

BONE MINERAL DENSITY AFTER STRENGTH TRAINING IN HEMODIALYSIS PATIENTS

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INTRODUCTION

In chronic kidney disease (CKD) patients, bone quality and quantity can deteriorate rapidly due to several factors, resulting in increased bone fractures in these patients. Although the benefits of exercise are increasingly recognized in CKD patients, there are no studies regarding the effects a resistance exercise training program on bone markers in these patients.

OBJECTIVES

The aim of this study was evaluate the effects of resistance exercise on bone mineral density (BMD) and plasma bone markers in hemodialysis (HD) patients.

METHODS

This controlled study consisting of a 28 HD patients (66.7% men, 47.6 ± 11.1 years, 39.0 (19.2, 60.0) months of HD) assigned to either an exercise group (EG- N=14) or a control group (CG- N=14). Patients in the exercise group performed resistance exercise program (with elastic bands and leggings with both lower limbs) monitored 3 times per week (72 sessions), while the control group received standard care. Plasma bone markers (osteoprotegerin –OPG, osteocalcin –OC, Osteopontin-OPN and intact parathyroid hormone -iPTH) were measured by Luminex assay. Bone mineral density (BMD) was assessed by X-ray absorptiometry (DXA) before and after exercise period. assessed by DXA before and after 6 months.

RESULTS

Table 1. Biochemical parameters and BMD sites assessed of HD patients before and after RE

BMD sites (g/cm ²)	Exercise Group (n=14)		Control Group (n=14)	
	Before	After	Before	After
Femoral neck	0.89 ± 0.1	0.91 ± 0.1	0.86 ± 0.1	0.84 ± 0.1*
Total fêmur	0.96 ± 0.1	0.97 ± 0.1*	0.90 ± 0.1	0.88 ± 0.2*
Femoral trochanter	0.76 ± 0.1	0.77 ± 0.1*	0.71 ± 0.2	0.70 ± 0.2
Lumbar spine	1.11 ± 0.1	1.12 ± 0.1	1.04 ± 0.2	1.04 ± 0.2
Total body	1.10 ± 0.1	1.09 ± 0.1	1.03 ± 0.1	1.02 ± 0.2

*P<0.05

OPG increased significantly in EG patients (6.8 ± 1.8 ng/L vs 7.8 ± 1.8, p=0.02). Comparing groups, total femur and trochanter BMD improved significantly (p=0.016 and p= 0.038) in EG after intervention whereas there was a significant reduction in femoral neck and total femur density in CG (Table 1).

CONCLUSION

In conclusion, osteogenic stimuli may be triggered by exercise and have a favorable impact on bone density of HD patients.

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