A variety of systemic conditions that involve various tissues result from changes in serum calcium and phosphorus levels. Skin, tendons, muscles, soft tissue, kidneys, eyes, nervous system, gut, and vascular systems can be involved. This study is based on the cases picked with hyperparathyroidism and its various manifestations and the management adopted in a tertiary care setting in Karachi, Pakistan.

**INTRODUCTION**

Parathyroid glands were first described in humans in 1880; Von Recklinghausen noted the relationship of parathyroid glands to fibrocystic bone disease in 1891 with the description of von Recklinghausen disease. Parathyroid disease usually manifest itself in terms of an over functioning state called hyperparathyroidism. Hyperparathyroidism is a condition caused by excessive and uncontrolled secretion of PTH by the parathyroid glands, increased level of parathyroid hormone (PTH) affect bone, the GI tract, and the kidneys, which cause elevation of the serum calcium level, generalized bone disease, decreased serum phosphorus levels. This occurs due to increased renal excretion and decreased reabsorption of calcium, and increased excretion of phosphorus.

A variety of systemic conditions that involve various tissues result from changes in serum calcium and phosphorus levels. Skin, tendons, muscles, soft tissue, kidneys, eyes, nervous system, gut, and vascular systems can be involved. This study is based on the cases picked with hyperparathyroidism and its various manifestations and the management adopted in a tertiary care setting in Karachi, Pakistan.

**METHODS**

Six cases presented with bony manifestations in mandible, femur, tibia and maxilla while one presented with an overt neck swelling. Renal calculi showed in one case. All cases were subjected to assessment of serum parathyroid hormone level and radionuclide scan. Sonography was done in addition to two of the cases. In all cases parathyroid tumors were identified and subjected to exploratory parathyroid surgery. In addition bony pathologies were subjected to excisions of the lesions.

**RESULTS**

In all cases serum parathyroid hormone levels were raised. MIBI scans picked parathyroid tumors in almost all the cases. Six of the excised tumors were parathyroid adenomas while one was adenocarcinoma. Additional surgeries done in these cases include excisions of mandibular growths, maxillectomy and osteotomies on tibia and femur. All were giant cell tumors. One case with adenocarcinoma expired. The other cases showed normalization of parathyroid hormone levels.

**Conclusion:** Parathyroid adenoma is the common benign tumor of parathyroid gland usually presenting with exaggerated parathyroid hormone levels. Ultrasound scan screening with 99m Tc Sestamibi scanning is a powerful tool in establishing the diagnosis. Parathyroid surgery is safe in experienced hands and is the standard treatment modality to reverse the morbidity associated with pathologies. In all bony lesions with a doubtful clinical diagnosis, screening for Parathyroid lesions is mandatory. Gross disfigurements, functional disabilities call for excision of bony lesions.

**KEY WORDS:** Parathyroid Gland, Adenoma, Giant Cell Tumour, Sestamibi Scan.

**INTRODUCTION**

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**METHODOLOGY**

Four females and 3 males reported during the study period. The age ranged between 14 and 47 years. 4 of the cases had bony manifestations in terms of giant cell and Brown tumors involving mandible, maxilla, tibia and femur. Some cases showed concurrently presenting bony lesions. In majority of the cases serum calcium was within the normal limits while the serum parathyroid hormone (PTH) was exaggerated with range of 287 to 882 pg/ml (Table 1). In one case renal calculi was seen as a major manifestation. One case was distinct where the parathyroid tumor presented as a bulging lesion in the neck close to pharynx.

**DISCUSSION**

Primary hyperparathyroidism (PHPT) is a disorder of the parathyroid glands, also called parathyroidism. “Primary” means this disorder originates in the parathyroid: One or more gets enlarged. Overactive parathyroid glands secretes excessive parathyroid hormone (PTH). In secondary hyperparathyroidism, a problem elsewhere causes the parathyroid to become overactive. This may happen in case of any renal disease or failure.
Hyperparathyroidism is hereditary. More women develop hyperparathyroidism than men, especially women who have more than one first-degree relative with hyperparathyroidism and are also more common in older people. People who have vitamin D deficiency can also be at risk of developing hyperparathyroidism, because vitamin D helps body absorb the calcium in bloodstream. People who take lithium (typically prescribed to treat bipolar disorder) are also at an increased risk for hyperparathyroidism.\(^1\)

The main symptom that people with hyperparathyroidism complain about is fatigue. The vast majority of patients have some psychosomatic symptoms such as lack of energy, anxiety, inability to sleep well, anxiety, irritability, etc that their illness seems more consistent with the diagnosis of depression. High blood pressure is another indication of hyperparathyroidism. Nearly 75% of patients with parathyroid disease will have hypertension as a sign.\(^2\)

