

High sensitivity Troponins; 3-month variation in Hemodialysis and Peritoneal dialysis patients

Sunna Snaedal MD^{1,2}, Peter Bárány MD, PhD¹, Abdul R. Qureshi MD, PhD³, Olof Heimbürger MD, PhD¹, Peter Stenvinkel MD, PhD¹, Christian Löwbeer MD, PhD^{4,5}, Karolina Szummer MD, PhD⁶

¹Division of Renal Medicine, Dpt of Clinical Science, Intervention and Technology, Karolinska Institutet, Stockholm, Sweden, ²Landspítali University Hospital, Reykjavik, Iceland, ³Department of Baxter Novum, Karolinska Institutet, Stockholm, Sweden, ⁴Division of Clinical Chemistry, Department of Laboratory Medicine, Karolinska Institutet, Stockholm, Sweden and ⁵Department of Clinical Chemistry, Aleris Medilab, Täby, Sweden, ⁶Department of Cardiology, Karolinska Institutet, Stockholm, Sweden

Conclusions

- According to RCV analyses a rise in cTnI by >125% or fall by >56% indicates a clinically significant change in dialysis patients
- According to RCV analyses a rise in cTnT by >51% or fall by >34% indicates a clinically significant change in dialysis patients
- cTnT is above the decision limit for MI 96-98% of the time in clinically stable HD and PD patients
- cTnI is above the decision limit for MI 35-44% of the time in clinically stable HD and PD patients

