The first patient was referred to ophthalmology because of poor diabetes control on the occasion of an admission for ketoacidosis, while the second patient visited a private ophthalmologist on her own initiative with no visual symptoms. In both patients, ophthalmological examination revealed a posterior, diffuse subcortical cataract with a ''snowflake'' image. In the first patient, the ophthalmological complication led to an improved adherence to diabetes treatment, which decreased HbA1c levels to 7.5–8.5% in the subsequent two years. Cataract progression stabilized, but the condition has not been surgically treated yet. The second patient underwent surgery with no complications.

Cataract occurring in children and adolescents with type 1 diabetes mellitus at an early stage (either at diabetes onset or after only a few years of very poor metabolic control) is called ''acute cataract'', ''metabolic cataract'', ''true diabetic cataract'' and, because of its typical image, ''snowflake'' cataract.[1] There are reports in the literature of some cases occurring in children and adolescents[4–10] as early as at five years of age.[7]

Cataract is the result of severe, long-standing hyperglycemia due to a sustained poor metabolic control[4,5] or occurring before diagnosis. Cataract has been shown to be related to initial HbA1c levels higher than 12.8%[8] and to a prior period with cardinal symptoms longer than 6 months,[9] scenarios which agree with those of our patients. Surgery is usually required, but there have been reports of patients where the condition has been reversed after achieving a good glycemic control.[10]

Cataract is so exceptional in children that it is not mentioned in the guidelines of the American Diabetes Association (ADA),[2] while the International Society for Pediatric and Adolescent Diabetes (ISPAD) makes a low grade recommendation, ''E'', suggesting ''that an ophthalmological examination should be considered at diagnosis of diabetes to detect cataract and refraction disorders''.[3]

Although this is a rare comorbidity, children and adolescents with diabetes should be monitored for cataract, especially if they have had periods of severe, prolonged hyperglycemia, both before and after diagnosis, regardless of age and lack of pubertal development.

References

1. Pollreisz A, Schmidt-Erfurth U. Diabetes cataract-pathogenesis, epidemiology and treatment. J Ophtalmol. 2010;2010:608751.
2. American Diabetes Association. 11. Children and adolescents. Diabetes Care. 2016;39 Suppl. 1:S86–93.
3. Donaghue KC, Wadwa RP, Dimeglio LA, Wong TY, Chiarelli F, Marcovecchio ML, et al. International Society for Pediatric and Adolescent Diabetes Clinical Practice Consensus Guidelines 2014. Microvascular and macrovascular complications. Pediatr Diabet. 2014;15 Suppl. 20:S257–69.
4. Al-Agha A, Ocheltree A, Rashad R, Abdelsalam I. Metabolic cataract in an 8-year-old diabetic boy. Turk J Pediatr. 2012;54:83–5.
5. Montgomery EL, Batch JA. Cataracts in insulin-dependent diabetes mellitus: sixteen years' experience in children and adolescents. J Paediatr Child Health. 1998;34:179–82.
6. Uspal NG, Schapiro ES. Cataracts as the initial manifestation of type 1 diabetes mellitus. Pediatr Emerg Care. 2011;27:132–4.
7. Wilson ME Jr, Levin AV, Trivedi RH, Kruger SJ, Elliott LA, Ainsworth JR, et al. Cataract associated with type-1 diabetes mellitus in the pediatric population. J AAPOS. 2007;11:162–5.
8. Iafusco D, Prisco F, Romano MR, Dell'omo R, Libondi T, Costagliola C. Acute juvenile cataract in newly diagnosed type 1 diabetic patients: a description of six cases. Pediatr Diabet. 2011;12:642–8.
9. Falck A, Laatikainen L. Diabetic cataract in children. Acta Ophthalmol Scand. 1998;76:238–40.
10. Jin YY, Huang K, Zou CC, Liang L, Wang XM, Jin J. Reversible cataract as the presenting sign of diabetes mellitus: report of two cases and literature review. Iran J Pediatr. 2012;22:125–8.

Emilio García García[a,*], Emilia García Robles[b]

[a] *Unidad de Endocrinología Pediátrica, Hospital Virgen del Rocío, Sevilla, Spain*
[b] *Servicio de Oftalmología, Hospital Virgen del Rocío, Sevilla, Spain*

* Corresponding author.
E-mail address: ejgg67@gmail.com (E. García García).

