Primary Hyperparathyroidism - Scenario in North Coastal Andhra Pradesh

Kalisetty Suresh Babu¹, Suvarapu Jahnavi², Nivetha Kandan³, Vadisetti Satya Niharika⁴

¹Assistant Professor, Department of General Surgery, King George Hospital, Andhra Pradesh. ²Postgraduate, Department of General Surgery, Andhra Medical College, Andhra Pradesh. ³Postgraduate, Department of General Surgery, Andhra Medical College, Andhra Pradesh. ⁴Postgraduate, Department of General Surgery, Andhra Medical College, Andhra Pradesh.

ABSTRACT

BACKGROUND
Primary hyperparathyroidism is a common disorder occurring in 0.1-0.3% of the general population. It continues to be associated with significant morbidity because of its varied presentation and delay in the diagnosis and management. Our experience in a tertiary care hospital has been reviewed to establish the various modes of presentation, the age distribution, the cause of primary hyperparathyroidism using most accurate and efficient means to establish the diagnosis and the appropriate operative procedure for the disorder.

METHODS
This is a retrospective descriptive study conducted for a period of three years from January 2015 to December 2017 on a total of 14 patients with primary hyperparathyroidism, who were admitted in the Department of Surgery, Andhra Medical College, King George Hospital, Visakhapatnam. All the cases were studied based on demography, clinical presentation, radiological evaluation, and biochemical parameters along with histopathological examination.

RESULTS
Primary Hyperparathyroidism was very common in the age group of 30-40 years. The incidence of this disease showed a female predominance accounting for approximately 78.6% of the cases in our study. Hypercalcemia and elevated levels of parathyroid hormones were universal in all the cases. Solitary Parathyroid Adenoma was the cause of Primary Hyperparathyroidism in 100% of the cases. Multiple glandular involvement was not observed in our study. All the patients with Primary Hyperparathyroidism due to solitary parathyroid adenoma were managed surgically with solitary parathyroidectomy.

CONCLUSIONS
Primary Hyperparathyroidism is not an uncommon disorder. Varied presentation of the disease results in difficulty in early diagnosis. However, a high index of suspicion and availability of advanced localising investigations have made the diagnosis of this disorder easier in the recent past. Parathyroidectomy can be accomplished with >95% success rates with minimal morbidity and is the only curative treatment option for PHPT.

KEYWORDS
Primary Hyperparathyroidism, Parathyroid Adenoma, Parathyroidectomy, Serum PTH Levels, Hypercalcemia
Primary hyperparathyroidism (PHPT) is a disease characterized by hyperactivity of one or more parathyroid glands, disordered calcium homeostasis and a consequent increase in serum calcium levels with elevated or inappropriately present circulating levels of parathyroid hormone (PTH). It is due to autonomous production of parathyroid hormone (PTH) and is present in 1% of the adult population with a prevalence of 1-4 per 1000 persons. The diagnosis of PHPT was made much more commonly after the advent of multichannel analyser measuring serum calcium concentration by mild hypercalcemia, lack of any specific symptomatology, or obvious renal or bone disease. Currently, up to 80% of patients with PHPT, where biochemical screening is routine have “asymptomatic” PHPT.

The purpose of this study is to highlight the clinical presentation, age and sex distribution, pre-operative localisation, management of primary hyperparathyroidism due to parathyroid adenoma and to study the post-operative histopathology specimens.

METHODS

This is a retrospective descriptive study conducted for a period of three years from January 2015 to December 2017 on a total of 14 patients with primary hyperparathyroidism, who were admitted in the Department of Surgery, Andhra Medical College, King George Hospital, Visakhapatnam. All the cases were studied based on demographic, clinical presentation, radiological evaluation, biochemical parameters along with histopathological examination. Data was collected from inpatient department. Data includes gender, age, type of symptoms, the operative diagnosis and surgical procedure. The results of biochemical values, ultrasonography of the neck, CT scan of the neck and Sestamibi scan reports were taken into consideration.

RESULTS

Of the 14 cases of Primary Hyperparathyroidism that were studied the mean age of presentation was 41.2 years (range from 28-58) with majority of the patients being females who were 11 (78.6%) and the remaining 3 were males (21.4%). 10 patients were under the age of 40 years. Highest incidence was in the age group 30-40 years (6 cases; 42.85%) followed by 20-30 years age group (4 cases; 28.57%), 40-50 years age group (3 cases; 21.42%) and only 1 case (7.1%) in the age group of 50-60 years.

<table>
<thead>
<tr>
<th>Clinical Features</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimally symptomatic with weakness, anaemia, easy fatigability, lassitude, anxiety and peptic ulcer disease</td>
<td>6</td>
</tr>
<tr>
<td>Bone pains</td>
<td>4</td>
</tr>
<tr>
<td>Pathological fracture</td>
<td>1</td>
</tr>
<tr>
<td>Renal stones</td>
<td>2</td>
</tr>
<tr>
<td>Depression with psychotic features</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 1. Sex Distribution

Figure 2. Age Distribution

Table 1

Figure 3

Figure 4. PTH Levels

Figure 5. Calcium Levels
All the cases had elevated PTH with persistent hypercalcemia. All the cases underwent ultrasound neck along with Sestamibi (Tc99m) scintigraphy which showed disease of right inferior glands in 11 cases and left inferior gland in 3 cases. All the 14 patients underwent Parathyroidectomy after localisation of diseased gland. Postoperative pathology revealed parathyroid adenoma consisting of main and oxyphil cells.

