

Table 1. Number of cases of miss match, viruria, viraemia, renal function and biopsy in patients with active infection due to BK virus

Patients	Donors	No Mix Match HLA-A, B, DR	Viruria >10 ⁷ Months post-transplant	Viraemia >10 ⁴ Months post-transplant	Decrease of renal function ^a	Biopsy Months post-transplant
1	C	1:2:1	8 to 12	Negative	Yes	Cellular rejection 1A (6m) Cellular rejection 1B (18m)
2	C	2:0:1	9 to 13	12	Yes	BKVAN
3	C	1:1:1	15 to 26	26	No	<i>Borderline</i> rejection G1T 1I1VO (8m) Non-conclusive ^a (30m)
4	C	2:0:1	7 to 10	Negative	No	Normal
5	C	2:2:1	4 to 12	Negative	No	Normal

^a Criteria for reduced renal function: creatinine > 1.4mg/dl and urea > 0.5mg/dl.

BKVAN: BK virus-associated nephropathy; C: cadaveric donor.

plant, and found the highest values of viruria and viraemia (25.4% and 13.7%, respectively) 6 months after transplantation.

Babel et al.¹⁰ showed that 21.4% of patients with persistent viruria developed BKVAN between 5 and 11 weeks after reactivation in urine and blood. In our patient with BKVAN, viruria appeared 12 weeks before viraemia and this became positive almost simultaneously with biopsy findings, without clinical signs of renal dysfunction (no protocol biopsies performed in the centre).

In addition to immunosuppression, other factors such as inflammation and host immunity should be considered in the pathogenesis of BKVAN.

CONCLUSIONS

The positivity of PCR in urine may be the first finding indicative of BKV reactivation. In our patient, screening determined a significant and persistent viral load in urine 12 weeks before viraemia, which could be an advantage for early detection of reactivation and allow adjustment of immunosuppression, although viraemia is more strongly associated with the development nephropathy. The data reported are useful, since so far no literature has been published on the incidence of BKV reactivation in renal transplantation in Argentina.

Conflicts of interest

The authors declare that they have no conflicts of interest related to the contents of this article.

- Polo C, Pérez JL, Mielnichuck A, Fedele CG, Niubo J, Tenorio A. Prevalence and patterns of polyomavirus urinary excretion in immunocompetent adults and children. *Clin Microbiol Infect* 2004;10:640-4.
- Hirsch HH, Brennan DC, Drachenberg CB, Ginevri F, Gordon J, Limaye AP, et al. Polyomavirus-associated nephropathy in renal transplantation: interdisciplinary analyses and recommendation. *Transplantation* 2005;79:1277-86.
- Drachenberg C, Papadimitriou J, Hirsch HH, Wali R, Crowder C, Nogueira J, et al. Histological patterns of polyomavirus nephropathy: correlation with graft outcome and viral load. *Am J Transplant* 2004;4:2082-92.
- Viscount HB, Eid AJ, Espy MJ, Griffin MD, Thomsen KM, Harmsen WS, et al. Polyomavirus polymerase chain reaction as surrogate marker of polyomavirus-associated nephropathy. *Transplantation* 2007;84:340-5.
- Randhawa P, Ho A, Shapiro R, Vats A, Swalsky P, et al. Correlates of quantitative measurement of BK polyomavirus (BKV) DNA with clinical course of BKV infection in renal transplant patients. *J Clin Microbiol* 2004;42:1176-80.
- Shenagari M, Ravanshad M, Hosseini SY, Ghanbari R. Detection and prevalence of polyoma virus BK among Iranian kidney

transplant patients by a novel nested-PCR. *IRCMJ* 2010;12(6):631-5.

- Costa C, Bergallo M, Astegiano S, Terlizzi ML, Sidoti F, Segoloni GP, et al. Monitoring of BK virus replication in the first year following renal transplantation. *Nephrol Dial Transplant* 2008;23:3333-6.
- Hariharan S. BK virus nephritis after renal transplantation. *Kidney Int* 2006;69(4):655-62.
- Hirsch HH, Vicenti F, Friman S, Tuncer M, Citterio F, Wiecek A, et al. Polyomavirus BK replication in de novo kidney transplant patients receiving tacrolimus or cyclosporine: a prospective, randomized, multicenter study. *Am J Transplant* 2013;13:136-45.
- Babel N, Fent J, Karaivanov S, Bold G, Arnold S, Sefrin A, et al. Sustained BK viruria as an early marker for the development of BKV-associated nephropathy: analysis of 4128 urine and serum samples. *Transplantation* 2009;88(1):89-95.

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Chronic kidney disease and acromegaly: when appearances are deceptive

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To the Editor,

We present a new case that illustrates the difficulty in differentiating between a growth hormone (GH) secretion dis-

order and acromegaly in a patient with chronic kidney disease (CKD) due to changes in growth hormone levels caused by uraemia.

