Correction to: Novel biomarkers of diabetic kidney disease: current status and potential clinical application

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Authors would like to update the incorrect reference in Table 1. For instance number 8 is number 11; number 9 is 12; number 10 is 13.....

The original article has been corrected.

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The original article can be found online at <https://doi.org/10.1007/s00592-020-01656-9>.

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Table 1. Main studies on biomarkers and DKD

Biomarker	Type of DM	n	Baseline Characteristics	FU (yrs)	Biofluid	Outcomes	Main Results HR (95% CI),	Adjustments	Ref
TNFR1/R2	T2	410	eGFR >30 – N, Mi, Ma	12	Plasma	Progression to ESRD	TNFR1: HR 4.7 (1.3–17.0) TNFR2: HR 2.2 (0.7–6.4)	HbA1c, AER, eGFR	[11]
TNFR1/R2	T2	193	m-GFR ≥60 (89%) – N, Mi, Ma	9.5	Serum	Progression to ESRD	TNFR1: HR 1.6 (1.1–2.2) TNFR2: HR 1.7 (1.2–2.3)	Age, gender, HbA1c, BP, m-GFR, ACR	[12]
TNFR2	T1	349	eGFR >30 Ma	7	Serum	Time to ESRD	-34.6% (-39.3, -29.8)	HbA1c, AER, eGFR	[15]
TNFR1	T1	429	Ma	9.4	Plasma	Progression to ESRD	HR: 0.01 (0.00–0.01)*	eGFR, HbA1c, T1DM duration	[14]
TNFR1	T2	194 T2 259 No-DM	eGFR >15	3	Serum	≥30% eGFR decline, RRT, renal death	T2DM: 3.8 (1.1–12.8) No-DM: 0.2 (0.03–1.0)	Age, sex, eGFR, ACR	[13]
TNFR1/R2	T1	628	eGFR >60 – N and Mi	12	Serum	Stage 3 CKD	TNFR1: 2.5 (1.4–4.7) TNFR2: 3.0 (1.7–5.5)	HbA1c, AER, eGFR	[17]
TNFR1/R2	T1	534	eGFR >60 – N and Mi	8	Serum	eGFR loss ≥3.3%/year	OR: 2.9 (1.9–4.5)	Age, UA, BP HbA1c, microalbuminuria	[16]
Uric acid	T1	263	N	18.1	Serum	Ma	HR: 2.9 (1.2–6.8)	HbA1c, BP, AER, serum creatinine and cholesterol	[21]
Uric acid	T1	324	N	6	Serum	Mi or ma	OR: 1.8 (1.2–2.8)	HbA1c, AER	[22]
Uric acid	T1	355	eGFR >60 – High N and Mi	6	Serum	eGFR decline >3.3% per year	HR: 1.4 (1.1–1.8)	Sex, ACR, HbA1c, eGFR	[23]
Uric acid	T2	1449	eGFR >60 without Ma	5	Serum	Incident CKD	HR: 1.20 (1.03–1.57)	Age, sex, BMI, smoking, ΔHbA1c, eGFR, DM duration, ΔBP, AER, TxT	[24]
Uric acid	T1	13964	eGFR >60 – N	4	Serum	(1) eGFR <60 (2) eGFR <60 and Ma	(1) RRR 2.61 (1.98–3.42); (2) RRR 1.54 (1.13–2.09) 5th vs. 1th quartile	Multiple	[25]
Uric acid	T1	3895	N, Mi, and Ma	7	Serum	(1) Albuminuria progression (2) Change of CKD stage: (a) CKD 1/2 → 3/4/5; (b) 1/2/3 → 4/5; (c) 3 → 4/5	(1) NS (2) (a): 2.79 (1.75–4.46) (b): 3.04 (1.92–4.81) (c): 2.23 (1.22–4.08)	Age, sex, BP, TG, HbA1c, DM duration eGFR	[26]
Uric acid	T1	670	N, Mi, and Ma	5–6	Serum	(1) eGFR decline ≥30% (2) CV events (3) Mortality	(1) HR: 3.18 (1.71–5.93) (2) HR: 2.25 (1.20–4.21) (3) HR: 2.58 (1.12–5.90)	Sex, age, BMI, HDL cholesterol, smoking, HbA1c; BP, AER eGFR, TxT	[27]
Copeptin	T2	3101	Mi and Ma	6	Plasma	2 x sCr, ESRD	HR: 2.97 (1.56–6.14) Macro: HR 3.33 (1.37–9.96)	Age, sex, study treatment, AER eGFR	[29]

