

Renal denervation as therapy for kidney related pain in patients with chronic kidney disease.

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Introduction

Autosomal dominant polycystic disease (ADPKD) and loin pain hematuria syndrome (LPHS) are the most important non-urological conditions to cause chronic kidney disease (CKD)-related pain. In ADPKD this pain is due to capsular elongation by renal cysts. In LPHS the pain is caused by tubular obstruction with erythrocytes and/or microcrystals.

Surgical methods, like renal auto transplantation or laparoscopic renal denervation (RDN) have proven to be effective in relieving the pain, but are invasive and therefore associated with considerable complication risk. Percutaneous catheter-based RDN is currently a feasible, less invasive, option for treating kidney-related chronic pain in CKD, as most of the nerve fibers, are located around the renal arteries.

Methods

Our primary outcome in this pilot study was defined as change in pain perception and use of pain medication 6 months after percutaneous RDN. Pain perception was assessed with the maximal Visual Analog Score (VASmax). Data are expressed as mean (SD) or median (interquartiles), if applicable. P-value represents the difference from baseline to 3 or 6 months follow-up.

Baseline characteristics	Total group (n=11)
Age (years)	40 (±9)
Gender male (n)	2
Hypertension (n)	5
(Cardio)vascular diseases (n)	1
Pain duration (years)	2.5 (0.75-6.0)
Office blood pressure	
Systolic mmHg	130 (±21)
Diastolic mmHg	80 (±13)
Heart rate bpm	77 (±11)
Nr. of classes antihypertensive medication	1.0 (0.0-3.0)
eGFR, CKD epi ml/min/1.73m ²	90 (±37)

Change in pain perception and pain medication use in total group					
	Baseline	3 months (n=10)	P-value	6 months (n=9)	P-value
Maximal Visual Analog Score (mm)	82 (70-92)	68 (55-79)	0.04	61 (34-66)	0.03
Nr. of classes pain medication	2.0 (2.0-3.0)	1.5 (0.8-2.3)	0.03	2.0 (0.0-2.3)	0.02
Daily defined use of pain medication	1.4 (0.4-2.1)	0.6 (0.3-1.4)	0.02	0.4 (0.0-1.2)	0.04

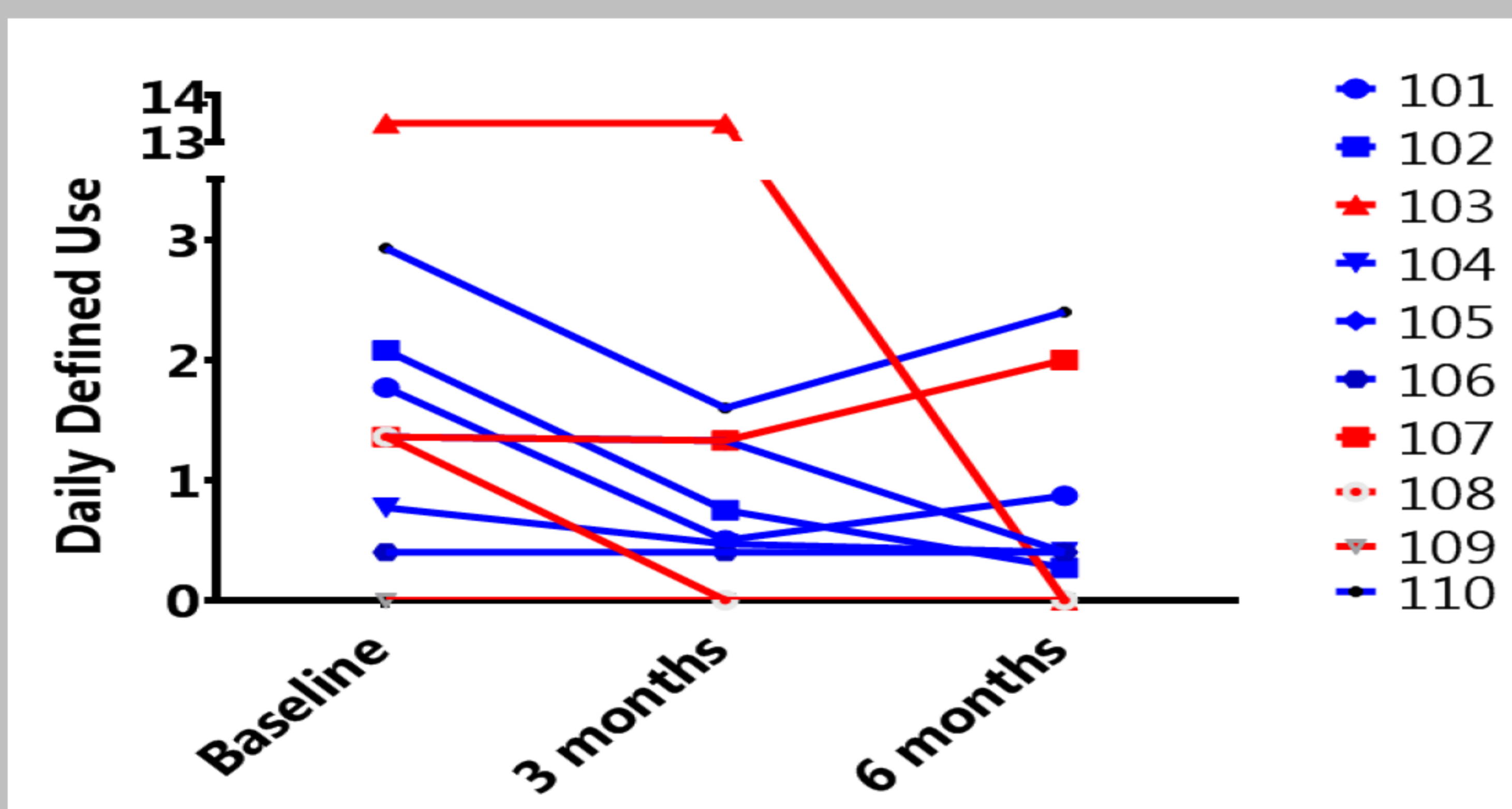


Figure 1A. Daily Defined Use at baseline, 3 and 6 months per individual patient.

