Supplementary Figure S1. Schematic of the study design

April 2010

December 2021

Survey period

SGLT2i-preceding group

SGLT2i preceded

GLP1Ra was added†

GLP1Ra-preceding group

GLP1Ra preceded*

SGLT2i was added†

＊ The period of the preceded drug is ≥6 months

†The period of the combination treatment is ≥12 months

At baseline

The data at the time of the addition

The data at the time of the final observation
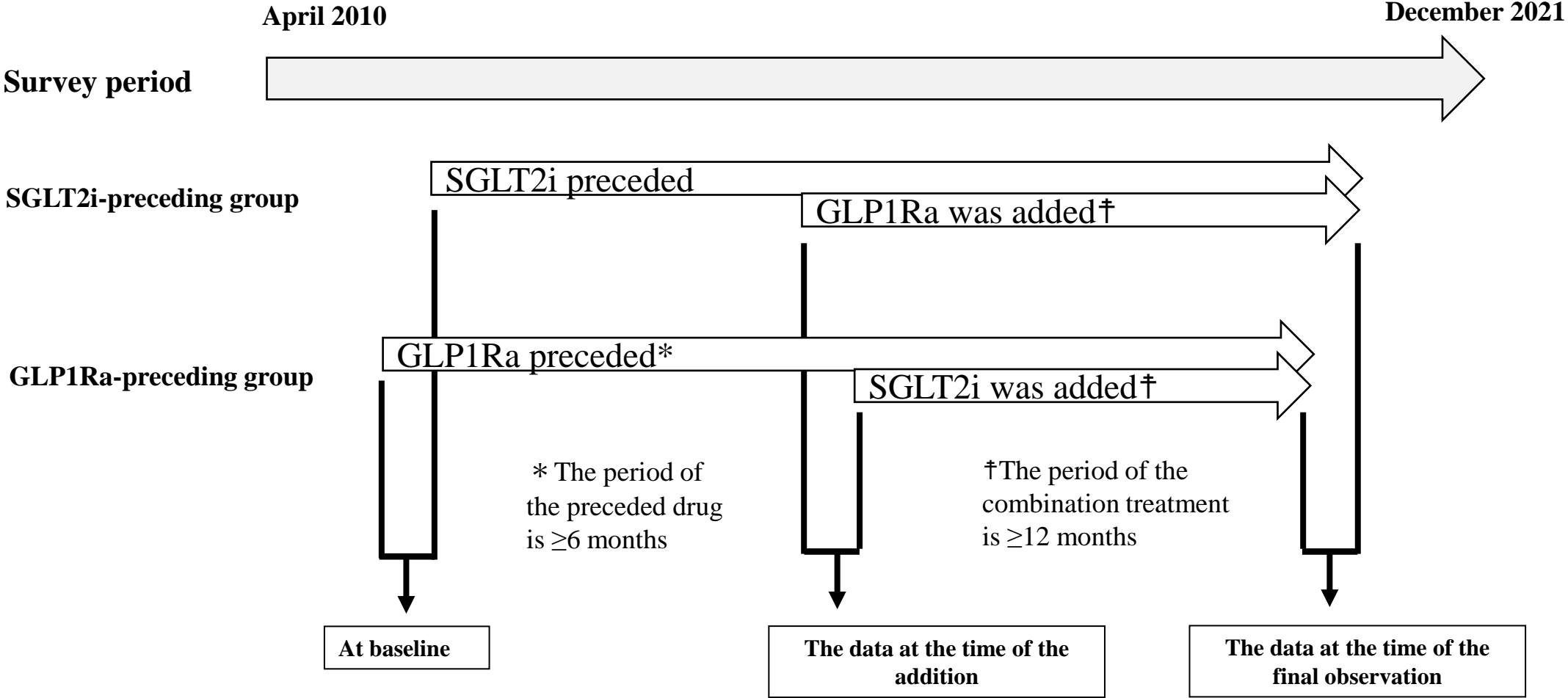
Abbreviation: GLP1Ra, glucagon-like peptide 1 receptor agonist; PS, propensity score; SGLT2i, sodium-glucose co-transporter inhibitor

