

# Study of Primary Hyperparathyroidism

Parmar Girish, M. Lala, M. Chadha, N. F. Shah, P. H. Chauhan

P.D. Hinduja National Hospital and Medical Research Centre, Veer Savarkar Marg, Mahim, Mumbai – 400 016, India

### ABSTRACT

**Introduction:** The clinical spectrum of primary hyperparathyroidism (PHPT) has undergone a striking change with asymptomatic form predominant in developed countries, whereas symptomatic form predominant in developing countries. In this study, we have analyzed clinical presentation, investigations, management, operative findings in patients with PHPT at our center. **Materials and Method:** A retrospective, review of medical records of all patients with PHPT between 2000 and July 2012 at our institute was undertaken. A total of 96 patients were included in this study. **Results:** The mean age of patients was 50.8 years. Of the 96 patients, 63 were females (65.6%) and 33 were males (34.4%). Among them, 17.7% were asymptomatic and 82.3% were symptomatic. Bone pain was the most common complaint (52%) followed by renal stones (27%). Nearly 10.4% were part of familial PHPT, whereas others were sporadic adenomas. All patients had hypercalcemia (range 10.5–19.4 mg/dl) with elevated parathyroid (PTH) levels (range 32–3820 pg/ml). 25(OH) VitD levels were available in 86 patients (89.6%). There was no correlation between VitaminD levels and symptomatology. Sestamibi scan was true positive in 95.6%, false negative 2.2%, and inconclusive in 2.2%. Ultrasonography (USG) results were true positive in 84.2%, false positive in 6.3%, and false negative in 9.5%. Intraoperative PTH levels were measured in 83.3% patients. Postoperative complications were reported in 20.8% patients. **Conclusions:** Clinical spectrum of PHPT varies but bones and stones are still the predominant manifestations even in affluent society. Asymptomatic form also exists and can be detected by routine measurement of serum calcium. There was no correlation seen between the 25 VitD levels and clinical symptoms.

**Key words:** Primary hyperparathyroidism, sestamibi scan, ultrasonography parathyroid

## INTRODUCTION

The clinical spectrum of primary hyperparathyroidism (PHPT) has undergone a striking change with asymptomatic form being predominant in developed countries whereas symptomatic form being predominant in developing countries.<sup>[1]</sup> Our center is a tertiary care, private hospital situated in Mumbai where serum calcium analysis is included in the routine biochemical evaluation. In this study, we have analyzed clinical presentation, investigations, management, operative findings, and immediate postoperative course of patients with PHPT at our center.

## MATERIALS AND METHODS

A retrospective, review of medical records of all patients with PHPT between July 2000 and July 2012 at our institute was undertaken. A total of 96 patients had undergone surgery for PHPT during this period. The diagnosis of PHPT was based on the following criteria: (1) persistent elevation of serum calcium above the upper limit of normal; (2) normal or increased circulating immunoreactive intact PTH; and (3) histological evidence of parathyroid adenoma or hyperplasia. Serum calcium and phosphorus levels were measured by Ion-specific electrode and phosphomolybdate UV method, respectively. Serum intact PTH levels were measured by solid phase, two site chemiluminescent enzyme labeled immunometric assay (Immulite, Seimens). 25(OH) VitD levels were measured using Radioimmunoassay (Diasorin, Minnesota). 25(OH) VitD deficiency was defined as level less than 20 ng/ml and insufficiency as level between 20 and 30 ng/ml. 25(OH) VitD sufficiency was defined as levels more than 30 ng/ml. Intraoperative intact PTH level was measured at 10 minutes by the same assay

#### Access this article online

##### Quick Response Code:



**Website:**  
www.ijem.in

**DOI:**  
10.4103/2230-8210.104114

**Corresponding Author:** Dr. Parmar Girish, Department of Endocrinology, P.D. Hinduja National Hospital and Medical Research Centre, Veer Savarkar Marg, Mahim, Mumbai – 400 016, India. E-mail: drgirish21@yahoo.co.in

in some cases and the result was available after 2 hours. The institutional review board at our institution approved this study protocol.

## RESULTS

The mean age of patients was 50.8 years (range 11–85 years). Of the 96 patients, 63 were females (65.6%) and 33 were males (34.4%). Among them, 17 patients (17.7%) were asymptomatic, whereas 79 (82.3%) were symptomatic. Bone pain was the most common complaint (52%) followed by renal stones (27%). The other manifestations were proximal muscle weakness (17%), dyspepsia (16%), constipation (10%), altered sensorium (9%), pancreatitis (8%). Infrequent symptoms in the form of body pain, seizures, weakness, and abdomen pain were seen in 1–2% of patients. A total of 40 patients (42%) had associated hypertension and 12 patients (12.5%) had documented osteoporosis. Bone mineral density was not available for all patients.

