

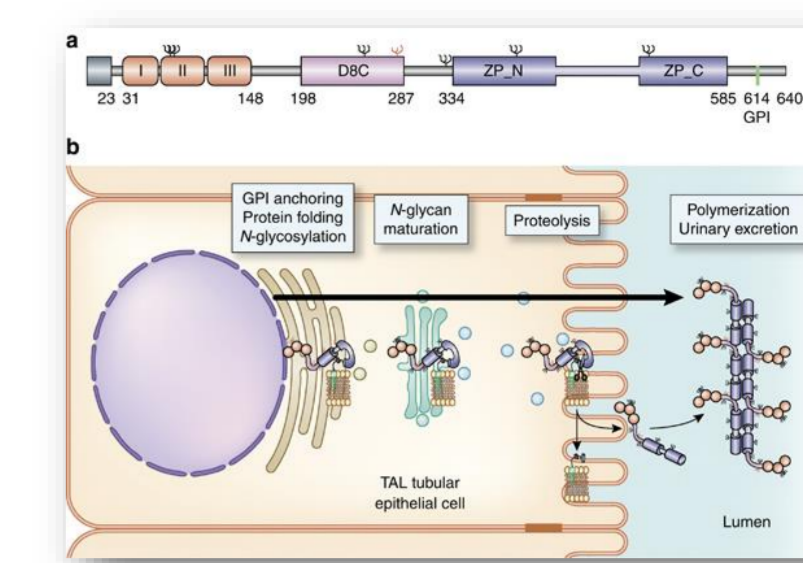
IS THERE ANY IMPORTANCE TO DETERMINE UROMODULIN SERUM CONCENTRATION IN PATIENTS WITH LONG TERM DIABETES MELLITUS TYPE 2

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INTRODUCTION:

- Uromodulin or Tamm-Horsfall protein is 95kDa glycoprotein produced in the kidney by thick ascending limb of the loop of Henle.
- Although the physiological role of uromodulin is not clearly defined, there is a growing interest in determining this glycoprotein in serum and urine of patients with acute and chronic renal failure as a marker of renal function.
- The aim of the study was to evaluate uromodulin serum concentration in patients with long term typ 2 diabetes mellitus (T2DM).



METHODS:

- The study included 50 patients with T2DM mean age 50.8±15.1 years and 20 healthy controls. We determined the demographic characteristics of the patients, BMI; biochemical analyses: serum concentration of haemoglobin, urea, creatinine, microalbuminuria.
- Serum uromodulin was measured by ELISA method- test Euroimmun.
- The cystatin C level was determined by immunonephelometric method commercially test N Latex Cystatin C using nephelometer BN II System Assays (Siemens Healthcare).
- The glomerular filtration rate (eGFR) was calculated according to formulas:
 - Cockcroft Gault GFR = $[(140 - \text{age}) \times \text{body weight}] / (72 \times \text{serum creatinine}) \times 0.85$ (correction factor for female)
 - MDRD (Modification of Diet in Renal Disease) GFR (mL/min/1.73 m²) = $175 \times (\text{serum creatinin})^{-1.154} \times (\text{age})^{-0.203} \times (0.742 \text{ correction factor for female})$
 - Simple Cystatin C GFR = $100 / \text{serum Cystatin C}$
 - CKD - EPI (Chronic Kidney Disease Epidemiology Collaboration equation) GFR = $141 \times \min(S_{Cr}/k, 1)^a \times \max(S_{Cr}/k, 1)^{-1.209} \times 0.993^{a9e} \times 1.018 [\text{female}] \times 1.159 [\text{black}]$

RESULTS:

- The cross section study included 50 patients with T2DM: 18 males and 32 females and 20 healthy controls: 9 males and 11 females.
- Duration of T2DM was 10.4 ± 5.7 years (from 5 - 30 years).
- Glomerular filtration rate eGFR was 114.38±22.1ml/ min and microalbuminuria was 65.01±34.02 mg/l.