Supplementary Figure S2. Schematic depiction of the study participants

Registered patients (n = 688)

Excluded 45 patients

20: Preceding treatment duration <6 months
12: Preceding treatment duration <12 months
12: the date and data at baseline were missing because the first treatment was started at another hospital
 1: treatment was discontinued during observational periods

Analyzed patients as full analysis set (FAS)
N=643

Excluded 225 patients

Data on the height, BW, BP, HbA_{1c}, eGFR, ACR or proteinuria were missing

Multiple imputation method (MI); 100 datasets

Analyzed patients as Complete case analysis set (CCA) n=418

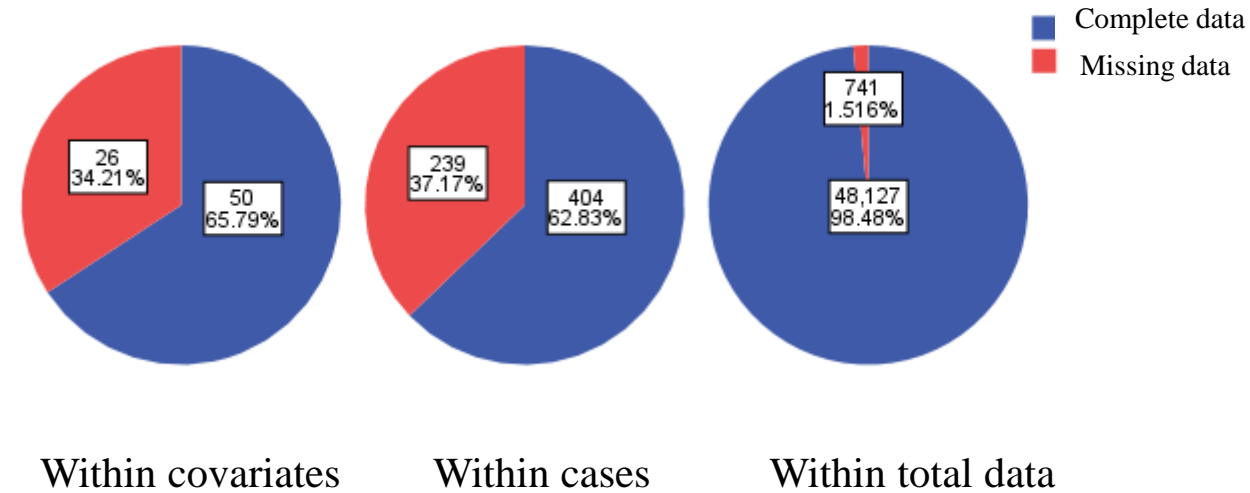|		
SGLT2i-preceding group	n=312	n=227
GLP1Ra-preceding group	n=331	n=191

Abbreviation: ACR, urine albumin-to-creatinine ratio; BP, blood pressure; BW, body weight; CCA, complete set analysis; eGFR, estimated glomerular filtration rate; FAS, full analysis set; GLP1Ra, glucagon-like peptide 1 receptor agonist; HbA1c, glycated hemoglobin A1c; MI, multiple imputation; SGLT2i, sodium-glucose co-transporter inhibitor

