Clin Kidney J (2012) 5: 474–475
doi: 10.1093/ckj/sfs121

CKJ

Nephroquiz
(Section Editor: M. G. Zeier)

Night blindness in a haemodialysed ADPKD patient receiving octreotide

Thien Anh Ho[1], Pierre-Yves Decleire[2], Jean-Jacques Lafontaine[2] and Yves Pirson[1]

[1]Division of Nephrology, Cliniques Universitaires Saint-Luc, Université Catholique de Louvain Medical School, Brussels, Belgium and [2]Division of Nephrology, Cliniques du Sud Luxembourg, Arlon, Belgium

Correspondence and offprint requests to: Thien Anh Ho; E-mail: thien.ho@uclouvain.be

Keywords: ADPKD; octreotide; polycystic liver disease

Case

A 62-year-old woman on chronic haemodialysis since November 2008 for end-stage renal disease (ESRD) due to autosomal dominant polycystic kidney disease (ADPKD) had developed a massive polycystic liver (10.647 mL), causing severe abdominal discomfort, early satiety, dyspepsia and dyspnoea (Figure 1). On the basis of the demonstrated effectiveness of somatostatin analogues in reducing the liver volume in ADPKD patients [1, 2] and taking into account her reluctance for any liver surgery, we offered her a trial treatment with octreotide.

We administered a single-test dose of short-acting subcutaneous 100 µg octreotide and observed the patient over a 24-h period. Diarrhoea, vomiting and abdominal cramps occurred several hours after administration, but disappeared the day after. We then started long-acting octreotide treatment at a monthly dose of 20 mg. A few hours after the injection, the patient suffered from diarrhoea, nausea and vomiting. While nausea and vomiting rapidly resolved, diarrhoea persisted over the whole next month. Thus, the monthly dose of octreotide was reduced to 10 mg.

After 3 months of treatment, diarrhoea persisted with fatty and discoloured stools. At the same time, the patient began to report loss of nocturnal peripheral vision. She explained that, in the dark, her visual field was restricted, giving her the feeling of seeing 'like in a tunnel'.

What was the cause of night blindness reported by this patient?

The diagnosis

Night blindness, also called nyctalopia, is the inability to see correctly at night or in poor light. The two most common causes of night blindness are retinitis pigmentosa and vitamin A deficiency. Vitamin A and β-carotene serum levels were markedly lowered in our patient: we found a vitamin A level of 277 µg/L (normal value 300–800) and a β-carotene level of 7 µg/L (normal value 200–350). This severe deficiency was very likely to result from vitamin A malabsorption in relation to chronic steatorrhea, a known side effect of somatostatin analogs. Octreotide was stopped: diarrhea resolved over 2 months and the visual defect concomitantly recovered, while vitamin A levels returned to normal values, without other therapeutic maneuvre. This patient is now registered on a waiting list for a combined liver and kidney transplantation.

The two available somatostatin analogs are long-acting lanreotide and octreotide. In animal models of polycystic disease, somatostatin analogs were shown to inhibit fluid secretion and cell proliferation in liver cysts trough downregulation of cAMP (cyclic adenosine monophosphate) production in the cholangiocyte, and

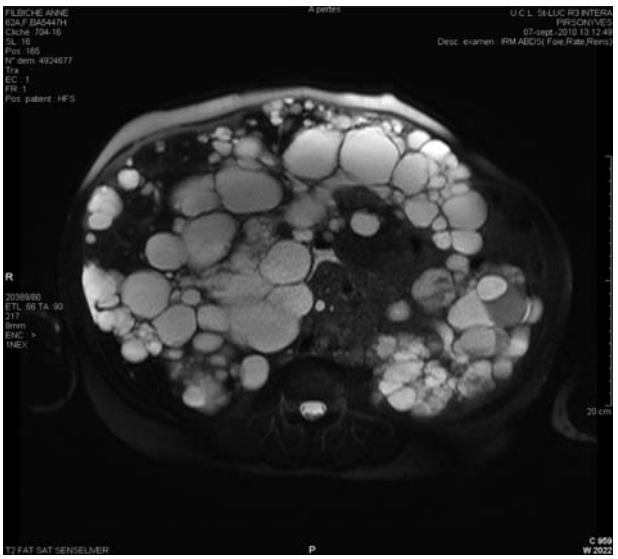

Fig. 1. Non-enhanced abdominal computed tomography. Massive cystic enlargement of the liver, occupying a large part of the abdomen and responsible for severe abdominal distension. The left polycystic kidney is also visible.

significantly reduce liver cyst growth [3]. Two randomized placebo-controlled clinical trials demonstrated the effectiveness of lanreotide [1] and octreotide [2] for slowing the progression of polycystic liver disease associated with either ADPKD or ADPLD (autosomal dominant-isolated polycystic liver disease).

Although diarrhoea was reported in ∼60% of the 55 patients receiving octreotide or lanreotide in the two above-mentioned trials, steatorrhoea developed in only one of them [1]. The early and severe steatorrhoea in our patient might have been facilitated by ESRD, a characteristic which was absent in the previous trials (estimated glomerular filtration rate >20 mL/min/1.73 m^2). There is actually very little information in the literature about the pharmacokinetics of somatostatin analogues in ESRD. The only published study analysed the behaviour of lanreotide, administered as a single intravenous bolus of 7 µg/kg in 12 haemodialysis patients and 12 healthy subjects [4]. A 50% reduction of serum lanreotide clearance was found in haemodialysis patients. This suggests a role for the kidney in the metabolization of the drug and would argue for a dose reduction in ESRD patients. In our patient, decreasing the dose up to one-fourth of that used in the Mayo Clinic trial (40 mg)[2] was, however, not sufficient to arrest steatorrhoea.

Whatever the cause of the particular sensitivity of our patient to this complication, an awareness of its potential severity is the main lesson of this case. Pancreatic enzyme supplementation could be a therapeutic option to attenuate steatorrhoea in this setting. Pharmacokinetic exploration of the long-acting formulation of somatostatin analogues in patients with chronic renal failure would be most helpful to clarify future indications of this new treatment of massive polycystic liver disease.

References

1. Van Keimpema L, Nevens F, Vanslembrouck R *et al*. Lanreotide reduces the volume of polycystic liver: a randomized, double-blind, placebo-controlled trial. *Gastroenterology* 2009; 137: 1661–1668
2. Hogan MC, Masyuk TV, Page LJ *et al*. Randomized clinical trial of long-acting somatostatin for autosomal dominant polycystic kidney and liver disease. *J Am Soc Nephrol* 2010; 21: 1052–1061
3. Masyuk TV, Masyuk AI, Torres VE *et al*. Octreotide inhibits hepatic cystogenesis in a rodent model of polycystic liver disease by reducing cholangiocyte adenosine 3′,5′-cyclic monophosphate. *Gastroenterology* 2007; 132: 1104–1116
4. Barbanoj M, Antonijoan R, Morte A *et al*. Pharmacokinetics of the somatostatinanaloglanreotide in patients with severe chronic renal insufficiency. *Clin Pharmacol Ther* 1999; 66: 485–491

Received for publication: 27.7.2012; Accepted in revised form: 30.7.2012