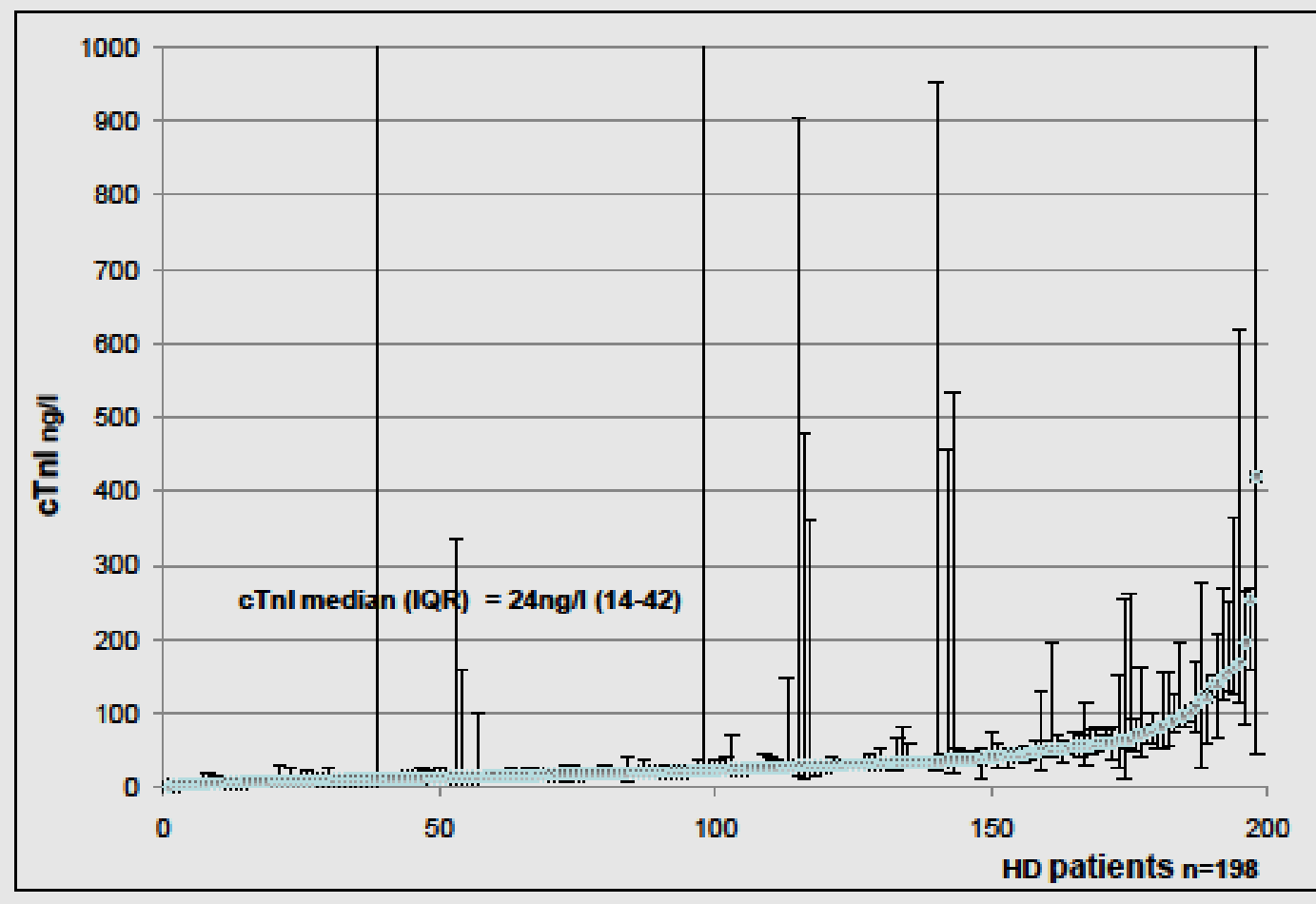


Figure 1a) Individual cTnI median and range of cTnI during 3 months; HD patients

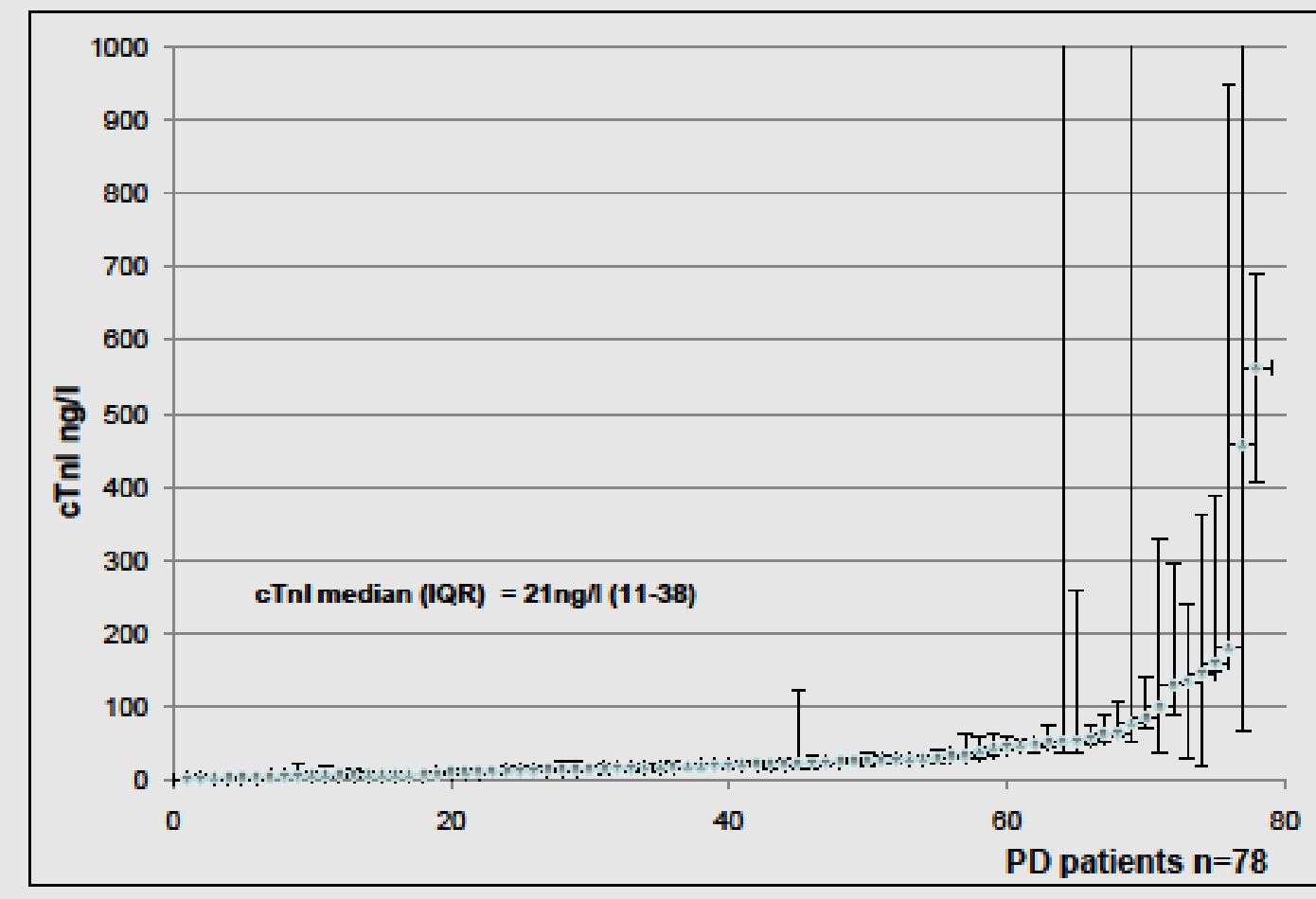


Figure 1b) Individual cTnI median and range of cTnI during 3 months; PD patients

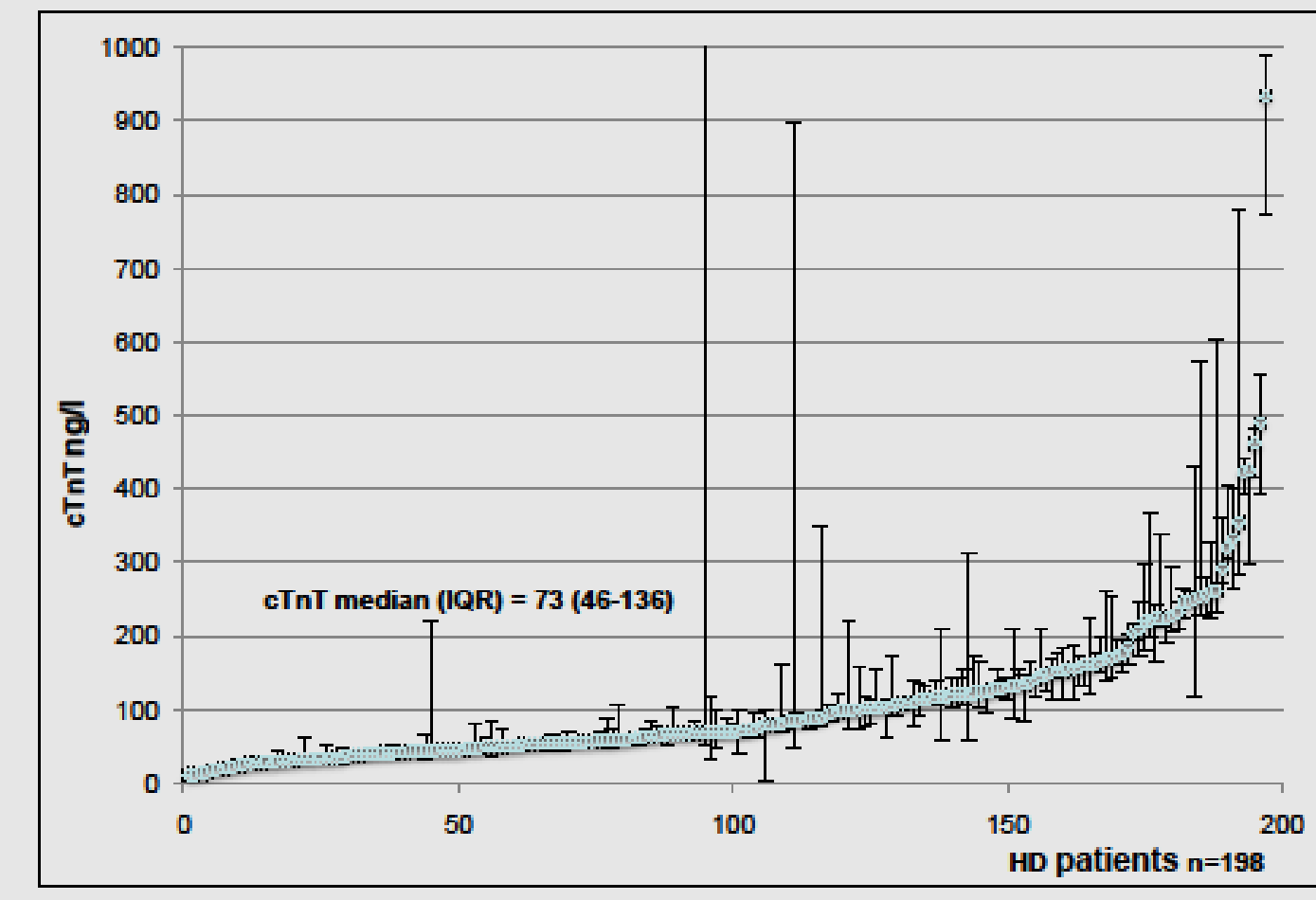


Figure 1c) Individual cTnT median and range of cTnT during 3 months; HD patients

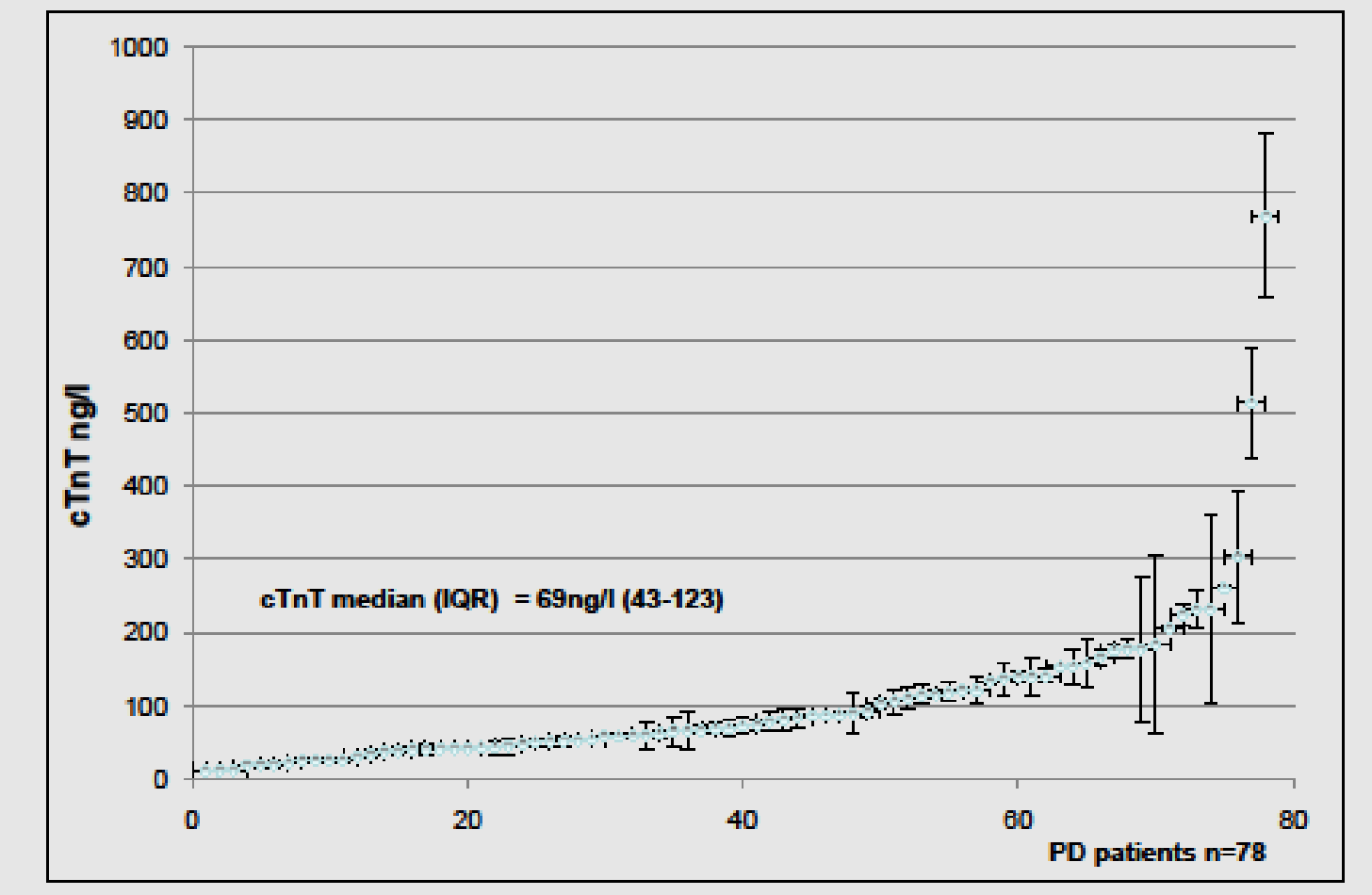


Figure 1d) Individual cTnT median and range of cTnT during 3 months; PD patients

Introduction

- Troponin levels are chronically elevated in patients (pts) on dialysis even without signs of myocardial ischemia. There is lack of data on the levels and variability of troponin T and I levels in dialysis pts.
- We aimed to determine the normal variability of high sensitivity troponins in prevalent hemodialysis (HD) and peritoneal dialysis (PD) pts.