Table 1

	BMI (kg/ m ²)	Haemoglobin (g/L)	Creatinine (μmol/L)	CystatinC (mg/L)	Uromodulin (ng/ ml)
T2DM	31.27±5.59	133,86±13,08	71,60±13.59	0,96± 0,22	136,51± 84,34
Control group	24.44±4.13	146,45±15,42	71,25±13,89	0,78± 0,08	220,50± 92,39
Significance	p<0.01	p<0.01	p>0.01	p<0.01	p<0.01

Table 2

	Cockcroft Gault (ml/min)	MDRD (ml/min/1.73m ²)	Simple Cystatin C (mg/L)	CKD- EPI (ml/min)
T2DM	109,13± 36,99	88,91± 19,75	108,73± 21,26	85,77± 15,78
Control group	132,96± 39,5	105,44± 20,47	128,71±13,34	108,60±16,12
Significance	p<0.01	p<0.01	p<0.01	p<0.01

- Table 3 shows that we found a significant positive correlation between uromodulin and MDRD, simple Cystatin C and CKD EPI; but significant negative correlation between uromodulin and age, BMI and Cystatin C.

Table 3

Variable	Coeffitient Correlation (r)	Significance (p)
Age	-0.424	0.000
BMI	-0.363	0.002
MDRD	0.297	0.006
Cystatin C	-0.226	0.010
Simple Cystatin C	0.250	0.020
CKD- EPI	0.367	0.002