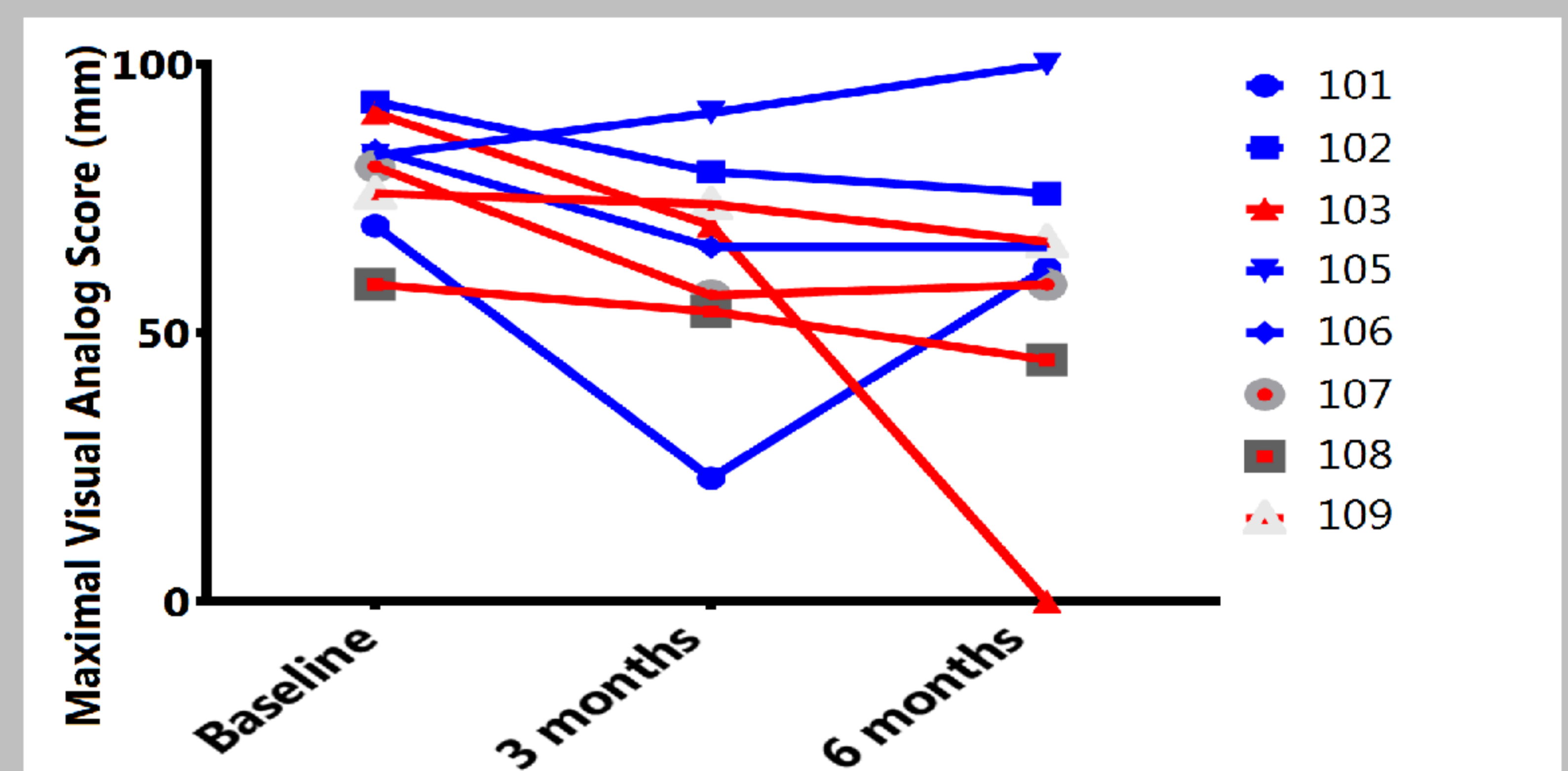


Figure 1B. Maximal Visual Analog Score (VASmax) at baseline, 3 and 6 months per individual patient.

Discussion

This explorative study suggests a beneficial effect of percutaneous renal denervation (RDN) on pain perception and the use of pain medication in patients with CKD-related pain. Noteworthy, despite the fact that the patient used less pain medication per day, pain perception continued to decrease overtime. We underline the importance of a stepwise program, in which the first steps include a psychological evaluation and pain medication, as these methods are less invasive than percutaneous renal denervation. Therefore, Casteleijn et al* proposed a stepwise program, where the next step, after celiac blockade, is percutaneous RDN. At present RDN is also extensively performed to treat uncontrolled hypertension. It is of an upmost interest to treat patients with ADPKD that experience pain and have high blood pressure (BP). Especially, since in our study all patients with ADPKD were hypertensive and BP and number of antihypertensive medication decreased after RDN (data not shown).

Conclusion

This pilot study suggests that percutaneous catheter based RDN has a beneficial effect on pain perception and the use of pain medication in patients with ADPKD and LPHS kidney-related chronic pain.

* Casteleijn NF, Visser FW, Drenth JP et al. A stepwise approach for effective management of chronic pain in autosomal-dominant polycystic kidney disease. *Nephrol Dial Transplant* 2014; 29 Suppl 4: iv142-iv153