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## BACKGROUND

➤ Major factor that modulates the parathyroid hormone (PTH) secretion is serum calcium (Ca) level. Parathyroid gland also receives direct autonomic innervation.

➤ To date, measurement of several hormones such as cortisol, prolactin, renin and aldosteron were found to be affected by changing the posture from recumbent to the upright position

➤ In the present study, we aimed to investigate postural change of PTH in normal individuals and patients with primary hyperparathyroidism (PHPT).

## MATERIALS AND METHODS

➤ 23 patients with PHPT and 9 age healthy controls were enrolled in our study.

➤ Blood samples were taken from all individuals after 12 hours of fasting. Following replacement of an intravenous catheter, the patients were requested to rest in bed in recumbent position but not sleeping for an hour and blood samples were obtained for PTH and Ca measurements at the 45 th and 60 th minutes of resting. Afterwards, the patients changed the posture to the upright position and stood up for an hour and again blood samples were obtained at the 45 th and 60 th minutes of standing. Pulses and blood pressures of all individuals were recorded in both postures

## RESULTS

➤ In the group of patients with PHPT, mean serum PTH was measured as 75.36 pg/ml which is higher during upright position compared to recumbent position and the difference was statistically significant.

➤ In the control group mean serum PTH was measured only 3.09 pg/ml higher during the upright position compared to recumbent position and the difference didn't reach statistical significance.

➤ In both groups, Ca was higher when the patient was in the upright position compared to the recumbent position

**Table 1.** Comparisons of 45 th and 60 th minutes measurements of Ca and PTH within the control and the patient groups

Variables	45 th min	60 th min	p-value
<b>PTH Recumbent</b>			
Control Group	42.2 (14.2-56.0)	43.6 (14.3-57.1)	0.314
Case Group	151.5 (31.0-932.0)	154.9 (31.3-926.0)	0.242
<b>PTH Upright</b>			
Control Group	45.9 (17.5-69.3)	38,0 (16,5-73,0)	0.374
Patient Group	206.5 (56.4-1161.0)	206,1 (54,1-1218.0)	0.256
<b>Ca Recumbent</b>			
Control Group	9.04±0.31	9.10±0.31	<b>0.014</b>
Patient Group	10.92±0.94	10.77±0.34	0.429
<b>Ca Upright</b>			
Control Group	9.51±0.37	9.56±0.30	0.400
Case Group	11.44±1.01	11.54±1.12	0.183

**Table 2.** Other clinical parameters of the control and the patient groups

Variables	Control Group	Patient Group	p-value
Delta PTH	1.7 (-4,4 – 14,6)	47.7 (5.9 – 289,3)	<b>&lt;0,001</b>
Delta Ca	0.46±0.10	0.65±0.28	0,065
PTH change(%)	3.5 (-9.6 – 31.6)	33.3 (6.8 – 93.7)	<b>&lt;0,001</b>
Ca change (%)	5.4 (3.1 – 6.7)	5.7 (1.4 – 18.9)	0.334

## CONCLUSION

➤ It was reported that total calcium measurement increases in upright posture which should normally decrease the measured PTH level.

➤ However PTH secretion is autonomic in PHPT and increased in upright position regardless of serum Ca level.