Primary Hyperparathyroidism

Overview

Primary hyperparathyroidism (PHPT) is characterized by elevated plasma levels of parathyroid hormone (PTH) and calcium with reduced plasma phosphate. PHPT is the third most frequently diagnosed endocrine disorder. It is a silent health problem in the elderly until it becomes apparent with cognitive and physical consequences, for example, mental status change, severe constipation, and fracture.

Risk factors for PHPT include:

- Post-menopausal state
- Prolonged severe calcium deficiency
- Prolonged severe vitamin D deficiency

Rare PHPT risk factors include:

- Inherited disorder, such as multiple endocrine neoplasia-type I (which usually affects multiple glands)
- Radiation exposure to head and neck regions
- Medications, such as lithium, a drug most often used to treat bipolar disorder.

Key Points

PHPT risk increases with age. It is often diagnosed in the 6th or 7th decade of life.

PHPT prevalence in the elderly is about 1 in every 100 older adults with a ratio of Women: men = 3-5: 1.

Most epidemiologic studies were conducted with Caucasians; there is a lack of ethnicity and race data to determine if ethnic variations exist but clinical experience suggests risk is present in all ethnic/racial groups.

Fifty percent of patients present with mental disturbance, for example, personality change, depression, or psychosis. They may also become frail presenting with sudden fast decline in health and functional abilities.

Diagnosis

Presenting symptoms may often be confused with other age related disease presentations, specifically in an older patient. Common presenting symptoms include fragility fracture (due to bone loss and osteoporosis), pain due to kidney stones, excessive urination, abdominal
pain, weakness, fatigue, depression or forgetfulness, bone and joint pain, frequent complaints of illness with no apparent cause, nausea, and vomiting or loss of appetite.

Asymptomatic PHPT is often diagnosed with incidental laboratory findings and may present as consistently normal calcium with persistently abnormal PTH in the absence of recognizable underlying cause of elevated PTH. Most patients become hypercalcemic at a later time.

After a complete history and physical examination, the following tests are recommended:

1. Serum calcium, phosphorus, magnesium, alkaline phosphatase, intact PTH, 25-OH vitamin D, urinary calcium and bone markers (resorption markers, e.g., urine NTX), serum creatinine and GFR (for kidney function).
2. When indicated based on signs and symptoms, a parathyroid nuclear medicine scan will confirm adenoma (85% patients with PHPT usually have single adenoma).

Management

PHPT complications may include osteoporosis, kidney stones, cardiovascular disease, hypertension, left ventricular hypertrophy, and carotid plaque thickness.

Surgical intervention is the main form of treatment. Surgery is indicated for treatment in elderly patients with serum calcium >1 mg/dl (0.25 mmol/L) above normal range, GFR <60 ml/min/1.73m2 and a T score <-2.5 SD at spine, hip (total or femoral neck) or radius (distal 1/3 site) or presence of fragility fracture.

Expected surgical outcomes include improved symptoms, increased bone mineral density (BMD), fewer renal stones, improved neurocognitive function. Availability of higher quality imaging advances efficacy and safety of surgical techniques. Out-patient minimally invasive surgery support treatment in the elderly.

Case Presentation

A 70 year old African-American man with a past medical history of hypertension, hyperlipidemia, COPD (a former smoker, currently on steroid inhaler), renal stones (no current symptoms) and recurrent abdominal pain (due to diverticulitis and chronic constipation for several years that he usually treats himself with OTC medication and lactulose as needed), was being seen in the outpatient clinic. His chief complaint was constipation with no bowel movement for past 5 days associated with abdominal discomfort. He ran out of lactulose and wanted a refill.

He was not taking any multivitamin, or any calcium/vitamin D supplements. He lives alone, independent with ADL and IADL. He has mild cognitive decline on SLUMS.
Laboratory findings demonstrated hypercalcemia (serum calcium 11.1 mg/dl; normal range 8.5-10.5) and vitamin D deficiency (25 hydroxy vitamin D 17 ng/ml) about 3 months ago.

He was treated with ergocalciferol 50,000 IU weekly for 8 weeks, and was started on regular calcium and vitamin D supplements with 1000 mg of calcium and 800 IU of vitamin D daily. His magnesium and phosphate were within normal range; but PTH was 149 pg/ml (normal range 11.1 – 79.5 pg/ml). He had good renal function with a GFR >60. His femoral neck T-score was 0.1 showing no bone loss. He was not taking medications known to alter serum calcium, e.g., HCTZ, Lithium, bisphosphonate. His PTH continued to be high even after vitamin D and calcium normalized.

A parathyroid scan showed Right Inferior Parathyroid Adenoma. Patient was diagnosed with Primary hyperparathyroidism (PHPT) and was referred for further evaluation by an endocrine surgeon.

References