The effects of hyperparathyroidism on bone are numerous. Excess PTH results in an increase in bone breakdown by osteoclasts leading to resorption with subsequent fibrous replacement and reactive osteoblastic activity. The bone may have micro fractures, with subsequent hemorrhage and fibrosis of tissue and an influx of macrophages. The resulting mass is called giant cell tumor or osteoclastoma. The bone may have the same color of the vascular elements and blood in the mass. The process of bone resorption and fibrous replacement results in the characteristic radio logic features of generalized bone demineralization, resorption, cysts, bone tumors, erosion of the dental lamina dura, and pathologic fractures.\(^3\)

In this series just in one case the parathyroid lesion became obvious due to significant increase in the size of parathyroid gland otherwise they are rarely obvious. It was obvious to be a rare tumor.\(^4\) It was difficult to diagnose in part because of its rarity, lack of definitive diagnostic markers and overlap-ping clinical features of benign primary hyperparathyroidism. In great number of cases which lead to the suspicion of hyperparathyroid state were the bony tumors masses involving mandible, maxilla, and riba and femur in one case reported were tangible bone and ibia with a parathyroid adenoma.\(^5\) Giant cell tumor of the bone is a rare primary bone tumor that affects young adults.\(^6\) In 10% of cases the bony tumors are not large but the parathyroid tissue is very dense. They are located in the bone, and they are difficult to diagnose.\(^7\) Pathologist should aggressively behave.\(^8\) Hyperparathyroidism promotes giant cell tumor (GCT) formation and its control allows the bone changes to revert. In the facial skeleton GCT are frequent in mandible while the GCTs in other sites are infrequent.\(^9\)

There is a well established relationship between primary hyperparathyroidism and recurrent cancer.\(^10\) A substantial number of patients with primary hyperparathyroidism (PTH) and sexual disorders have been confirmed in only one case. In a study published on Pakistan on hyperparathyroidism, the majority of patients had renal stone disease. 32.4% had bone disease alone and 27% had both bone abnormally and stones. There were 5.4% of patients.\(^11\) Serum Calcium level were close to normal points in most of the cases. This can be explained possibly as to be due to a transient association between bone resorption and formation with the raised circulating PTH.\(^12\) Patients with primary hyperparathyroidism may have a decreased suppressibility of PTH secretion.\(^13\) One study showed normal hypercalcemic state in primary HPTS questioning the credibility of serum calcium as a screening tool.\(^14\) 

In this series just in one case the parathyroid gland was found within the bone. The bone lesion became observable due to significant increase in the size of parathyroid gland otherwise they are rarely obvious. It was obvious to be a rare tumor.\(^15\) It was difficult to diagnose in part because of its rarity, lack of definitive diagnostic markers and overlap-ping clinical features of benign primary hyperparathyroidism. In great number of cases which lead to the suspicion of hyperparathyroid state were the bony tumors masses involving mandible, maxilla, and riba and femur in one case reported were tangible bone and ibia with a parathyroid adenoma.\(^16\) Giant cell tumor of the bone is a rare primary bone tumor that affects young adults.\(^17\) In 10% of cases the bony tumors are not large but the parathyroid tissue is very dense. They are located in the bone, and they are difficult to diagnose.\(^18\) Pathologist should aggressively behave.\(^19\) Hyperparathyroidism promotes giant cell tumor (GCT) formation and its control allows the bone changes to revert. In the facial skeleton GCT are frequent in mandible while the GCTs in other sites are infrequent.\(^20\)

The association of MIBI and ultrasound is recommended because of the limitations of radiopharmaceutical and ultrasound for hyperparathyroid glands identification.\(^21\) Although adenomas less than 1 cm may be difficult to visualize sonographically, knowledge of typical imaging characteristics of parathyroid adenomas and use of special sonographic techniques may facilitate identification in most patients.\(^22\) Comparison between MIBI and tetrofosmin showed tetrofosmin has the same success rate as sestamibi for both adenomas and parathyroid adenomas.\(^23\) Though the standard text suggest that the overall sensitivities of both radiopharmaceuticals are similar, yet some recent work showed tetrofosmin has the same success rate as sestamibi for both adenomas and parathyroid adenomas.\(^24\)

It is impressive that 6 of the seven cases in this series had unequivocal parathyroid surgeries. Postoperative health-related quality of life improved significantly. Among patients with preoperative symptoms of depression and anxiety, both symptoms were alleviated significantly at the 12-month follow-up. Surgery for PHPT has been reported to be effective in reducing neuropsychological morbidity associated with PHPT.\(^25\) Parathyroid surgery, the definitive treatment for PHPT, has been shown to increase bone mineral density, and appears to reduce fracture risk and recurrence of secondary bone tumors.\(^26\) In the current group of patients there was no recurrence reported in the 2 year follow-up period, the result quite in conformity with the recent published material.\(^27\)