CASE REPORT

A 48-year old patient was referred to hospital after the outpatient clinic detected a serum creatinine of 7.56mg/dL.

Significant exam findings included blood pressure: 163/111mmHg, Weight: 105kg, Height: 190cm, Body mass index: 29kg/m². Slight cognitive deficit. Corpulent body phenotype. Facies with prognathism and macroglossia, thick lips, prominent brow ridges (Figure 1), deep voice. Normal on auscultation. Normal fundoscopy. The patient reported no changes in body morphology.

Ultrasound imaging showed kidneys of a size at the lower limit of normal, with markedly thinned bilateral renal parenchyma, almost non-existent.

Laboratory tests on admission showed characteristic uraemia biochemical parameters with negative viral serology and normal immunologic tests. Hormone determinations were also performed:

- Cortisol: 23mcg/dL (6-28) TSH: 1.01mcIU/mL (0.27 to 4.2).
- Renin: 29.7micro IU/mL (2.8 to 39.9).
- Aldosterone: 4.24ng/mL (10-160).
- FSH: 12.4mIU/ml (1.5 to 12.4) LH: 8.4mIU/mL (1.7 to 8.6).
- Prolactin: 553mIU/L (86-324), total testosterone: 1.99ng/mL (2.5-8.4).
- GH: 4.24ng/mL (0-1).
- Somatomedin C (IGF1): 670ng/mL (100-358).
- IGF1-BP3: 7.59micro/mL (3.3 to 6.7).
- ACTH: 39pg/mL (8-46).

Hypertension was controlled with medical treatment. Due to renal function deterioration of unknown etiology, treatment was begun with chronic HD.

An oral glucose overload test (OGOT) was performed (Figure 2).



Figure 1. Patient whose phenotype on admission led to suspicion of acromegaly.

At this point, we suspected acromegaly, based on phenotype and hormone profile (increase in GH, IGF-1 and IGF1-BP3; OGOT with no clear suppression of GH). It was not possible to perform magnetic resonance imaging (MRI) of the pituitary due to patient and family refusal.

Four months later, an MRI was finally performed without paramagnetic contrast. The size of the pituitary was within

normal limits, and the pituitary stalk was centred. A new OGOT was performed, showing normal baseline GH with paradoxical increase at 30 minutes, but with adequate suppression within two hours (Figure 2).

At that time, the levels of IGF-1 (340ng/mL) and IGF1-BP3 (6.3mcg/mL) were also normal. Prolactin continued to be high and testosterone was normal. Cur-

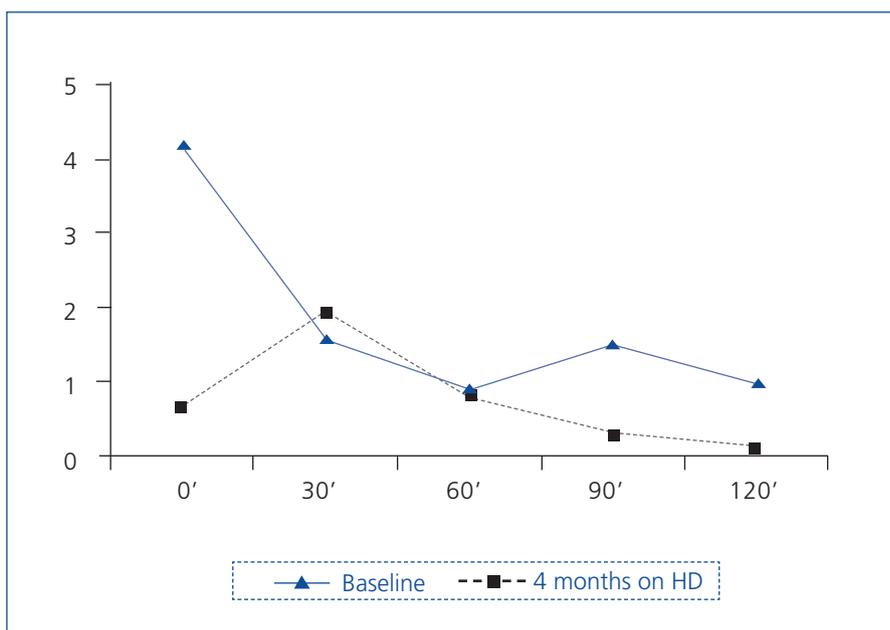


Figure 2. Changes in levels of growth hormone in ng/ml of patient at rest with an oral glucose load of 75g.

Changes in GH levels in ng/mL of patient at rest with a response to an oral glucose overload of 75gr. Results on admission and after 4 months in haemodialysis. Normal Value = 0-1ng/mL.

rently, the patient undergoes regular endocrinology check-ups and continues on haemodialysis.