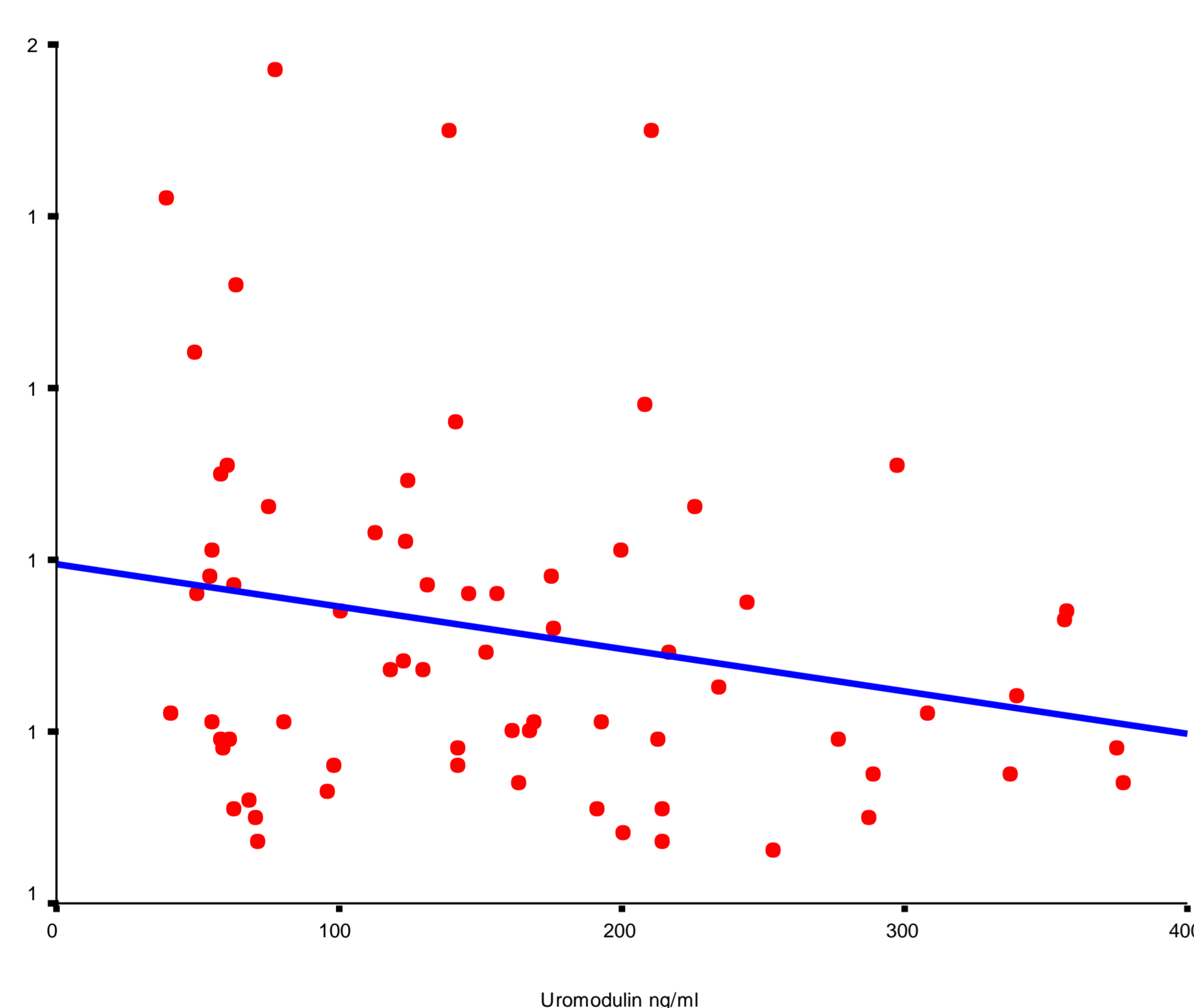


Figure 1 Correlation between serum concentration uromodulin and Cystatin C

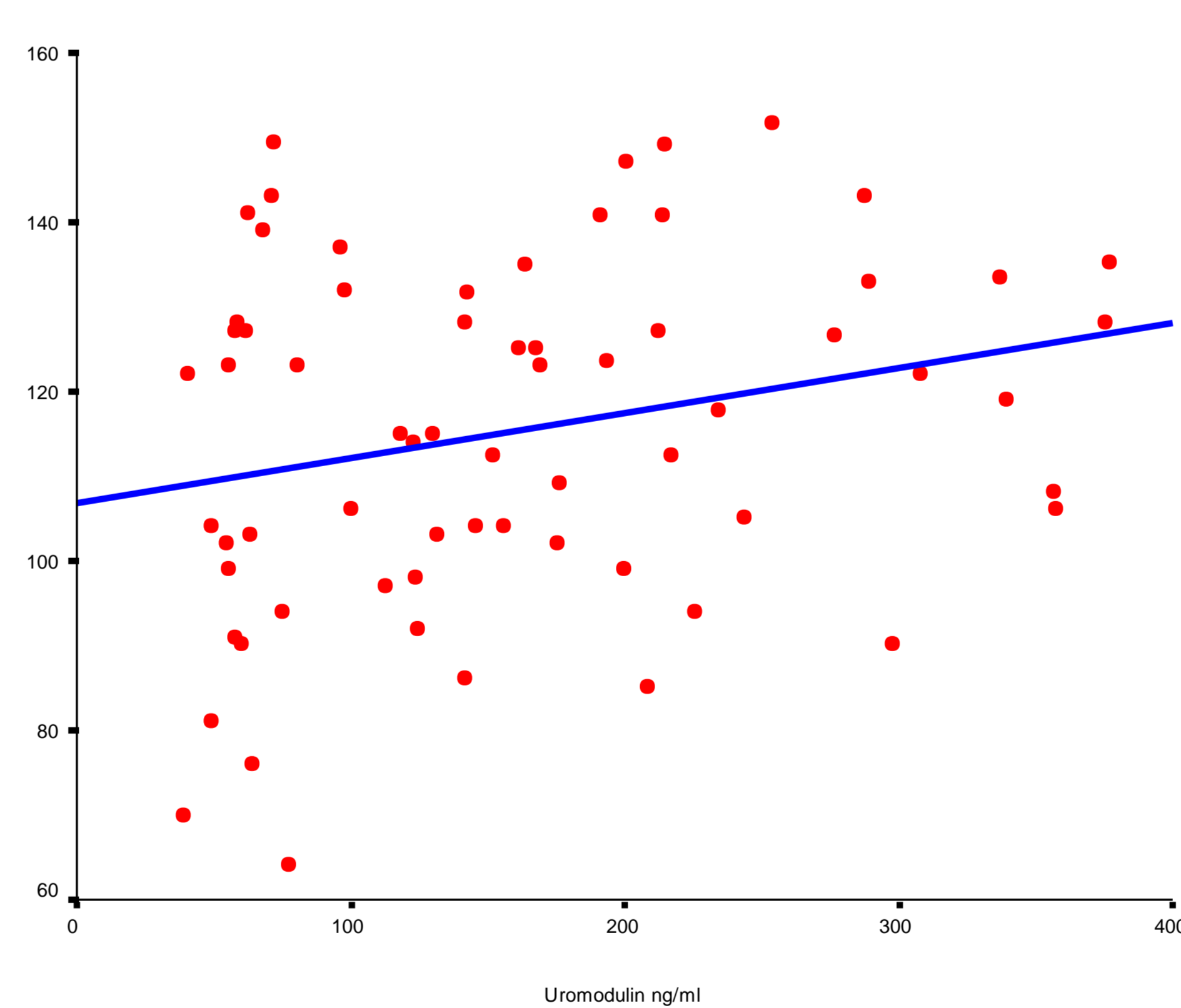


Figure 2 Correlation between serum concentration uromodulin and simple Cystatin C