Among the 96 patients, 10 (10.4%) were part of familial PHPT having Multiple endocrine neoplasia (MEN) syndrome, whereas others were sporadic adenomas. All patients had documented hypercalcemia (range 10.5–19.4 mg/dl). PTH levels ranged from 32 to 3820 pg/ml. 25(OH) VitD levels were available in 86 patients (89.6%). A total of 50 (58%) had VitD deficiency, 20 (23.3%) had VitD insufficiency, and 16 (18.6%) had normal VitD levels. The mean  $\pm$  SD of 25(OH) VitD levels was  $20.98 \pm 17.8$  ng/ml. Preoperative localization was done with Sestamibi scan in 91 of the 96 patients (94.8%). Sestamibi scan was true positive in 95.6%, false negative 2.2%, and inconclusive in 2.2%. Ultrasonography (USG) details were available of 63 patients (65.6%). USG results were true positive in 84.2%, false positive in 6.3%, and false negative 9.5%.

Right inferior parathyroid gland was involved gland in 34 patients (35.4%), left inferior in 33 (34.4%), right superior in 12 (12.5%), and left superior in 7 (7.3%). Rest of the patients had double adenoma or hyperplasia. Intraoperative PTH levels were measured in 83.3% of patients. Postoperative complications were reported in only 20 of 96 patients (20.8%). Eleven patients had asymptomatic hypocalcemia, whereas nine patients had symptomatic hypocalcemia.

## DISCUSSION

In our study 18% of patients were diagnosed to have asymptomatic PHPT. Out of the 96 patients, 7 (7.3%) were diagnosed during routine health check program. Bone disease was the most common mode of presentation

seen in 53% patients followed by renal stones 26%. This is lower than previously reported from India.<sup>[2]</sup> In a review of Indian studies, bone disease was reported in 77% and renal disease in 36% patients.<sup>[3]</sup> These differences may be due to the different patient profile (affluent society) seen at our center, whereas most Indian studies are from public hospitals catering to lower-middle socio-economic population. The PTH levels were higher than those reported from USA but lower than those reported from Indian studies.<sup>[3]</sup> The mean PTH level was  $572 \pm 637$  pg/ml. Nearly 58% patients had VitD deficiency, 23.3% patients had VitD insufficiency, and 18.6% had normal VitD levels. This is similar to studies from India as compared with higher VitD levels reported from USA. Thus, our study cohort had features midway between those reported from the Western countries and those reported from India. There is a trend toward early detection of PHPT in the asymptomatic form especially in the affluent population from west India.

Comparing the asymptomatic and symptomatic groups, there was no difference in the age at presentation. The mean corrected calcium level in the asymptomatic group was significantly lower than the symptomatic group (mean  $\pm$  SD:  $11.74 \pm 1.1$  mg/dl vs  $12.63 \pm 1.76$  mg/dl;  $P = 0.03$ ). The mean PTH level was significantly lower in the asymptomatic group as compared with the symptomatic group (mean  $\pm$  SD:  $333 \pm 293$  pg/ml vs  $624 \pm 679$  pg/ml;  $P 0.037$ ). However, 25(OH) VitD levels were not significantly different between the two groups (mean  $\pm$  SD:  $21.4 \pm 11.6$  ng/ml vs  $20.9 \pm 18.9$  ng/ml). It is speculated that Indian patients are more symptomatic due to the widely prevalent hypovitaminosis D. However, in the symptomatic group, there was no correlation between VitaminD levels and symptoms. Moreover, there was no correlation between VitaminD levels and PTH levels. Lack of correlation between VitaminD levels and symptoms may be because most symptoms of PHPT are vague and nonspecific. In addition, it is the duration of the disease and not the severity of laboratory abnormalities that mediate symptoms of PHPT.<sup>[4]</sup> In addition, it may be possible that these patients from affluent society may have received VitaminD supplementation prior to hospitalization.

## CONCLUSIONS

Clinical spectrum of PHPT varies but bones and stones are still the predominant manifestations even in affluent society. Asymptomatic form also exists and can be detected by routine measurement of serum calcium. There was no correlation seen between the 25 VitD levels and clinical symptoms.

## REFERENCES

1. Bilezikian JP, Khan AA, Potts JT Jr. Guidelines for the management of asymptomatic primary hyperparathyroidism: Summary statement from the third international workshop. *J Clin Endocrinol Metab* 2009;94:335-9.
2. Mishra SK, Agarwal G, Kar DK, Gupta SK, Mithal A, Rastad J. Unique clinical characteristics of primary hyperparathyroidism in India. *Br J Surg* 2001;88:708-14.
3. Pradeep PV, Jayashree B, Mishra A, Mishra SK. Systematic review of primary hyperparathyroidism in India: the past, present, and the future trends. *Int J Endocrinol* 2011;2011:921814.
4. Bargren AE, Repplinger D, Chen H, Sippel RS. Can biochemical abnormalities predict symptomatology in patients with primary hyperparathyroidism? *J Am Coll Surg* 2011;213:410-4.

**Cite this article as:** Girish P, Lala M, Chadha M, Shah NF, Chauhan PH. Study of Primary Hyperparathyroidism. *Indian J Endocr Metab* 2012;16:S418-20.

**Source of Support:** Nil, **Conflict of Interest:** None