Table 1. Clinical characteristics and biomarkers at baseline in hemodialysis and peritoneal dialysis patients

	HD n=198	PD n=78	p-value
Age, years	66 (51-74)	64 (56-77)	0.59
Sex, % men	57	67	0.1
BMI, kg/m ²	24 (21-27)	25 (23-28)	0.05
Smoking no/yes, %	81/19	79/21	0.78
PEW (SGA>1), %	45	39	0.42
Time on dialysis, months	28 (15-54)	11 (6-29)	<0.001
Comorbidity, low/medium/high, %	21/55/24	27/56/17	0.14
Ischemic heart disease, %	31	30	0.9
Congestive heart failure, %	22	15	0.23
Diabetes mellitus, %	25	23	0.78
Albumin, g/L	35 (33-38)	32 (28-35)	<0.001
hs-CRP, mg/L	6.2 (2.5-18.8)	4.7 (1.5-11.4)	0.05
NT-proBNP, ng/L	9,724 (2,969-26,571)	3,045 (1,173-8,615)	<0.001
hs-cTnI, ng/L	25 (14-43)	21 (11-37)	0.16
hs-cTnT, ng/L	70 (44-129)	67 (43-123)	0.41

Data expressed as median values (IQR)
BMI, body mass index; HD, hemodialysis; PD, peritoneal dialysis; PEW, protein energy wasting; SGA, subjective global assessment

Methods

- 198 HD and 78 PD pts from Stockholm, Sweden followed for 3 months. Prevalent patients without intercurrent cardiovascular events.
- High sensitivity troponin T (cTnT) and high sensitivity troponin I (cTnI) measured at 0, 4, 8 and 12 weeks.
- cTnT - level of detection \geq 5ng/L (Roche Diagnostics Cobas E411 Analyzer).
- cTnI - level of detection \geq 2 ng/L (Abbott Diagnostics Architect i4000SR Analyzer).
- Information on comorbidity and clinical characteristics gathered at study start.

Table 2. Variation in high sensitivity Troponin I and T in hemodialysis and peritoneal dialysis patients

	HD n=198	PD n=78	All n=276
hs-cTnI			
RCV log-normal (rise/fall), %	125/-56	125/-56	125/-56
Range, ng/l	1-4,057	2-1,764	1-4,057
% above reference value for myocardial infarction (Values >27 ng/l)	44	35	42
Limit of 99th percentile, ng/l	495	946	661
CV _i , %	28.8	28.9	28.8
CV _g , %	312.2	248.3	304.3
Index of individuality	0.10	0.12	0.10
hs-cTnT			
RCV log-normal (rise/fall), %	51/-34	51/-34	51/-34
Range, ng/L	4-1,961	12-1,008	4-1,961
% above reference value for myocardial infarction (Values >14 ng/l)	98	96	98
Limit of 99th percentile, ng/l	901	829	900
CV _i , %	14.5	14.4	14.4
CV _g , %	146.3	122.6	127.45
Index of individuality	0.10	0.12	0.12

CV_i, coefficient of variation by individual; CV_g, coefficient of variation by group; HD, hemodialysis; hs-cTnI, high sensitive cardiac Troponin I; hs-cTnT, high sensitive cardiac Troponin T; IQR, interquartile range; PD, peritoneal dialysis; RCV, reference change value; SD, standard deviation

