

# The association of combined total kidney liver volume with pain and gastrointestinal symptoms in patients with later stage ADPKD

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## Introduction

- Pain and gastrointestinal (GI) symptoms are common in ADPKD, especially in women. The literature is ambiguous whether kidney or liver volume is associated with these symptoms
- Since both kidney and liver volume determine intra-abdominal volume, it may be reasonable that combined volumes are associated with symptom burden

## Objectives

- To investigate whether the association of combined total kidney liver volume with pain and GI symptoms is stronger than the associations between symptoms and the volume of the separate organs
- To explore whether sex interacts with this association

## Methods

- Cross-sectional analysis of the baseline data of the DIPAK-1 study, a multi center RCT in ADPKD patients with an eGFR between 30-60 mL/min/1.73m<sup>2</sup> and age 18-60 years, in the Netherlands
- Height adjusted total kidney volume (hTKV), total liver volume (hTLV) and combined kidney liver volume (hTKLV) were measured by MRI
- ADPKD-related pain was assessed as a composite score of >2 (scale 1-10) for either renal or liver pain
- GI symptoms as a GI sum score (sum score of 11 GI items (scale 1-7) converted to scale 0-100)

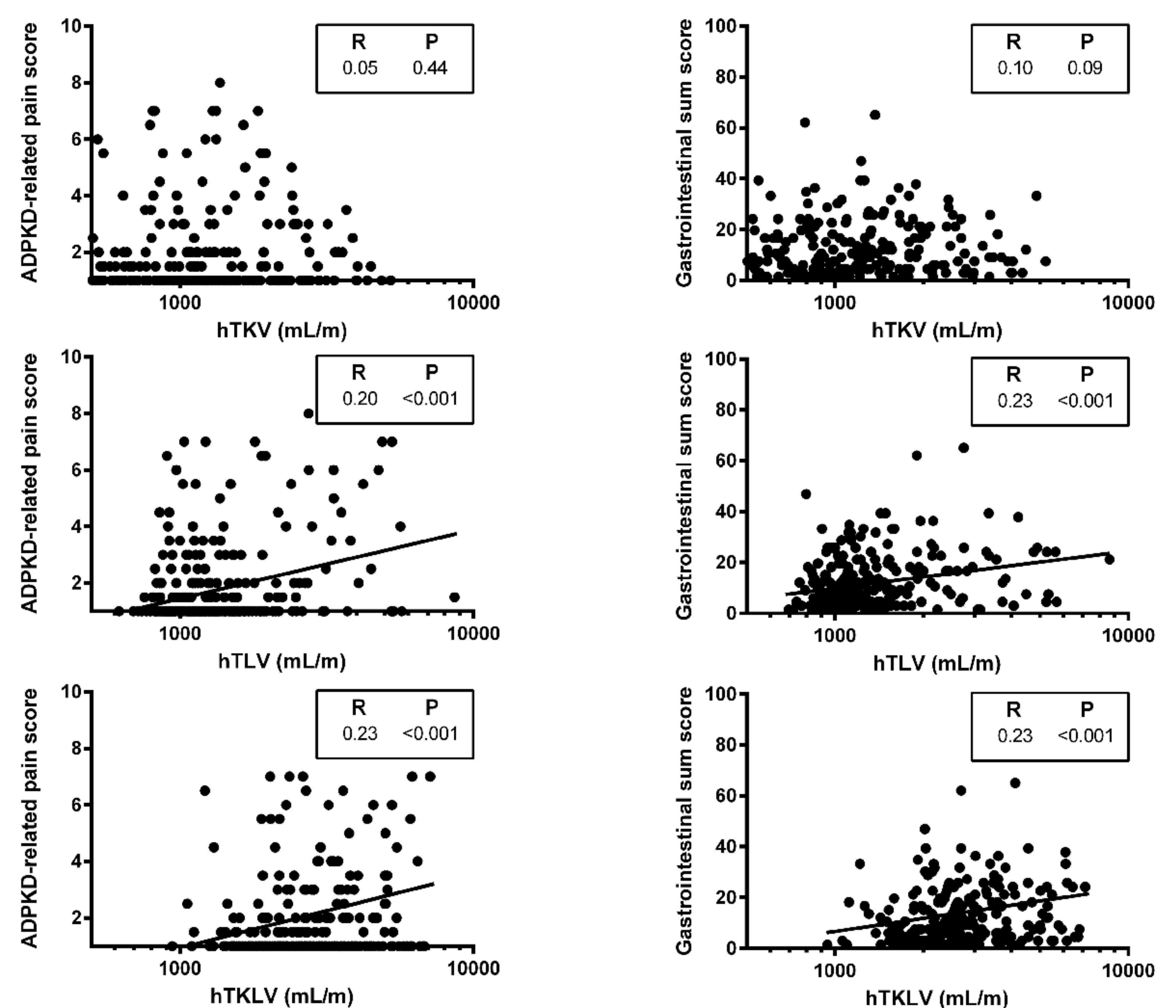
## Conclusions

- Combined total kidney liver volume was associated with pain and GI symptoms in ADPKD, with a more prominent role for liver volume
- Symptom burden was more prevalent in females compared to males, although sex was no effect modifier in the relation between organ volume and symptoms