Table 1. continued

Biomarker	Type of DM	n	Baseline Characteristics	FU (yrs)	Biofluid	Outcomes	Main Results HR (95% CI),	Adjustments	Ref
Copeptin	T1	736	N, Mi, Ma GENEDIAB (n=218) GEN-5 ESIS (n=518)	10.2 5	Plasma	ESRD	HR: 1.7 (1.2–2.6)	Sex, age, DM duration, [30] eGFR, ACR, BP, BMI, HbA1c, TxT, cohort.	[30]
Copeptin	T2	756	eGFR >60 (N, Mi, Ma)	6.5	Plasma	Change in eGFR	Std β –0.09; p=0.03	Age, sex, eGFR, AER, [31] SBP, cholesterol, HbA1c, smoking, BMI, DM duration	[31]
Copeptin	T2	161	Newly diagnosed T2DM eGFR 109.1 $\pm$ 36.9	12	Plasma	CKD stage 3	1.74 (0.98–3.09)	Age, sex, smoking, BMI, SBP, HbA1c, TxT, DM duration, eGFR, CV disease	[32]
KIM-1	T1	124 107	Ma Ma CKD 1–3	10 12.5	Plasma	eGFR slope ESRD	P<0.001 in multiple regression analysis P<0.01 Cox regression for KIM-1 above and below 97 pg/ml	AER, eGFR, HbA1c [35]	[35]
KIM-1	T1	462	N, Mi eGFR >60	8	Plasma	(1) eGFR decline $\geq$ 3.3% per year (2) CKD $\geq$ 3 stage	(1) OR: 1.3 (1.2–1.5) (2) HR: 1.3 (1.1–1.4)	HbA1c, TxT, SBP, AER, eGFR, TNFR1	[36]
KIM-1 TNFR-1 EGF/MCP-1	T2	1032	N, Mi eGFR >60	7.4	Plasma Urine	eGFR decline >30% in 5 yrs	TNFR1: 1.42 (1.1–1.8) KIM-1: 1.41 (1.1–1.7) uEGF/MCP-1: 0.6 (0.5; 0.7)	HbA1c, ACR, BMI, SBP, eGFR, ACR, and other biomarkers	[39]
EGF/MCP-1	T2	83	Mi/Ma or eGFR <60	2	Urine	eGFR decline $\geq$ 25% per year	HR: 0.97 (0.94–0.99)	Age, sex, BP, GFR, ACR, TxT	[38]
EGF/MCP-1	T1/T2	208	Mi/Ma or eGFR <60	1.4	Urine	ESRD or eGFR decline >30%	uEGF/MCP-1: 0.8 (0.7–0.9)	Age, gender, BP, eGFR, ACR	[37]

*modelled as a -0.5 fractional polynomial. N: normoalbuminuria; Mi: Microalbuminuria; Ma: macroalbuminuria; sCr: serum creatinine, BP: blood pressure; ACR: albumin/creatinine ratio; AER: albumin excretion rate; BMI: body mass index; HbA1c: glycated hemoglobin; eGFR: estimated glomerular filtration rate; m-GFR: measured glomerular filtration rate; UA: uric acid; TxT: treatment; TG: total triglycerides; OD: odds ratio; HD: hazard ratio.