The other issue being the fact that skeletal manifestations of this disease are not rare. Though sestamibi-(99m)Tc scintigraphy and ultrasonography for demonstration of hyperparathyroid glands are Esp. Bere Nav 2008 Jan-Feb; 27(1):3-12.\(^28\)


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CONCLUSION

This small study is very clearly reflective of the fact that PHPT should be suspected in bony tumorous masses and recurrent cancer.\(^36\) In the presence of unexplained bony lesions parathyroid lesion screening is mandatory. The pathology is parathyroid adenoma with secretion of excessive parathyroid hormone.\(^37\) Sestamibi scintigraphy and ultrasound were employed to confirm the presence of parathyroid pathologies.\(^38\) Studies indicate that the MIBI scintigraphy is a very sensitive tool for pre-operative localization of parathyroid tumours.\(^39\) Ultrasound and bone scanning with 99m Tc-99m sestamibi are also used and should be used as the first imaging method. The diagnosis. Parathyroid surgery is safe in experienced hands and is rewarding for reverting the morbidity associated with parathyroid disease.\(^40\) Parathyroid disease is disfiguring and compromising the function it is used.\(^41\) Parathyroid surgery is safe in experienced hands and is rewarding for reverting the morbidity associated with parathyroid disease.\(^42\) Parathyroid disease is disfiguring and compromising the function it is used.

REFERENCES
ORIGINAL ARTICLE

SONOGRAPHIC MEASUREMENT OF NORMAL RENAL SIZE AND CORRELATION WITH SOMATIC VARIABLES IN SUBSET OF KARACHI PEDIATRIC POPULATION

Naila Younus, Farheen Raza, Sanober Bhugio, Nosheen Zehra, Pashmina Gul, Waseem Mehmood Nizamani, Shumaila Younus

ABSTRACT

Background: Multiple renal pathogenesis manifested as unilateral or bilateral size changes, therefore there should be normative reference data for proper comparison. Our goal is to determine normal standard value ranges for renal dimensions in pediatric population in Karachi. Sonographically renal length in 150 children were measured and correlate with age, gender, body height, weight and BMI.


Methods: A six month cross sectional hospital based assessment of kidney size (length, width) was evaluated with the help of sonography. XarioTM 200 Toshiba with convex 3.5 frequency transducer will be used. The mean renal dimensions with standard deviation (SD) were estimated for every group of age. The renal length and width were determined and corresponded with different somatic variables. Descriptive statistics with Regression analysis was done.

Results: The normal length and the width of kidneys and its ranges were obtained. Right kidney length moderately and significantly correlated with height and weight (r=0.651, r=0.654) and age (r=0.538) respectively. However, moderately insignificant with BMI (0.129). Lefts kidney moderately and significantly correlated with height and weight (r=0.665 r=0.705), negative insignificant with age (0.564) and moderately weak insignificant relationship with BMI (0.174).

Conclusion: The research presents the normal range parameters of renal size and measurements by sonography in healthy pediatric population in Karachi. Guideline measurements of kidneys represent a statistically important and comprehensive interaction with specifications of growth which allows us to easily calculate the renal size by derived regression analysis.

KEY WORDS: Renal Size, Sonography, Children, Chronic Renal Disease.

INTRODUCTION

Renal size and function determined the health status of the kidney1. Proper body developments and functions are directly related to organ growth rate. The growth rate of renal length will be evaluated with help of distinct measurements like weight, height and anthropometric parameters such as body mass index (BMI)2. It can be helpful and facilitate us for follow up for the treatment of children with chronic pyelonephritis, obstructive uropathy, and chronic glomerulonephritis in early childhood3,4. Sonography helps in accessing and following the patients of urolithiasis, cystic kidney...

Naila Younus
Resident, Department of Radiology, Ziauddin University and Hospitals, Karachi.

Farheen Raza
Resident, Department of Radiology, Ziauddin University and Hospitals, Karachi.

Sanober Bhugio
Resident, Department of Radiology, Ziauddin University and Hospitals, Karachi.

Nosheen Zehra
Assistant Professor, Department of Community Health and Medicine, Ziauddin University and Hospitals, Karachi.

Pashmina Gul
Assistant Professor, Department of Radiology, Ziauddin University and Hospitals, Karachi.

Waseem Mehmood Nizamani
Senior Registrar, Department of Radiology, Ziauddin University and Hospitals, Karachi.

Shumaila Younus
MPhil Candidate, Department of Oral Pathology, Ziauddin University and Hospitals, Karachi.

Corresponding Author
Naila Younus