Supplementary Figure S3. Breakdown of the missing data

		n	Minimum	maximum	Number missing	Missing rate (%)
At baseline	Height	641	133	189.6	2	0.3
	BW (kg)	620	36.5	218.2	23	3.6
	SBP (mmHg)	606	83	236	37	5.8
	DBP (mmHg)	604	38	122	39	6.1
	HbA$_{1c}$ (%)	642	5.4	15.6	1	0.2
	eGFR (ml/min/1.73 m^2)	642	20.2	198.2	1	0.2
	ACR (mg/gCr)	500	0.3	7981.0	143	22.2
	AST (IU/dL)	630	7	212	13	2.0
	ALT (IU/dL)	636	5	203	7	1.1
	Platelets ($\times 10^4$/µl)	622	7.0	82.7	21	3.3
At the time of the addition	BW (kg)	606	33.0	182.3	37	5.8
	SBP (mmHg)	599	83	210	44	6.8
	DBP (mmHg)	598	42	114	45	7.0
	eGFR (ml/min/1.73 m^2)	640	15.7	188.6	3	0.5
	ACR (mg/gCr)	510	0.1	9495.2	133	20.7
	AST (IU/dL)	636	10	144	7	1.1
	ALT (IU/dL)	640	6	225	3	0.5
	Platelets ($\times 10^4$/µl)	626	7.7	66.6	17	2.6
At the time of the final observation	BW (kg)	633	26.0	145.2	10	1.6
	SBP (mmHg)	628	74	191	15	2.3
	DBP (mmHg)	628	40	109	15	2.3
	HbA$_{1c}$ (%)	642	5.3	15.9	1	0.2
	ACR (mg/gCr)	544	1.0	7875.3	99	15.4
	AST (IU/dL)	640	7	128	3	0.5
	ALT (IU/dL)	641	4	226	2	0.3
	Platelets ($\times 10^4$/µl)	623	6.1	60.8	20	3.1

The summary of the missing data

- Complete data
- Missing data

Within covariates — 26 (34.21%), 50 (65.79%)

Within cases — 239 (37.17%), 404 (62.83%)

Within total data — 741 (1.516%), 48,127 (98.48%)

Abbreviation: ACR, urine albumin-to-creatinine ratio; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BW, body weight; DBP, diastolic blood pressure; eGFR, estimated glomerular filtration rate; HbA1c, glycated hemoglobin A1c; SBP, systolic blood pressure
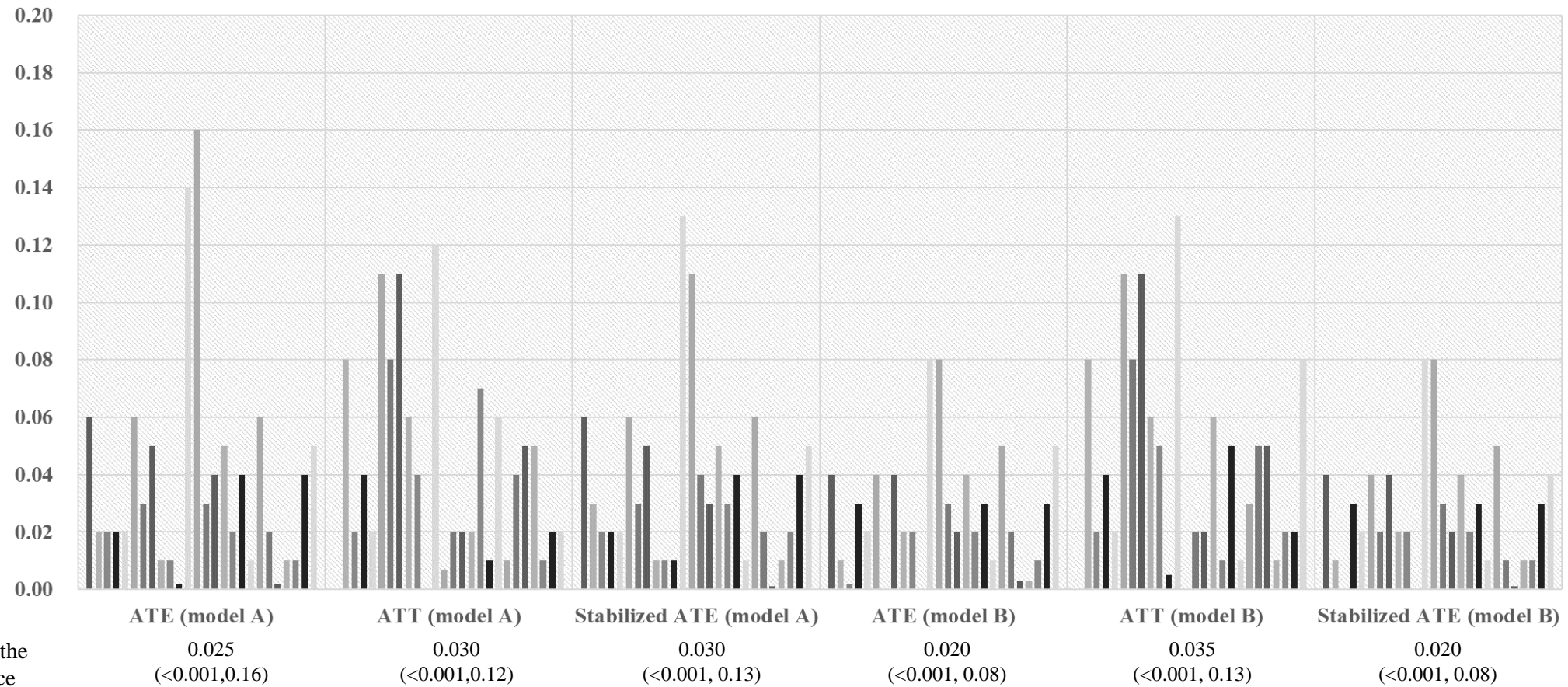
Supplementary Figure S4. Calculation of the weight using the propensity score

