

A HOSPITAL-BASED SURVEY OF PRIMARY HYPERPARATHYROIDISM IN THE ASIR REGION: LOW PREVALENCE OR UNDERDIAGNOSIS?

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Background: The number of patients with primary hyperparathyroidism (PHP) seen at the Asir Central Hospital (ACH) is remarkably low. This observation has raised the question of whether there is a low prevalence of PHP in the Asir region, whether it is underdiagnosed, or perhaps a combination of both factors.

Patients and Methods: A survey of 15 hospitals in the Asir region was conducted for cases of PHP. All case notes of the patients with PHP seen at ACH were reviewed. Also, a sample of patients seen at ACH was chosen randomly. The charts of those found to have hypercalcemia were reviewed for the inclusion of PHP in the diagnostic work-up.

Results: Only 13 patients with PHP were discovered. The eight patients with PHP seen at ACH had advanced bone manifestations and seven of them had renal manifestations. Hypercalcemia was found in 39 out of 655 patients seen at ACH. None of these had been investigated for PHP.

Conclusion: The number of patients with PHP seen in hospitals in the Asir region is very low. Underdiagnosis seems to be an important factor. Therefore, it is felt that there is a need for greater awareness of the disease in the region. Furthermore, there is a need for a national survey to measure the prevalence of PHP in Saudi Arabia. *Ann Saudi Med 1999;19(4):322-324.*

Key Words: Primary hyperparathyroidism, hypercalcemia.

The number of patients with primary hyperparathyroidism (PHP) seen at the Asir Central Hospital (ACH) seems to be very small. This observation prompted us to find out whether there is a low prevalence of PHP in the Asir region, whether PHP is underdiagnosed, or whether this low number is a combination of both factors.

The region of Asir has a population of 1,200,000, and covers more than 80,000 km². It is located in southwestern Saudi Arabia. The area extends from the high Asir mountains, almost 3200 m above sea level, down to the Red Sea. ACH is a 570-bed tertiary care hospital affiliated with the Abha Medical College. Located in Abha city, the regional capital, ACH is the main referral hospital in the Asir region, and is considered the only governmental source of secondary and tertiary health care for a population of about 753,000.

Statistics from Western countries¹⁻⁴ indicate a 0.1-0.5% prevalence rate for PHP. This would translate into 1200-6000 cases for the Asir Region. A review of the Saudi bibliography from 1887 to 1984,⁵ and of the *Annals of Saudi Medicine*, the *Saudi Medical Journal*, the *Journal of Family and Community Medicine*, and the *Saudi Journal*

of Gastroenterology up until May 1998 revealed no reports on the prevalence of PHP in Saudi Arabia. Thus, this study was conducted with the following objectives: 1) to identify the prevalence of PHP in all hospitals of the Asir Region; 2) to describe the clinical presentation of patients with PHP at ACH; and 3) to assess the inclusion of PHP in the diagnostic work-up of patients with hypercalcemia found on routine blood examination of patients admitted to ACH for other medical conditions.

Patients and Methods

A survey of the 15 hospitals in the Asir Region was carried out (Table 1), and the diagnostic index of the medical records in these hospitals was reviewed with the aim of finding any patient with the diagnosis of PHP. These diagnoses were confirmed either by a second review by the author or a confirmation statement by the director of each hospital. The same issue was presented in the form of a questionnaire at two regional surgical meetings, involving the surgeons working in the Asir Region, and the other, an orthopedic regional meeting to confirm the findings. The records of the central histopathology laboratory located at ACH were also reviewed. This facility receives pathology specimens from 11 hospitals in the Asir area.

The medical records of patients with PHP at ACH were reviewed. The diagnosis of PHP was based on clinical manifestations, calcium level, and PTH level in all these

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TABLE 1. Cases of primary hyperparathyroidism seen at different hospitals in the Asir Region.

Hospital	# of beds	Years	# of cases
Asir Central	570	10	8
Armed Forces	200	5	5
Khamis Civil	194	16	0
Dahran Al-Janoub	100	16	0
Mahiel General	150	18	0
Sabt Al-Alaya	100	7	0
Regal Alma	60	7	0
Al-Namas General	126	7	1*
Bellamar General	110	7	0
Tathleeth General	90	6	0
Sarat Abeda General	100	5	0
Al-Majardah General	140	5	0
Prince Abdullah Bin Abdulaziz in Bisha	345	5	0
Abha Private	50	5	0
Al-Khamis Al-Ahly	50	5	0
Total	2385		13

*Included in ACH series.

cases. The age, gender, manifestations of the disease at presentation, pathological changes in the parathyroid glands, and surgical procedure were documented. Also, the laboratory records of 655 patients at ACH who were randomly selected were reviewed for elevated serum calcium above 2.6 mmol/L (normal serum calcium concentration at ACH is between 2 and 2.6 mmol/L). These included all patients whose serum calcium levels were measured from 1 January 1 to 21 January 1994. The medical records of those patients with elevated serum calcium level above 2.6 mmol/L were reviewed for inclusion of PHP in the diagnostic work-up.

Results

The survey revealed that only 13 patients were diagnosed as having PHP over a period ranging from 5-18 years in different hospitals in the Asir Region (Table 1). Eight of these were at ACH and six of them were females (Table 2). The age range was between 30 and 77 years, with a median of 40. All the patients presented with advanced bone manifestations. Seven of them had renal manifestations of the disease. These manifestations ranged from unilateral renal stone that was passed spontaneously in some, to repeated attacks of renal colic in others. One patient had to have nephrectomy for severe renal damage. All of these patients presented previously to different hospitals and primary health centers with complaints which were suggestive of PHP, but the diagnosis was missed in all.