DISCUSSION

Appearances can be deceiving when it comes to diagnosing acromegaly in uraemic patients. Our patient did not suffer from acromegaly, in spite of the fact that his morphological features and first hormone determinations were compatible with this condition.

After reviewing the literature, we found two similar cases^{1,2}. In the case of our patient, we were uncertain until we had the MRI results.

Repeated functional tests after several months on haemodialysis showed normal values.

Hyperprolactinemia, also seen in our patient, is a common finding in CKD in both sexes³.

Acromegaly is a rare condition in Spain, with an estimated incidence of 3-4 cases per million inhabitants a year and a prevalence of 36 cases per million⁴. OGOT is the test that confirms diagnosis. In healthy individuals, it leads to suppression, within two hours, of serum GH values below 1 ng/mL. Furthermore, it has been reported that several disorders, including renal failure, can lead to OGOT false positives.

There are not many studies that have assessed renal function in acromegaly. In a recent study, a large series of patients was analysed, concluding that acromegaly is characterised by significant changes in renal structure and function⁶. It may be assumed that perhaps through a hyperfiltration mechanism, renal function could eventually deteriorate in these individuals.

Often studies of GH secretion in CKD have been inconclusive or have produced conflicting results, possibly due to the pulsatile nature of GH, increased retention and catabolism in uraemia, variable activity of transporter proteins and the effects of stress, malnutrition and other unknown factors⁷. There is evidence that uraemia causes a

state of resistance to growth hormone^{3,8,9} and this would explain why acromegaly is so rare in renal patients. Some studies have shown that dialysis can significantly reduce GH levels to normal levels^{9,10}, as occurred in our patient.

In conclusion, our case illustrates the difficulty of interpreting GH/IGF-I axis results in uraemia. We should remind doctors of these alterations when assessing probable acromegaly in a patient with CKD. A complete hormone study, including imaging, and monitoring of hormone levels after starting dialysis, will help establish the correct diagnosis.

Conflicts of interest

The authors declare that they have no conflicts of interest related to the contents of this article.

1. Wong NA, Ahlquist JA, Camacho-Hübner C, Goodwin CJ, Dattani M, Marshall NJ, et al. Acromegaly or chronic renal failure: a diagnostic dilemma. *Clin Endocrinol (Oxf)* 1997;46:221-6.
2. Müssig K, Gallwitz B, Ranke MB, Horger M, Häring HU, Quabbe HJ. Acromegaly and end-stage renal disease: a diagnostic challenge. *J Endocrinol Invest* 2006;29:745-9.
3. Caravaca F. Alteraciones endocrinas en la uremia. En: Hernando Avendaño L (ed.). *Nefrología Clínica*. 3.ª edición. Madrid: Editorial Médica Panamericana; 2008. pp. 843-9.
4. Arroyo M, Mestrón A, Webb S. Acromegalia. Concepto, epidemiología y mortalidad de la acromegalia. *La epidemiología de la acromegalia en España*. *Endocrinol Nutr* 2005;52(Suppl 3):2-6.
5. Villabona C, Soler J. Acromegalia. Diagnóstico bioquímico y morfológico: criterios y algoritmo diagnóstico. *Endocrinol Nutr* 2005;52(Suppl 3):23-7.
6. Auriemma RS, Galdiero M, De Martino MC, De Leo M, Grasso LF, Vitale P, et al. The kidney in acromegaly: renal structure and function in patients with acromegaly during active disease and 1 year after disease remission. *Eur J Endocrinol* 2010;162:1035-42.
7. Krieg RJ Jr, Santos F, Chan JC. Growth hormone, insulin-like growth factor and the kidney. *Kidney Int* 1995;48:321-36.
8. Iglesias P, Díez JJ, Fernández-Reyes MJ,

Méndez J, Bajo MA, Aguilera A, et al. Growth hormone, IGF-1 and its binding proteins (IGFBP-1 and 3) in adult uraemic patients undergoing peritoneal dialysis and haemodialysis. *Clin Endocrinol (Oxf)* 2004;60:741-9.

9. Caufriez A, Abramowicz D, Vanherweghem JL, Copinschi G. Insulin-like growth factor I values in patients on maintenance haemodialysis: relationship to growth hormone and albumin levels. *J Endocrinol Invest* 1993;16:691-6.
10. Kagan A, Zadik Z, Gertler A, Ulman M, Bar-Khayim Y. Serum concentrations and peritoneal loss of growth hormone and growth-hormone-binding protein activity in older adults undergoing continuous ambulatory peritoneal dialysis: comparison with haemodialysis patients and normal subjects. *Nephrol Dial Transplant* 1993;8:352-6.

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Residual renal function in patients on peritoneal dialysis: effect of peritonitis episodes

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To the Editor,

Residual renal function (RRF) has prognostic value in patients treated