2530-0180/

Impact of calcimimetics in surgery of secondary hyperparathyroidism☆

Impacto de los calcimiméticos en la cirugía del hiperparatiroidismo secundario

Secondary hyperparathyroidism (SHPT) affects approximately 100% of patients on a dialysis program. Almost 90% are controlled with conservative treatment, while the rest require more aggressive treatment for control. Surgery has traditionally been the treatment of choice for these difficult to control cases.[1,2] Since 2005, when the calcimimetic cinacalcet was approved by the European Medicines Agency, therapeutic management of SHPT has gradually changed. Cinacalcet has progressively become the first treatment option for patients with difficult to control SHPT. There is however little information as to whether this has had a real long term impact on the need for surgery in patients with difficult to control SHPT.[3–5] The study objective was to analyze the impact of cinacalcet on surgery for SHPT at our hospital after 10 years of use.

The study population consisted of patients with chronic kidney failure on a dialysis program who had undergone surgery for SHPT from January 1995 to December 2014. Patients with prior thyroid and/or parathyroid surgery, and

☆ Please cite this article as: Ruiz J, Ríos A, Rodríguez JM, Llorente S, Hernández AM, Parrilla P. Impacto de los calcimiméticos en la cirugía del hiperparatiroidismo secundario. Endocrinol Diabetes Nutr. 2017;64:59–61.

those diagnosed with multiple endocrine neoplasia syndrome, were excluded For data analysis, two periods were distinguished based on the date of introduction of cinacalcet at our hospital: 1) pre-cinacalcet period: 1995 to 2004; and 2) post-cinacalcet period: 2005–2014. Epidemiological, clinical, therapeutic, and evolutionary variables were analyzed. SHPT persistence was defined as absence of a decrease greater than 50% from preoperative PTH levels within six months of surgery. Relapse or recurrence was defined as a PTH increase above 250 pg/mL after the six months following surgery. Statistical analysis was performed with SPSS v.15.0 for Windows, using Chi-square, Fisher exact, Student's *t*, and Mann–Whitney *U* tests.

During the study period, 76 patients with SHPT refractory to conservative management underwent surgery. Mean patient age was 51 ± 14.4 years, and there were 57.9% (n = 44) male patients. Ninety-three percent of patients underwent surgery in the pre-cinacalcet period, and the remaining 7% (n = 5) after introduction of the calcimimetic as treatment for SHPT ($p < 0.001$). Of all patients on dialysis, 10.1% by year underwent surgery for HPT in the pre-cinacalcet period, as compared to 1.3% in the post-cinacalcet period ($p < 0.001$). As shown in Fig. 1, such decrease was more pronounced as time elapsed since introduction of cinacalcet and patients were treated earlier. Thus, 2.2% of patients on dialysis underwent surgery for SHPT in the 2005–2009 period, as compared to 0.3% in the 2010–2014 period. Comparison of patients in the pre-cinacalcet versus the post-cinacalcet era showed no differences in any of the variables analyzed, except for laboratory values. Thus, patients who underwent surgery in the pre-cinacalcet period had higher values of calcium-phosphorus product (70.4 vs 51.9; $p = 0.002$) and serum phosphorus levels (6.6 vs 5.3 mg/dL; $p = 0.035$). The surgical procedure performed in all patients was subtotal parathyroidectomy. There were three recurrences (3.9%) of SHPT, all in the pre-cinacalcet group.

After approval of cinacalcet, the number of indications of parathyroidectomy has markedly decreased. Cinacalcet provides a better control of SPHT than the drugs previously used, as shown by our study. After introduction of cinacalcet, there was a highly significant decrease in the number of surgical procedures for SHPT at our hospital from 10.1% to 1.3% by year in patients on dialysis. Moreover, in the last study period, from 2010 to 2014, the proportion has decreased to 0.3% by year in patients on dialysis. It should be noted that Spain has one of the highest kidney transplant rates worldwide, and during the study period there has been a progressive increase in the number of kidney transplants,[6] a factor which also decreases the surgery rate in SHPT, because it allows for early transplant in these patients without prior parathyroidectomy.

Today, parathyroidectomy is only performed in SHPT in cases difficult to control after treatment with cinacalcet (severe hypercalcemia, calciphylaxis and/or PTH levels higher than 500 pg/mL) or in patients with associated complications such as tendon rupture, severe bone pain, or refractory anemia. Surgery should be performed at experienced endocrine departments.[7–9]

In conclusion, cinacalcet has had a direct impact on control of SHPT, resulting in a highly significant decrease in the need for surgery of hyperparathyroidism in patients with chronic kidney failure on dialysis.