All eight patients were treated surgically. Excision of parathyroid adenoma was done in five patients, subtotal parathyroidectomy in two, and total parathyroidectomy with implantation in the left forearm in one. Manifestations of the hungry bone syndrome occurred in five patients. These required calcium replacement with

very close and intensive monitoring. All patients are now normocalcemic, with an average follow-up of 3.5 years (range 1-6 years).

Out of the 655 patients whose calcium levels were estimated, 39 had elevated calcium level. None of these patients was investigated for PHP. Of these, 16 patients were in the pediatric age group, 11 cases were not fully documented, one patient had primary osteogenic sarcoma, one had metastatic carcinoma, and the remaining 10 cases had hypercalcemia that could not be explained solely on the basis of the admitting diagnoses.

Discussion

Two striking observations are shown in this study. First, the advanced bone and renal manifestations seen in PHP patients in the Asir Region are not seen in this disease in the developed countries, where the disease is usually recognized long before it reaches that stage.⁶ Moreover, with the widespread use of multiphasic blood tests, the disease is sometimes diagnosed in the asymptomatic stage. Only 23% of patients in the series by Cope in 1966⁷ presented with bone disease, compared to 100% in this study.

The second observation is the very small number of patients with PHP in the Asir Region. Various studies since 1969 indicate a prevalence of primary hyperparathyroidism of 0.1% to 0.2% in various hospital populations in Western countries.¹⁻⁴ In Sweden, it was estimated that the prevalence in adult workers was as high as 0.52%. The incidence of the disease seems to have increased substantially in the developed countries, largely because of routine blood calcium measurement. Thus, if the prevalence of PHP in the Asir Region were similar to that reported in the Western countries, 1200 to 6000 cases of PHP would be expected to be found here.¹⁻⁴

Referral bias was a concern during the planning of this study, therefore, all hospitals in the Asir Region, including the Ministry of Health, Military, University-affiliated, and private, were surveyed. This has hopefully limited bias, although out-of-region referral should still be taken into consideration. The other concern was the known shortcomings of extracting data from medical records.⁸ This was dealt with by a second review of the records by the author, by a review of the operative and pathology records, and by presenting the findings at three different meetings of the general and orthopedic surgeons in the Asir Region. Despite these limitations, the difference in the number of patients is so large that it would be fair to conclude that the number of patients is actually quite low.

This low prevalence is more apparent than real, and the following facts support underdiagnosis of PHP as an important cause for this low number of cases in this region: 1) All of the diagnosed patients were diagnosed in an advanced stage of the disease; 2) all patients were seen previously in different hospitals for reasons that are likely

TABLE 2. Clinical manifestations of patients with primary hyperparathyroidism (PHP) at Asir Central Hospital.

Age/sex	Mode of presentation	Ca mmol/L	P mmol/L	Other manifestations
30/F	Fracture rt radius	3.8	0.78	Lt ureteric stones removed surgically 5 yr ago; rt ureteric stones removed surgically 1 yr ago
37/F	Fracture rt humerus	2.8	0.68	Easy fatigability; anorexia; lower back ache; rt renal stones
40/F	Fracture lt humerus	2.8	0.71	Lt ureteric stone removed surgically 6 yr ago; rt ureteric stone surgically removed 3 yr ago
40/M	Generalized bone ache and bone swelling in the foot and maxilla	3.4	0.68	Fatigability; development of psychiatric symptoms; swelling excised from rt foot; treated as gout
77/F	Advanced bone disease	2.7	0.78	Generalized bone ache
34/M	Obstructing lt renal stone and rt ureteric stone	3.0	0.97	Easy fatigability; generalized muscular and bone ache
40/F	Fracture lt femur	3.0	0.74	Generalized bone ache; symptoms of depression; lt renal stone that passed spontaneously at the age of 4 yr
50/F	Bone cyst lt radius	2.7	0.68	Easy fatigability; bilateral renal stones removed surgically 4 yr ago

Normal serum Ca concentration at ACH=2-2.6 mmol/L; normal P concentration at ACH=0.87-1.45 mmol/L.

to be related to PHP without being diagnosed; and 3) a review of 655 patients whose serum calcium level was estimated over a period of only three weeks revealed the presence of 39 patients with hypercalcemia. The clinical and laboratory findings in at least 10 of these patients should have led to the consideration of PHP in the differential diagnosis, yet none of these patients was investigated for PHP despite the fact that it is the most

frequent cause of hypercalcemia in the general population.⁹ The other important factor that should be considered in explaining this low number of cases of PHP in the Asir region is the prevalence of the disease. A search in the English literature on the incidence and prevalence of the disease in developing countries was not rewarding. A review of the Saudi bibliography from 1887 until 1984,⁵ and of the *Annals of Saudi Medicine*, the *Saudi Medical Journal*, the *Journal of Family Medicine*, and the *Saudi Journal of Gastroenterology* until May 1998, revealed no reports about the prevalence of PHP in Saudi Arabia.

PHP is an underdiagnosed disease in the Asir Region and probably in all of Saudi Arabia. The medical community needs to be more aware of the disease. Specifically, the diagnosis should be considered in patients with bilateral or recurrent renal stones, patients with suggestive radiological bone changes, and in patients with high serum calcium level. There is a need for a prospective national survey of the prevalence of PHP in Saudi Arabia.

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