Effects of Eradication of HCV on Bone Mineral Density in HIV/HCV-Coinfected Patients

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Abstract # 1344

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Background and Aim

- Established cirrhosis is generally associated with osteoporosis; however, there is still some debate about the association between non-cirrhotic chronic HCV infection and osteoporosis.
- HCV infection has been associated with an increased risk of bone loss and fracture in HIV-infected persons. The mechanism is not well understood and may involve severity of liver disease, a reduction in bone mineral density (BMD), or microstructural abnormalities associated with HCV infection [1-3]. Nevertheless, unmeasured confounders, including behavioral and nutritional factors, have not been completely ruled out.
- Our study aimed to assess the effects of eradication of HCV on BMD in HIV/HCV-coinfected persons in order to obtain additional information about the impact of HCV infection on BMD in this population group.

1. Maalouf NM, et al. J Bone Miner Res 2013; 28(12): 2577-83.
2. Bedimo R, et al. AIDS 2016; 30(4): 601-8.
3. Bedimo RJ, et al. Clin Infect Dis 2018; 66(9): 1442-7.

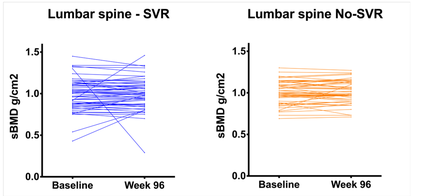
Methods

Design	• We prospectively analyzed BMD at baseline and 96 wk after initiation of anti-HCV therapy (Rx) in HIV/HCV-coinfected patients. • Patients were recruited during 2012 – 2014 in 13 centers
Variables	• Demographics, BMI, variables related to HIV, HCV, comorbidities, smoking and substance abuse, laboratory parameters (hematology, biochemistry, immunology, and virology). • BMD was assessed using dual-energy X-ray absorptiometry (DXA) at the lumbar spine and femoral neck. • As different densitometers were used (Hologic® [n=8], Lunar® [n=3], and Norland® [n=2]), standardized BMD (sBMD) was also calculated based on published equations[1,2]. • Liver stiffness (LS) was determined using transient elastography (TE) with FibroScan®, EchoSens, Paris, France.
Definitions	• Osteoporosis, T score ≤−2.5 SD • Osteopenia, T score between −1 and −2.5 SD. • Cirrhosis, LS >12.5 kPa

Hui SL, et al. J Bone Miner Res 1997; 12(9): 1463-70.
Lu Y, et al. Osteoporos Int 2001; 12(6): 438-44.

Changes in lumbar spine sBMD

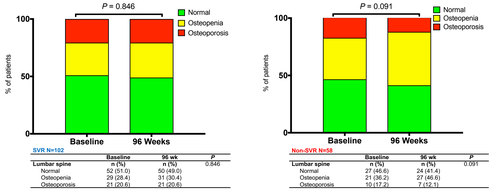
Results from patients with paired DXA studies



Variable – median (IQR)	SVR	Non-SVR	*P*
sBMD – g/cm²	N=52	N=84	
Baseline	1.00 (0.92; 1.11)	1.02 (0.89; 1.14)	0.739
Week 96	0.99 (0.92; 1.12)	1.02 (0.92 ; 1.11)	0.904
Median change	−0.01 (−0.03; 0.03)	−0.01 (−0.03; 0.03)	0.766
P (repeated measures)	0.953	0.577	

Change in lumbar spine BMD categories

In responders (N=102) and non-responders (N=58)



SVR N=102

Lumbar spine	Baseline n (%)	96 wk n (%)	*P*
Normal	52 (51.0)	50 (49.0)	0.846
Osteopenia	29 (28.4)	31 (30.4)	
Osteoporosis	21 (20.6)	21 (20.6)	

Non-SVR N=58

Lumbar spine	Baseline n (%)	96 wk n (%)	*P*
Normal	27 (46.6)	24 (41.4)	0.091
Osteopenia	21 (36.2)	27 (46.6)	
Osteoporosis	10 (17.2)	7 (12.1)	

- Osteoporosis. T score ≤−2.5 SD
- Osteopenia. T score between −1 and −2.5 SD.
- Cirrhosis. LS >12.5 kPa

Conclusions

1. We found that, in the medium term, eradication of HCV following anti-HCV therapy was not associated with significant changes in BMD in HIV/HCV-coinfected persons.
2. These findings do not support a causal association between HCV infection and reduced BMD in HIV/HCV-coinfected persons.

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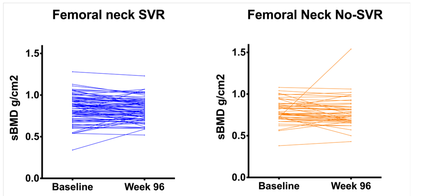
- JB is an investigator from the Programa de Intensificación de la Actividad Investigadora en el Sistema Nacional de Salud (I3SNS), Refs INT15/00079 and INT16/00100.