	The SGLT2i-preceding patients	The GLP1Ra-preceding patients
ATE weight	$1/PS$	$1/(1-PS)$
ATT weight	1	$PS/(1-PS)$
Stabilized ATE weight	p/PS	$(1-p)/(1-PS)$

The p value is the ratio of the SGLT2i-preceding patients to total patients.

Abbreviations: ATE, average treatment effect; ATT, average treatment effect on the treated; GLP1Ra; glucagon-like peptide 1 receptor agonist; PS, propensity score; SGLT2i; sodium-glucose co-transporter inhibitor

# Supplementary Figure S5. Standardized differences of each IPW model

The median (range) of the standardized difference	ATE (model A)	ATT (model A)	Stabilized ATE (model A)	ATE (model B)	ATT (model B)	Stabilized ATE (model B)
	0.025 (<0.001,0.16)	0.030 (<0.001,0.12)	0.030 (<0.001, 0.13)	0.020 (<0.001, 0.08)	0.035 (<0.001, 0.13)	0.020 (<0.001, 0.08)

- ■ Age
- ■ Sex
- ■ History of DM
- ■ BW
- ■ BMI
- ■ SBP
- ■ DBP
- ■ MAP
- ■ HbA1c
- ■ eGFR
- ■ LnACR
- ■ Duration of the preceding treatment
- ■ Duration of the combination treatment
- ■ Sulphonylurea
- ■ Metformin
- ■ Insulin
- ■ Pioglitazone
- ■ αGI
- ■ Glinide
- ■ RAS inhibitor
- ■ CCB
- ■ Bblocker
- ■ MRB
- ■ Thiazide

Truncation of the 99th percentile is utilized in model A, and trimming by 0.05≤PS≤0.95 is utilized in model B.

Abbreviations: αGI, alpha glucosidase inhibitor, BMI, body mass index; BW, body weight; CCB, calcium channel blocker; DBP, diastolic blood pressure; DM, diabetes mellitus; eGFR, estimated glomerular filtration rate; HbA$_{1c}$, glycated hemoglobin A$_{1c}$; IPW, inverse probability weighting; LnACR, logarithmic value of urine albumin-to-creatinine ratio; MAP, mean arterial pressure; MRB, mineral corticoid receptor blocker; PS, propensity score; RAS, renin aldosterone system; SBP, systolic blood pressure; SU, sulphonyl urea