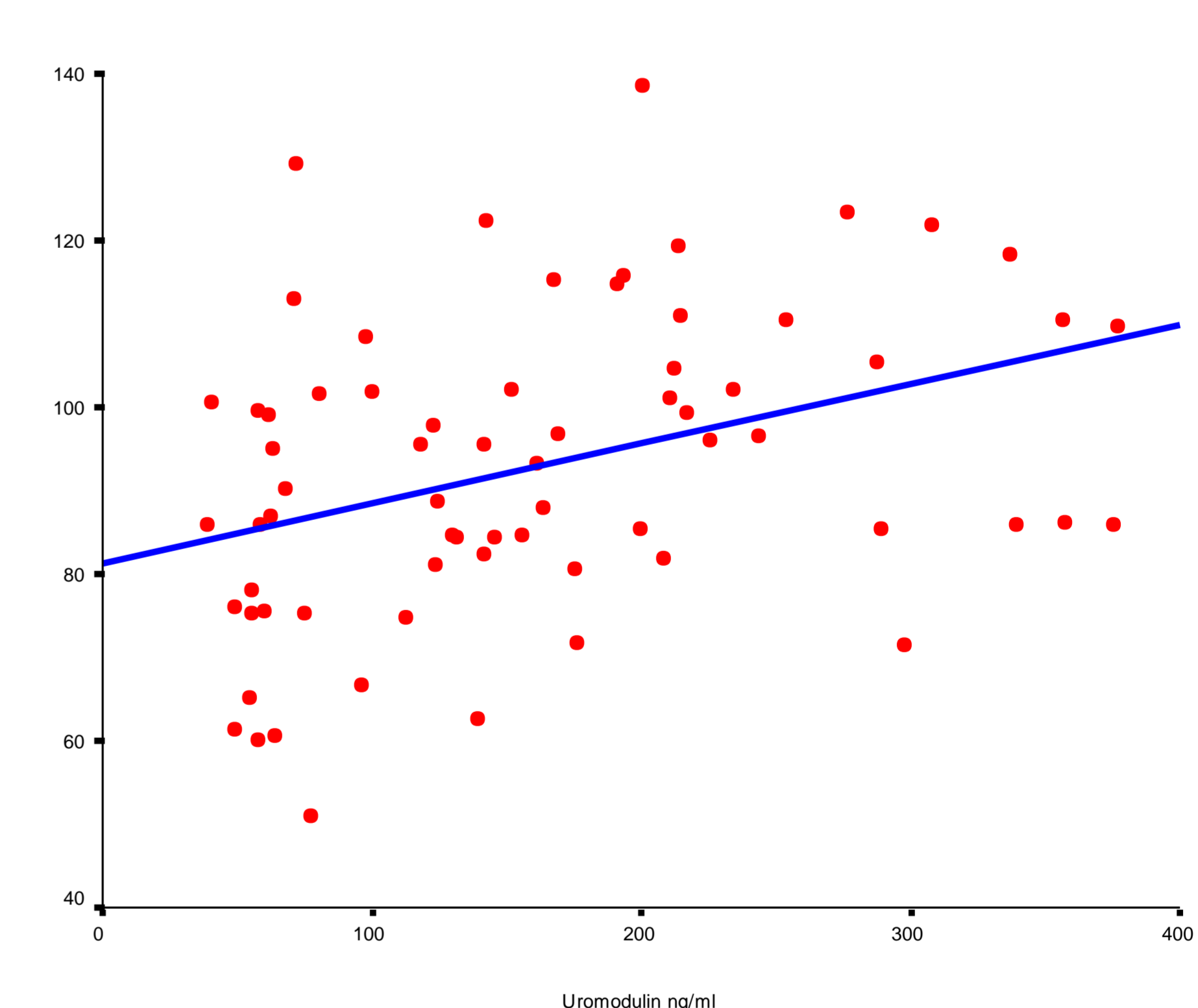


Figure 3 Correlation between serum concentration uromodulin and GFR CKD-EPI

CONCLUSION:

- In the past few decades, serum creatinine has become the most commonly used marker of glomerular filtration rate and it is calculated with the following formulas: MDRD, Cockcroft Gault, CKD- EPI.
- Our results indicate that a higher serum uromodulin concentration is associated with better kidney function. Uromodulin increases with an increase in kidney function and behaves in a manner opposite to the conventional kidney function markers, which increases because of the retention due to decreased kidney function.
- Even though the role of serum uromodulin concentration is not established yet, it could be speculated that reduced serum concentration indicated early kidney damage in patients with long term T2DM.
- The study should be repeated on a larger group of patients.

LITERATURE:

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