Characteristics of the Study Population

Characteristic	No SVR (n=58)	SVR (n=102)	*P*	Total (N=160)
Male sex, No. (%)	41 (70.7)	78 (76.5)	0.421	119 (74.4)
Age, y, median (IQR) (baseline)	49.3 (46.8 - 52.6)	49.7 (46.3 - 53)	0.949	49.6 (46.6 - 52.8)
BMI (m²/kg), median (IQR)	23.8 (22.1 - 25.1)	24.4 (21.4 - 27.2)	0.281	23.9 (21.6 - 26.3)
Prior injection drug use, No. (%)	44 (75.9)	74 (72.5)	0.647	118 (73.8)
Methadone therapy, No. (%)	7 (12.1)	11 (10.8)	0.889	18 (11.3)
Current alcohol intake > 50 g/d, No. (%)	1 (1.7)	3 (2.9)	0.393	4 (2.5)
Diabetes mellitus	3 (5.2)	9 (8.8)	0.399	12 (7.5)
Current smoking	39 (67.2)	70 (68.6)	0.704	109 (68.1)
Arterial hypertension	10 (17.2)	13 (12.7)	0.436	23 (14.4)
CDC disease category C, No. (%)*	20 (34.5)	25 (24.5)	0.403	45 (28.1)
CD4+, nadir, cells/mm³, median (IQR)	144 (68 - 251)	153 (90 - 234)	0.938	153 (83 - 246)
cART during anti-HCV treatment, No. (%)	57 (98.3)	101 (99)	0.684	158 (98.8)
CD4+, baseline, cells/mm³, median (IQR)	549 (352 - 756)	518 (348 - 762)	0.623	524 (348 - 762)
Undetectable HIV RNA load at baseline, No. (%)	49 (84.5)	92 (90.2)	0.283	141 (88.1)
Prior anti-HCV therapy, No. (%)	6 (10.3)	10 (9.8)	0.913	16 (10)
HCV genotype, No. (%)				
1	31 (53.4)	66 (64.7)	0.664	97 (60.6)
2	1 (1.7)	2 (2)		3 (1.9)
3	14 (24.1)	17 (16.7)		31 (19.4)
4	7 (12.1)	7 (6.9)		14 (8.8)
Other/mixed	5 (8.6)	9 (8.8)		14 (8.8)
Unknown	0 (0)	1 (1)		1 (0.6)
HCV-RNA, Log_{10} IU/mL, median (IQR)	6.64 (6.13 - 6.97)	6.23 (5.74 - 6.63)	0.001	6.35 (5.88 - 6.74)
HBsAg positivity, No. (%)	2 (3.4)	3 (2.9)	0.280	5 (3.1)
Liver cirrhosis, No. (%) (METAVIR 4 or TE>12.5)	23 (39.7)	51 (50)	0.207	74 (46.3)
Anti-HCV therapy			0.019	
Peg-IFN + RBV	19 (32.8)	37 (36.3)		56 (35)
Peg-IFN + RBV + HCV protease inhibitor	19 (32.8)	52 (51)		71 (44.4)
Peg-IFN + RBV + daclatasvir	6 (10.3)	7 (6.9)		13 (8.1)
Sofosbuvir + RBV	14 (24.1)	6 (5.9)		20 (12.5)

Changes in femoral neck sBMD

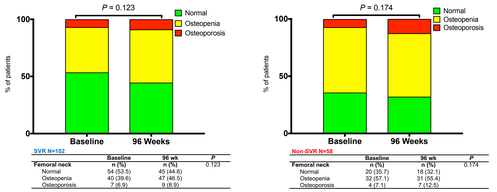
Results from patients with paired DXA studies



Variable – median (IQR)	SVR	Non-SVR	*P*
sBMD – g/cm²	N=50	N=82	
Baseline	0.78 (0.72; 0.87)	0.85 (0.75; 0.94)	0.061
Week 96	0.74 (0.68; 0.85)	0.81 (0.72; 0.91)	0.030
Median change	−0.02 (−0.05; 0.02)	−0.02 (−0.06; 0.01)	0.972
P (repeated measures)	0.011	0.001	

Change in femoral neck BMD categories

In responders (N=102) and non-responders (N=58)



SVR N=102

Femoral neck	Baseline n (%)	96 wk n (%)	*P*
Normal	54 (53.5)	45 (44.6)	0.123
Osteopenia	40 (39.6)	47 (46.5)	
Osteoporosis	7 (6.9)	9 (8.9)	

Non-SVR N=58

Femoral neck	Baseline n (%)	96 wk n (%)	*P*
Normal	20 (35.7)	18 (32.1)	0.174
Osteopenia	32 (57.1)	31 (55.4)	
Osteoporosis	4 (7.1)	7 (12.5)	

- Osteoporosis. T score ≤−2.5 SD
- Osteopenia. T score between −1 and −2.5 SD.
- Cirrhosis. LS >12.5 kPa

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