Supplementary Figure S6. Distribution of the propensity score before and after matching in the CCA
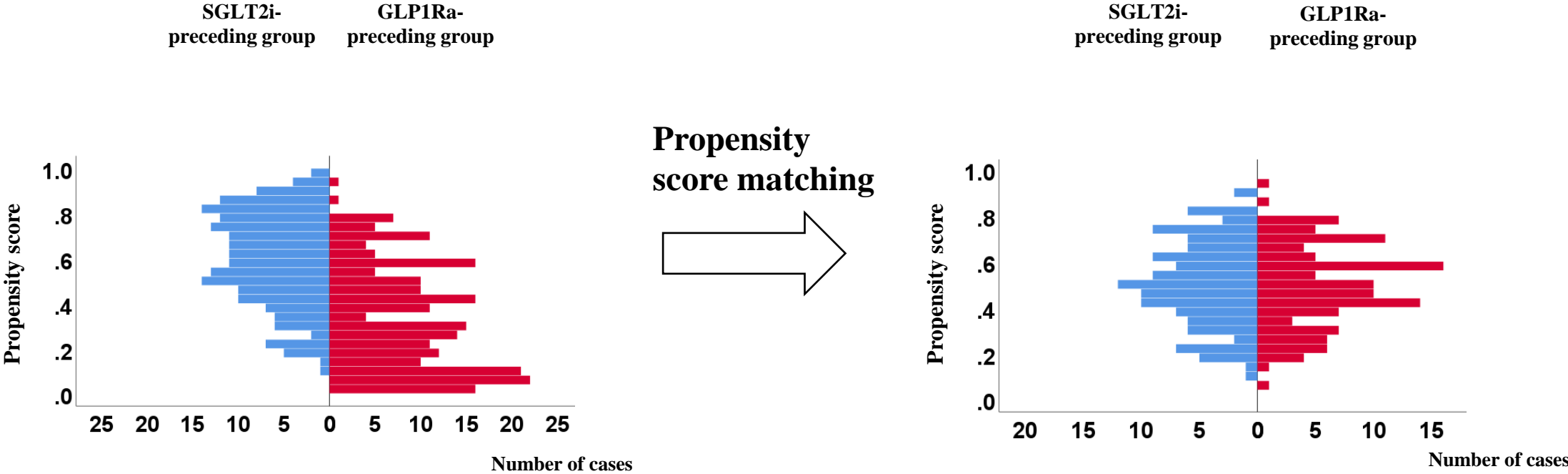
Abbreviations; CCA, complete case analysis; GLP1Ra; glucagon-like peptide 1 receptor agonist; SGLT2i; sodium-glucose co-transporter inhibitor
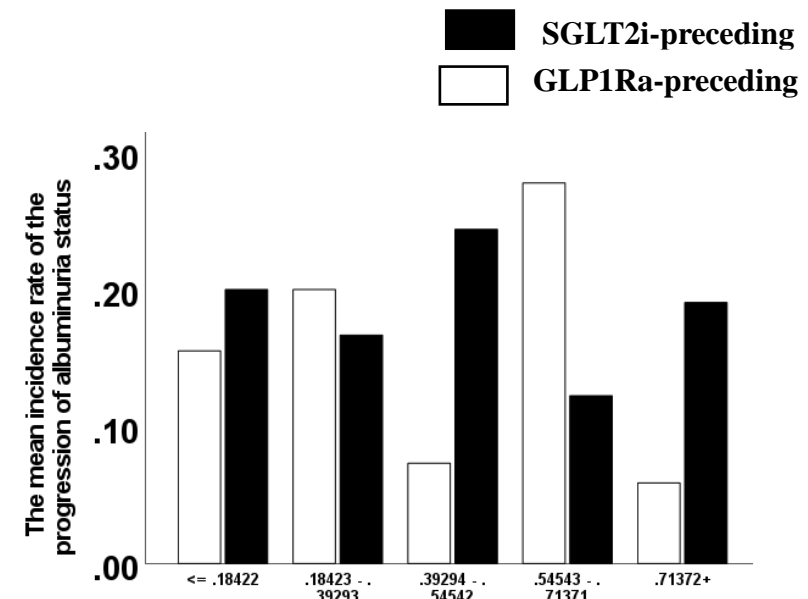
Supplementary Figure S7. Mean incidence of the renal outcomes based on the quintiles of all patients in the CCA
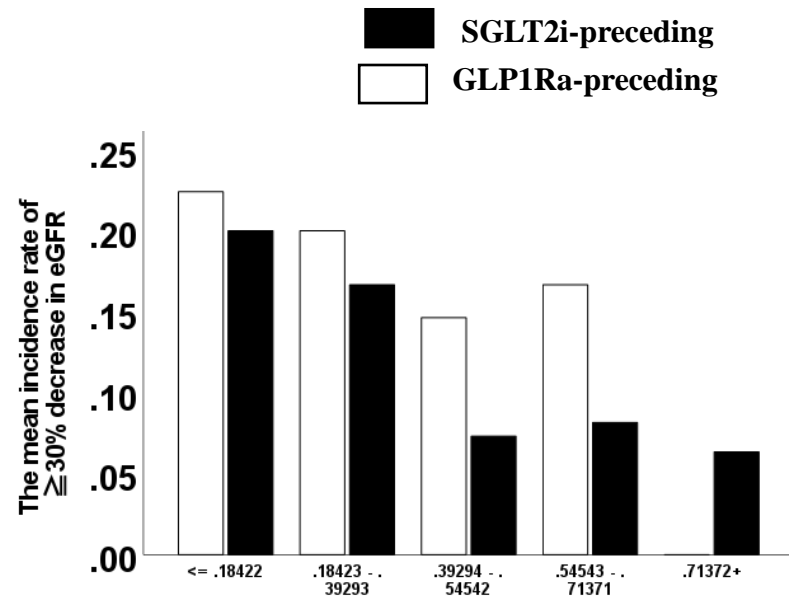