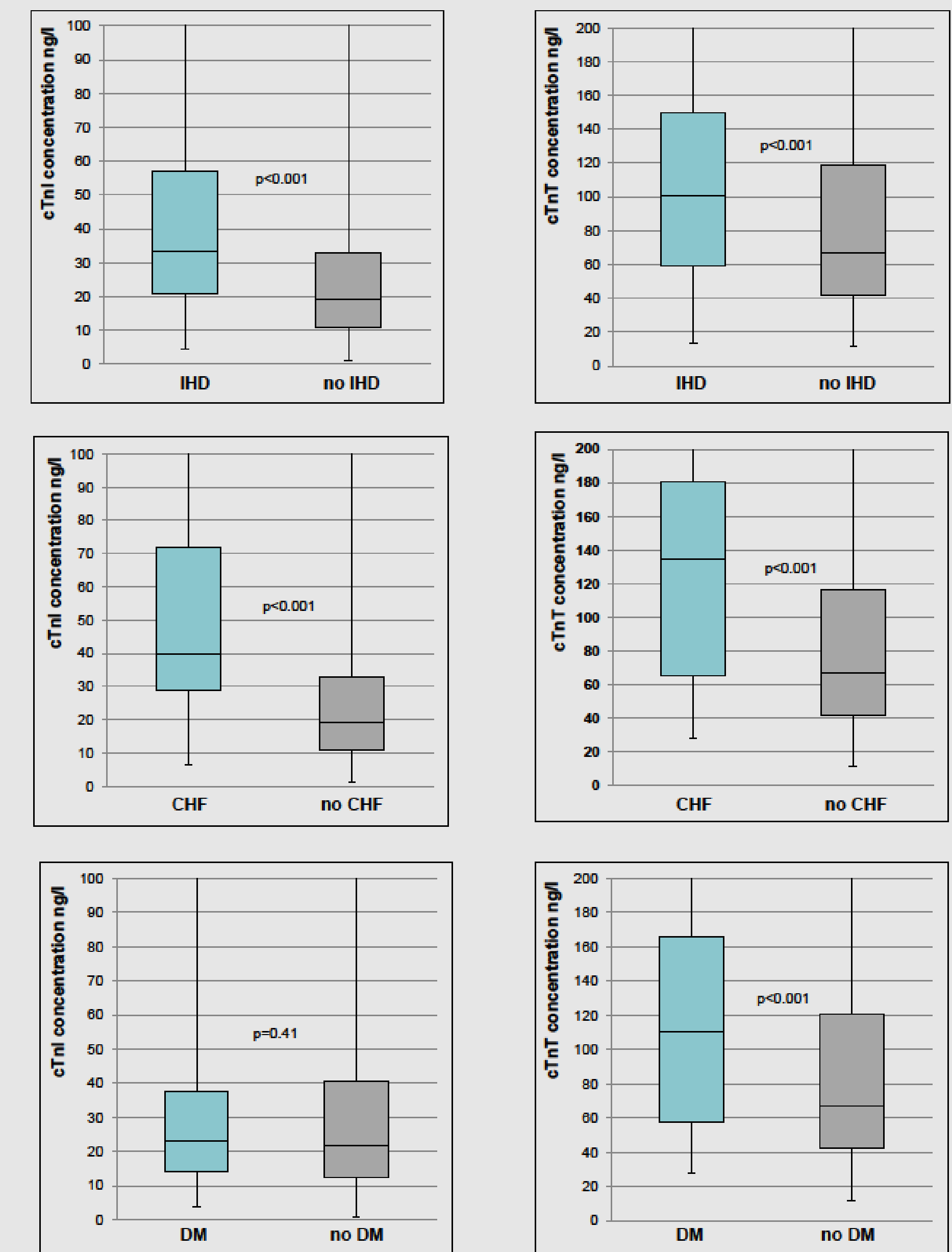


Figure 2. cTnI and cTnT in HD and PD patients (n=276) with and without ischemic heart disease (IHD), congestive heart failure (CHF) and diabetes (DM)

Sunna Snaedal
MD • CLINTEC Karolinska Institutet, Stockholm, Sweden
& Nephrology dpt, Landspítali University Hospital, Reykjavik, Iceland
E-mail: sunna.snaedal-jonsdottir@ki.se Telephone: +354 7798221



Karolinska
Institutet

