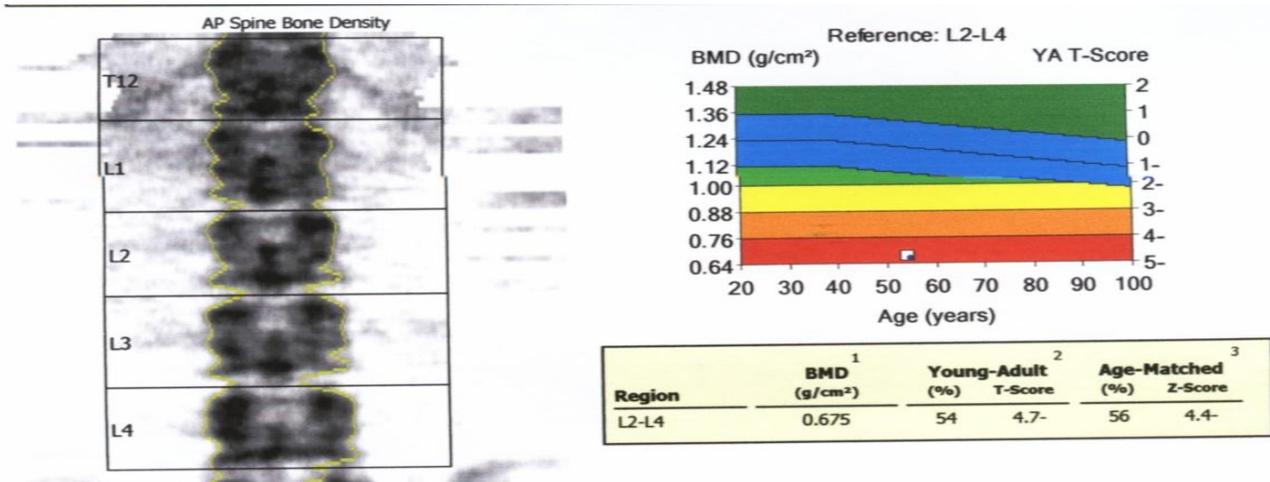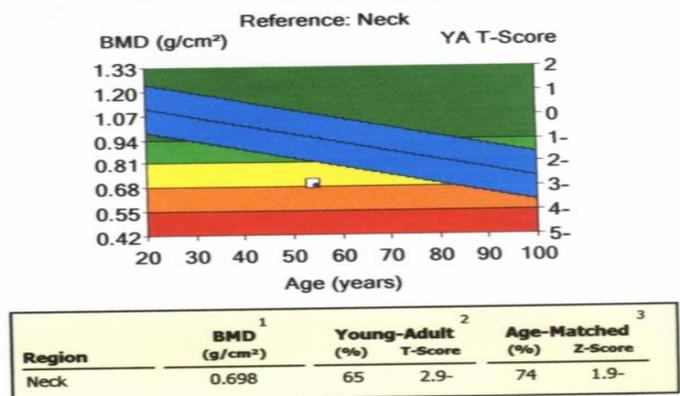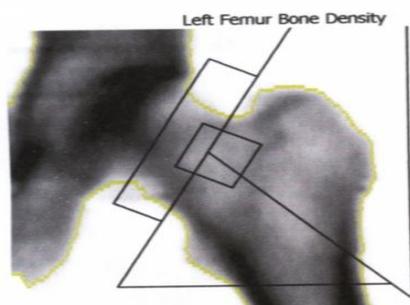TREATMENT AND FOLLOW UP AFTER ONE YEAR

.

Fig. (22): shows report of DEXA scan of a patient with osteopenia in both F.N and lumbar spine.

T score (F.N) = -1.1

T score (Lumbar) = -1.8

AP Spine Bone Density

T12
L1
L2
L3
L4

Reference: L2-L4

BMD (g/cm²)   YA T-Score

Region	BMD [1] (g/cm²)	Young-Adult [2] (%)	T-Score	Age-Matched [3] (%)	Z-Score
L2-L4	0.675	54	4.7-	56	4.4-

COMMENTS: osteoporosis of lumber spine

Left Femur Bone Density

Reference: Neck

BMD (g/cm²)   YA T-Score

Region	BMD [1] (g/cm²)	Young-Adult [2] (%)	T-Score	Age-Matched [3] (%)	Z-Score
Neck	0.698	65	2.9-	74	1.9-

COMMENTS: osteoporosis of left neck femur

Fig (23): shows report of DEXA scan of a patient with osteoporosis in both F.N and lumbar regions.

T score (F.N) = - 2.9

T score (lumbar) = - 4.7