a) Renal composite outcome
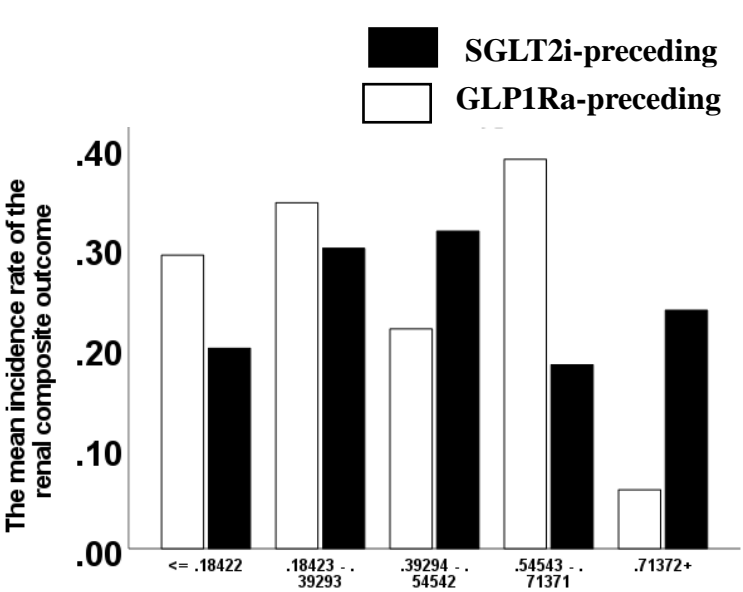
OR= 0.93 [95%CI, 0.56, 1.53], p=0.76

b) Progression of ACR status

OR=1.15 [95%CI, 0.65, 2.07], p=0.63

c) ≥30% decrease in the eGFR

OR= 0.69 [95%CI, 0.35, 1.37], p=0.29

Abbreviations: ACR, urine albumin-to-creatinine ratio; CCA, complete set analysis; CI, confidence interval; GLP1Ra, glucagon-like peptide 1 receptor agonist; OR, odds ratio; ; sodium-glucose co-transporter inhibitor