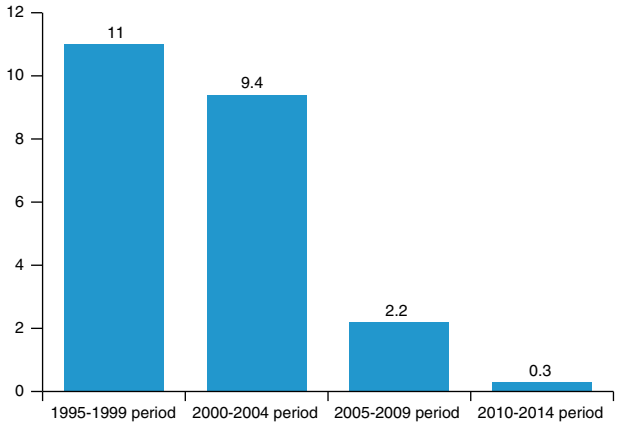

Figure 1 Percentage of patients on dialysis who underwent surgery for secondary hyperparathyroidism by year in each study period.

References

1. Pitt SC, Sippel RS, Chen H. Secondary and tertiary hyperparathyroidism, state of the art surgical management. Surg Clin North Am. 2009;89:1227–39.
2. Schneider R, Waldmann J, Ramaswamy A, Fernández ED, Bartsch DK, Schlosser K. Frequency of ectopic and supernumerary intrathymic parathyroid glands in patients with renal hyperparathyroidism: analysis of 461 patients undergoing initial parathyroidectomy with bilateral cervical thymectomy. World J Surg. 2011;35:1260–5.
3. Sekercioglu N, Busse JW, Sekercioglu MF, Agarwal A, Shaikh S, Lopes LC, et al. Cinacalcet versus standard treatment for chronic kidney disease: a systematic review and meta-analysis. Ren Fail. 2016;38:857–74.
4. Jeong S, Kim IW, Oh KH, Han N, Joo KW, Kim HJ, et al. Pharmacogenetic analysis of cinacalcet response in secondary hyperparathyroidism patients. Drug Des Devel Ther. 2016;10:2211–25.
5. Brunaud L, Ngueyon Sime W, Filipozzi P, Nomine-Criqui C, Aronova A, Zarnegar R, et al. Minimal impact of calcimimetics on the management of hyperparathyroidism in chronic dialysis. Surgery. 2016;159:183–91.
6. Organización Nacional de Trasplantes. Memoria trasplante renal; 2014 [accessed 07.08.16]. Available from: http://www.ont.es/infesp/Memorias/Memoria%20trasplante%20renal%202014.pdf
7. Torregrosa JV, Bover J, Cannata Andía J, Lorenzo V, de Francisco AL, Martínez I, et al., Spanish Nephrology Society. Spanish Society of Nephrology recommendations for controlling mineral and bone disorder in chronic kidney disease patients (SEN-MBD). Nefrologia. 2011;31 Suppl. 1:S3–32.
8. Lorenz K, Bartsch DK, Sancho JJ, Guigard S, Triponez F. Surgical management of secondary hyperparathyroidism in chronic kidney disease – a consensus report of the European Society of Endocrine Surgeons. Langenbecks Arch Surg. 2015;400:907–27.
9. Zambudio AR, Rodríguez J, Riquelme J, Soria T, Canteras M, Parrilla P. Prospective study of postoperative complications after total thyroidectomy for multinodular goiters by surgeons with experience in endocrine surgery. Ann Surg. 2004;240:18–25.

José Ruiz[a,b], Antonio Ríos[a,b,c,*], José Manuel Rodríguez[a,b,c], Santiago Llorente[d], Antonio Miguel Hernández[e], Pascual Parrilla[a,b,c]

[a] *Departamento de Cirugía, Ginecología, Obstetricia y Pediatría, Universidad de Murcia, Murcia, Spain*
[b] *Servicio de Cirugía General y del Aparato Digestivo, Hospital Clínico Universitario Virgen de la Arrixaca, Servicio Murciano de Salud, El Palmar, Murcia, Spain*
[c] *Instituto Murciano de Investigación Bio-Sanitaria Virgen de la Arrixaca (IMIB-Arrixaca), El Palmar, Murcia, Spain*
[d] *Servicio de Nefrología, Hospital Clínico Universitario Virgen de la Arrixaca, Servicio Murciano de Salud, El Palmar, Murcia, Spain*
[e] *Servicio de Endocrinología y Nutrición, Hospital Clínico Universitario Virgen de la Arrixaca, Servicio Murciano de Salud, El Palmar, Murcia, Spain*

[*] Corresponding author.
E-mail address: arzrios@um.es (A. Ríos).

2530-0180/