- Physicians should be aware of the role of liver volume in symptomatic ADPKD and volume reducing therapies should especially target the liver

## Baseline characteristics

	Presence of ADPKD-related pain		P-value
	Yes (n=85)	No (n=224)	
Age (y)	48 ± 7	48 ± 7	0.6
Female (%)	65.9	48.8	0.006
Height (m)	1.75 ± 0.1	1.77 ± 0.1	0.05
Weight (kg)	82 ± 16	85 ± 17	0.3
Systolic blood pressure (mmHg)	134 ± 13	132 ± 14	0.4
Diastolic blood pressure (mmHg)	85 ± 10	81 ± 10	0.1
History of			
- Renal pain (%)	82.4	34.2	<0.001
- Liver pain (%)	31.8	4.6	<0.001
- Urinary tract infection (%)	61.2	42.5	0.003
- Macroscopic hematuria (%)	47.1	26.9	0.001
Presence of liver cysts (%)	100	92.6	0.01
eGFR (mL/min/1.73m <sup>2</sup> )	49 ± 11	50 ± 11	0.4
hTKV (L/m)	1.19 (0.81 – 1.87)	1.06 (0.72 – 1.65)	0.3
hTLV (L/m)	1.35 (1.08 – 2.44)	1.15 (0.99 – 1.42)	<0.001
hTKLV (L/m)	2.98 (2.19 – 3.92)	2.39 (1.93 – 3.03)	<0.001

## hTKV, hTLV, hTKLV vs. pain and GI symptoms



## Model testing organ volume vs. symptoms

- The hTKLV model was more strongly associated with pain and GI symptoms than the hTKV model (Pain: p=0.04; GI symptoms p=0.04), but not better than the hTLV model (Pain: p=0.2; GI symptoms p=0.5)

## Sex vs. pain and GI symptoms

	Female (n=163)	Men (n=146)	P-value
History of ADPKD-related pain (%)	55.8	45.2	0.06
Presence of ADPKD-related pain (%)	34.4	19.9	0.006
Severity of ADPKD-related pain (%)	5.0 (3.0 – 7.0)	4.0 (3.0 – 6.0)	0.2
Gastrointestinal sum score (0-100)	17.6 (15.2 – 23.1)	9.0 (4.5 – 16.7)	<0.001
hTKV (L/m)	0.92 (0.60 – 1.33)	1.31 (0.94 – 2.14)	<0.001
hTLV (L/m)	1.25 (1.03 – 1.90)	1.13 (0.97 – 1.34)	<0.001
hTKLV (L/m)	2.42 (1.94 – 3.21)	2.54 (2.06 – 3.55)	0.2

