The effects of denosumab treatment on bone mineral density, structural damage in patients with osteoporosis and rheumatoid arthritis P3

P. Dydykina, E. Petrova, I. Dydykina, A. Smirnov, S.Glukhova, E. Nasonov

V.A.Nasonova' Research Institute of Rheumatology, Russian Federation, Moscow

Objective(s)

RANK-ligand is essential for osteoclast development, activation, and survival. The aim of this study was to evaluate the effects of denosumab (monoclonal antibody that binds RANKL) on BMD, structural damage in patients with rheumatoid arthritis (RA) and osteoporosis (OP).

Materials and Methods

29 postmenopausal women with RA and OP received s/c denosumab 60 mg injections every 6 months for 12 months. The primary end point was the change from baseline in the Sharp/van der Heijde (SVH) score, X-ray morphometric analysis of deformations in vertebrae (Genant method) and BMD (by dual energy x-ray absorptiometry (DXA) at three sites: lumbar spine (L1-L4), hip neck (HN) and distal forearm (DF) at 12 months. The change of pain severity in spine (using VAS) also was assessed. The Statistica 6.0 was used in the statistical analysis.

Results

The mean age was 58,2±7,5 years, the mean duration of RA 19,8±12,0 years. During the study 18 patients (62,1%) continued glucocorticoids (GC). According to X-ray 9(31,0%) patients had the 2nd, 8(27,6%) – the 3rd and 12(41,4%) - the 4th stage of RA.

Mean BMD (L1-L4) before\after the treatment was 0,796 ± 0,088 g/cm² and 0,830 ± 0,088 g/cm² (p<0.001), at HN was 0,627 ± 0,077 g/cm² and 0,635 ± 0,079 g/cm² (p=0.156), at DF was 0,484 ± 0,100 g/cm² and 0,498 ± 0,092 g/cm² (p=0.032), respectively (Table 1).
The significant increase of BMD (L1-L4) was noted both in groups, receiving GC or not (Table 2).

Table 1. BMD dynamic after treatment (n=29)

DXA site	BMD (g/cm²) baseline, M±δ	BMD (g/cm²) after treatment, M±δ	p	Δ BMD after 12 months (%) M (min; max)
L1-L4	0,796 ± 0,088	0,830 ± 0,088	p<0.001	+4,3 (-4,6; +17,6)
Hip neck	0,627 ± 0,077	0,635 ± 0,079	p=0.156	+1,2 (-8,7; +9,4)
Forearm (distal 1/3)	0,484 ± 0,100	0,498 ± 0,092	p=0.032	+2,4 (-5,9; +30,4)

Table 2. BMD dynamic after treatment in groups (GC+/GC-).

	GC "+" (n=18)			GC "-" (n=11)		
DXA site	BMD (g/cm²) baseline, M±δ	BMD (g/cm²) after treatment, M±δ	p	BMD (g/cm²) baseline, M±δ	BMD (g/cm²) after treatment, M±δ	p
L1-L4	0,785 ± 0,087	0,823 ± 0,088	p=0.001	0,816± 0,091	0,840 ± 0,092	p=0.006
Hip neck	0,598 ± 0,064	0,605 ± 0,067	p=0.313	0,672 ± 0,076	0,681 ± 0,075	p=0.476
Forearm (distal 1/3)	0,480 ± 0,113	0,493 ± 0,105	p=0.027	0,484 ± 0,068	0,506 ± 0,071	p=0.109

The erosion score and total SVH score were increased after treatment (p=0.043): 53.3 ± 53.7 and 54.3 ± 53.8, 156.1 ± 84.7 and 157.3 ± 85.0, respectively. **The amount of narrowed cracks** did not change significant: 102.7 ± 37.1 and 103.0 ± 37.1 (Table 3).

Table 3. The dynamic of SVH score.

GC "+"	M	Me	25%	75%	δ	p
Erosion score baseline	53,3	33,0	11,0	78,0	53,7	
Erosion score after treatment	54,3	34,0	11,0	90,0	53,8	P=0.043
JSN score baseline	102,7	111,0	81,0	131,0	37,1	
JSN score after treatment	103,0	111,0	81,0	131,0	37,1	P=0.179
Total SVH score baseline	156,1	147,0	85,0	221,0	84,7	
Total SVH score after treatment	157,3	153,0	85,0	221,0	85,0	P=0.043

The index of vertebral deformations at lumbar site of spine did not change after treatment - 0,79 ± 0,03, at thoracic site was 0,77 ± 0,04 and 0,76 ± 0,04 (p>0,05), respectively.
At baseline 13(44,8%) patients had **pain in thoracic site of spine** and after treatment - 5(17,2%) (mean VAS 41.1 ± 16.9 and 36.0 ± 11.0 mm, respectively), **at lumbar site** in 17(58,6%) and 6(20,7%) (46.7 ± 22.9 and 36.6 ± 3.53 mm, respectively).

Conclusions

After 12 months of therapy with denosumab it was shown the significant increase of BMD in (L1-L4) and forearm. The erosion score and total SVH score were increased after treatment The index of vertebral deformations remained stable. The frequency and severity of spine pain were decreased.