DISCUSSION

Primary hyperparathyroidism (PHPT) is the most common cause of hypercalcemia, the treatment of which is primarily surgical resection. A single benign adenoma is seen in 80% of the cases. A smaller percentage about 15% to 20% have multigland disease, including multiple adenomas and hyperplasia. Multiglandular disease is more common in familial syndromes such as multiple endocrine neoplasia (MEN) 1 or 2.\(^3\) Parathyroid carcinoma is rare, occurring in fewer than 1% of patients with PHPT. All cases in the study group were single gland adenomas. It is observed mainly in postmenopausal women (female-to-male ratio of 3:4: 1) over 50 years old.\(^4,5\) Studies in India have reported that PHPT patients are young with female predominance.\(^6,7,8\) Our study supports the demographic data of studies in India. The reason for the younger age of presentation is not known.

The signs and symptoms of hyperparathyroidism reflect the combined effects of increased parathyroid hormone secretion and hypercalcemia.\(^9\) Primary hyperparathyroidism has traditionally been associated with a constellation of symptoms including "painful bones, renal stones, abdominal groans, and psychic moans." This study revealed that in our center the number of PHPT patients who were asymptomatic at presentation were higher than those with a symptomatic disease like bone pain, fractures, renal stones. Bhansali et al.\(^10\) have observed figures from another premier institute in India where 67% had bone disease, 48% had fractures, 21% had stone disease, 23% had psychiatric symptoms and 15% had peptic ulcer in contrast to our study where majority of them were asymptomatic. Predominance of symptomatic disease has been reported by many other studies from India.\(^10,11\) This is in contrast to many developed countries where asymptomatic disease predominates as in our study. In a study from in Rochester, Minnesota, USA, the increasing incidence of PHPT due to routine screening, was largely due to increasing estimation of serum calcium.\(^12,13\)

The reasons for symptomatic disease in India could be the lack of awareness of the disease at primary care physician level, availability of autoanalyzer limited to the secondary and tertiary health centers and absence of routine annual physical examinations.

Trend of diagnosing PHPT changed from the classical symptoms to underrecognized symptoms like gallstones and pancreatitis in the last five years but no such evidence of presentation was noted in our study. The diagnosis of PHPT is very straightforward after confirmation of persistent hypercalcemia. The total serum calcium must be adjusted for albumin. For every gram-per-decilitre reduction in the serum albumin concentration, the total calcium measurement should be adjusted upwards by 0.8 mg/dL.

Diagnosis of PHPT was based on inappropriately elevated PTH despite elevated albumin adjusted calcium. In our study, both serum calcium and PTH level were elevated in all cases. All patients should undergo preoperative imaging tests before parathyroidectomy, in order to locate the affected gland(s). Imaging tests are not used for diagnostic purposes.\(^14\) There is, thus, no indication for parathyroid imaging if surgery is not planned. The most commonly used tests are ultrasound, sestamibi imaging, and CT.

Localization of the culprit gland was done by ultrasonography (USG) and confirmed by technetium (Tc99m) labelled Sestamibi scan in our study to increase sensitivity.\(^15\) The sensitivity of ultrasonography for the localization of abnormal parathyroid glands generally varies in the literature from 61% to 85% (8-11). The variation in these numbers could be due to the fact that ultrasonography is operator-dependent.\(^16\) In the study by Haber RS et al when ultrasound and sestamibi scans are used together, the sensitivity of preoperative localization of parathyroid adenomas increases. These findings are consistent with the majority of studies. The reported sensitivity ranges between 94% and 99%. Regardless of which technique is used, sestamibi scanning as a single modality for identifying adenomas has a reported sensitivity of 54%–100%, with most series in the 80% or 90% range.\(^17\) CT and MRI are less used but are useful in patients with failed parathyroidectomy or persistent PHPT to identify ectopic glands. The use of CT with four-dimensional techniques (4D-CT) provides greater anatomical resolution.\(^18\)

In the study by Shah VN et al, solitary parathyroid adenoma remained the most common cause of PHPT with left inferior glands being affected more frequently.\(^19\) In contrast, right inferior gland was most commonly involved in our study. Virtually all patients with a diagnosis of primary HPT should undergo surgical resection.\(^20\) The surgical gold standard is a bilateral neck exploration with identification of all four parathyroid glands and resection of the abnormal gland(s). This procedure has a success rate of approximately 97% for curing primary HPT, with complication rates of 1% to 2% when performed by experienced endocrine surgeons. Given that 80% to 85% of patients will have only a solitary adenoma, bilateral neck exploration subjects 15% to 20% of patients to unnecessarily extensive surgery, with the attendant risks of recurrent laryngeal nerve injury and postoperative hypocalcaemia. In our center, after confirmation of diagnosis and localisation of disease open solitary parathyroidectomy was performed.

CONCLUSIONS

In the present study, primary hyperparathyroidism due to single gland parathyroid adenoma was common in the middle age with female predominance. Asymptomatic presentation was the most common presentation followed by skeletal deformities, nephrolithiasis and neurological disorders. Serum calcium, parathyroid hormone, USG neck, neck sestamibi scan were the common investigations done. All of them were diagnosed as parathyroid adenoma in post-operative biopsy.
REFERENCES


