

# COMPARATIVE EFFECTIVENESS OF BIPHOSPHONATES AND PARATHYROIDECTOMY IN OSTEOPOROSIS RELATED TO PRIMARY HYPERPARATHYROIDISM

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## INTRODUCTION

The use of Bisphosphonates could be a treatment option of Osteoporosis secondary to Primary Hyperparathyroidism (OPHP) in patients not eligible or that refuse/reject surgery.

## METHODS/DESIGN

We analyzed data of 46 patients diagnosed of OPHP. Fourteen underwent surgery and 32 were treated with Bisphosphonates at standard dose. Densitometric parameters and of calcium-phosphorus metabolism were analyzed before and after 1 and 2 years of treatment. The analysis was performed with SPSS-20.0.

## RESULTS

**Table 1. Baseline characteristics of patients with primary hyperparathyroidism**

	Bisphosphonates treatment group	Surgery treatment group	P <sup>a</sup> value
N	32	14	
Age (years)	65±8	61±11	0,178
Body mass index (kg/m <sup>2</sup> )	26.2±4.9	25.0±4.4	0,441
Menopause age (years)	47±6	50±6	0,192
Years since menopause	18±9	13±9	0,159
Smoking habit (≥10 cigarettes per day)	8 (57.1)	4 (12.9)	<b>0,002</b>
Alcohol consumption (≥3 units per day)	0	1 (2.3%)	0,295
Consumption of calcium (≥3 glasses of milk or equivalent)	7 (87.5)	19 (73.1)	0,645
Creatinine clearance	81±30	88±31	0,526
Previous low trauma fracture	9 (28.1)	1 (7.1)	0,112
Vitamine D	22.4 (12.5-28.3)	16.1 (8.5-23.75)	0.203

Data as N (%), Mean±Standard Deviation or Median (Interquartile Range). Significance of differences among pairs of groups if p < 0.05.

There were not differences in age, BMI, menopause age, years since menopause, alcohol consumption, diagnosis of previous low-trauma fracture, calcium intake, creatinine clearance, serum PTH, urinary calcium, serum alkaline phosphatase, urinary D-pyridinoline, vitamine D; neither in the mineral density (MD) of Lumbar spine, femoral neck or total hip at baseline between groups. Smoking was more frequent and serum calcium lower in the bisphosphonate group (BG) (p<0,05). **(Table 1)** Serum calcium and PTH decreased after 1 and 2 years of treatment within surgery group (SG)(p<0,01) but remained stable in the BG. Urinary calcium decreased in the SG, urine D-pyridinoline decreased in the BG and Serum alkaline phosphatase decreased in both groups after 1 and 2 years. There were no differences between groups. **(Table 2)** The lumbar spine mineral density (MD) increased after 1 year (0.754±0.121 vs 0.785±0.132; p<0,01) and 2 years (0.754±0.121 vs 0.791±0.107; p<0.01) in the BG, and only after 2 years (0.749±0.144 vs 0.794±0.189; p<0,05) in the SG. Femoral neck MD increased after 1 year (0.622±0.091 vs 0.640±0.093; p<0,01) but remained stable after 2 years in the BG. It also remained stable in the SG and in total hip MD in both groups. No differences were found between groups in MD in any location. **(Table 3)**

**Table 2. Mineral metabolism and resorptive parameter changes in patients with primary hyperparathyroidism after medical or surgical treatment**

	Years of treatment	Bisphosphonates treatment group	Surgery treatment group	P <sup>a</sup> value
Serum calcium (mg/dl)	Baseline	10.2±0.7	10.8±0.9	<b>0.028*</b>
	1-year	10.1±0.7	9.6±0.4**	<b>0.011*</b>
	2-years	10.2±0.6	9.5±0.4**	<b>0.001**</b>
Serum PTH (ng/l)	Baseline	121.0±35.2	141.3±68.9	0,324
	1-year	111.4±47.1	68.8±26.5**	<b>0.050*</b>
	2-years	120.1±59.1	57.5±34.0**	<b>0.001**</b>
Urine calcium (mg/dl)	Baseline	12.6 (7.2-18.2)	16.6 (7.4-25.6)	0,346
	1-year	11.9 (8.1-15.8)	9.7 (5.8-13.0)*	0,297
	2-years	11.8 (8.7-17.8)	10.4 (5.7-18.6)*	0,666
Serum alkaline phosphatase	Baseline	110.0 (71.8-181.4)	98.9 (71.8-130.0)	0,531
	1-year	67.0 (55.8-94.2)**	74.0 (64.0-88.0)**	0,546
	2-years	69.5 (57.0-88.8)**	70.0 (57.5-91.0)**	0,844
Urine D-pyridinoline	Baseline	8.9 (6.8-12.3)	8.0 (6.4-10.2)	0,589
	1-year	7.2 (5.4-8.1)**	6.5 (4.6-7.4)	0,355
	2-years	5.9 (4.5-7.1)**	6.9 (3.5-9.2)	0,507

Data as N (%). Mean±Standard Deviation or Median (Interquartile Range). \*, P< 0.050; \*\*, P< 0.010 by comparison to baseline. <sup>a</sup>Significance of differences among pairs of groups if P< 0.05.

**Table 3. Bone mineral density changes in patients with primary hyperparathyroidism after medical or surgical treatment**

	Years of treatment	Bisphosphonates treatment group	Surgery treatment group	P <sup>a</sup> value
Lumbar spine mineral density (g/cm <sup>2</sup> )	Baseline	0.754±0.121	0.749±0.144	0,899
	1-year	0.785±0.132**	0.797±0.179	0,827
	2-years	0.791±0.107**	0.794±0.189*	0,955
Lumbar spine T score (SD)	Baseline	-3.04±1.09	-2.99±1.34	0,905
	1-year	-2.68±1.08**	-2.67±1.48	0,982
	2-years	-2.62±1.00**	-2.51±1.71*	0,809
Femoral neck mineral density (g/cm <sup>2</sup> )	Baseline	0.622±0.091	0.606±0.088	0,588
	1-year	0.640±0.093**	0.599±0.107	0,262
	2-years	0.632±0.097	0.609±0.109	0,526
Femoral neck T score (SD)	Baseline	-2.58±0.97	-2.59±0.93	0,971
	1-year	-2.41±0.95**	-2.70±0.95	0,415
	2-years	-2.46±1.05	-2.69±1.08	0,546
Total hip mineral density (g/cm <sup>2</sup> )	Baseline	0.737±0.105	0.672±0.165	0,323
	1-year	0.752±0.104	0.670±0.149	0,083
	2-years	0.706±0.132	0.702±0.139	0,929
Total hip T score (SD)	Baseline	-1.50 (2.70-1.10)	-1.55 (4.20-1.20)	0,524
	1-year	-1.90 (2.4-1.2)	-1.90 (3.5-1.3)	0,407
	2-years	-2.00 (2.68-1.48)	-2.00 (2.93-1.43)	0,605

Data as Mean±Standard Deviation or Median (Interquartile Range). \*, P< 0.050; \*\*, P<0.010 by comparison to baseline. <sup>a</sup>Significance of differences among pairs of groups if P< 0.05.

## CONCLUSIONS

Bisphosphonates treatment could be as effective as parathyroidectomy in the treatment of OPHP



## References

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