

Supplementary Table 1- Association between CUA risk and use of cinacalcet or nutritional vitamin D across the severity categories for each mineral metabolism marker in a case-control study (n=1,030 CUA cases and 2,060 controls)

Stratification of mineral metabolism markers according to tertiles		Risk for future CUA development in cinacalcet users vs. cinacalcet non-users (OR, 95% CI)	Risk for future CUA development in nutritional vitamin D users vs. nutritional vitamin D non-users (OR, 95% CI)
Serum calcium tertiles	Lowest (<8.4 mg/dL)	3.54 (1.68-7.42)	1.59 (0.97-2.61)
	Middle (8.4-10.1 mg/dL)	4.97 (2.33-10.60)	2.04 (1.20-3.45)
	Highest (>10.1 mg/dL)	2.13 (1.16-3.92)	2.10 (1.21-3.63)
Serum phosphorous tertiles	Lowest (<3.9 mg/dL)	1.71 (0.51-5.80)	1.62 (0.94-2.80)
	Middle (3.9-5.5 mg/dL)	2.26 (0.98-5.21)	2.42 (1.45-4.02)
	Highest (>5.5 mg/dL)	2.03 (1.20-3.44)	1.60 (0.96-2.66)
Serum parathyroid hormone tertiles	Lowest (<171 pg/mL)	5.26 (2.03-13.61)	3.05 (1.67-5.58)
	Middle (171-428 pg/mL)	2.01 (0.87-6.24)	1.24 (0.74-2.06)
	Highest (>428 pg/mL)	2.45 (0.72-8.71)	1.80 (1.01-2.94)
Serum 25-hydroxyvitamin D tertiles	Lowest (<11.6 ng/mL)	**	**
	Middle (11.6-18.0 ng/mL)	11.84 (1.29-58.74)	1.96 (0.61-6.27)
	Highest (>18.0 ng/mL)	6.21 (0.69-56.11)	1.34 (0.40-4.48)

\*\*Analyses could not be done due to small sample size.

Supplementary Table 2- Association between CUA risk and use of cinacalcet or nutritional vitamin D across the severity categories for each mineral metabolism marker in the FMCNA cohort (n=262,302)

Stratification of mineral metabolism markers according to tertiles		Risk for future CUA development in cinacalcet users vs. cinacalcet non-users (OR, 95% CI)	Risk for future CUA development in nutritional vitamin D users vs. nutritional vitamin D non-users (OR, 95% CI)
Serum calcium tertiles	Lowest (<8.1 mg/dL)	3.38 (2.17-6.17)	1.93 (1.17-3.17)
	Middle (8.1-9.6 mg/dL)	3.93 (2.83-4.11)	2.49 (1.72-3.62)
	Highest (>9.6 mg/dL)	3.63 (2.12-4.31)	1.26 (1.01-1.72)
Serum phosphorous tertiles	Lowest (<4.3 mg/dL)	3.05 (2.01-4.12)	1.70 (0.78-3.73)
	Middle (4.3-5.1 mg/dL)	3.84 (3.05-4.13)	2.85 (1.84-4.41)
	Highest (>5.1 mg/dL)	2.99 (2.43-3.98)	1.57 (1.12-2.22)
Serum parathyroid hormone tertiles	Lowest (<91 pg/mL)	2.21 (1.71-2.83)	1.66 (1.12-3.53)
	Middle (91-319 pg/mL)	2.79 (1.26-3.67)	2.66 (1.67-4.26)
	Highest (>319 pg/mL)	3.12 (1.52-4.31)	1.69 (1.15-2.51)
Serum 25-hydroxyvitamin D tertiles	Lowest (<14.7 ng/mL)	3.31 (1.85-8.86)	1.26 (1.10-3.37)
	Middle (14.7-29.7 ng/mL)	3.52 (2.44-6.77)	1.46 (1.12-3.57)
	Highest (>29.7 ng/mL)	2.93 (1.43-8.21)	1.48 (1.02-3.70)

Supplementary Table 3- Conditional logistic regression analyses showing association between baseline characteristics at hemodialysis initiation and subsequent CUA development

	<b>Skin biopsy-confirmed CUA (n=567 cases and 1,134 controls)</b>		<b>Clinically diagnosed CUA (n=463 cases and 926 controls)</b>	
	<b>Univariate (OR, 95% CI)</b>	<b>Multi-variable (OR, 95% CI)</b>	<b>Univariate (OR, 95% CI)</b>	<b>Multi-variable (OR, 95% CI)</b>
<b>Diabetes mellitus</b>	1.95 (1.61-2.29)	1.98 (1.71-2.65)	1.89 (1.56-3.20)	1.74 (1.35-2.89)
<b>Body mass index, per 5 kg/m<sup>2</sup> increase</b>	1.41 (1.21-1.54)	1.37 (1.31-1.47)	1.38 (1.29-1.52)	1.32 (1.24-1.48)
<b>Systolic blood pressure, per 10 mmHg increase</b>	1.03 (1.01-1.06)	1.01 (0.96-1.06)	1.02 (0.99-1.10)	1.01 (0.95-1.09)
<b>Diastolic blood pressure, per 10 mmHg increase</b>	1.01 (0.94-1.08)	1.08 (0.89-1.21)	0.98 (0.91-1.12)	1.10 (0.74-1.24)
<b>Serum calcium, per 1 mg/dL increase</b>	1.13 (1.01-1.21)	1.38 (1.21-1.61)	1.09 (0.99-1.35)	1.19 (1.10-1.35)
<b>Serum phosphorus, per 1 mg/dL increase</b>	1.06 (1.04-1.10)	1.11 (1.02-1.15)	1.05 (1.02-1.12)	1.06 (1.01-1.16)
<b>Serum PTH, per 100 pg/mL increase</b>	1.10 (1.05-1.18)	1.09 (1.06-1.19)	1.12 (1.09-1.13)	1.11 (1.04-1.26)
<b>Serum ALP, per 50 U/L increase</b>	1.05 (1.03-1.08)	1.02 (0.99-1.05)	1.15 (1.10-1.19)	1.03 (0.97-1.09)
<b>Dialysate calcium, per 1 mmol/L increase</b>	0.87 (0.68-1.24)	0.98 (0.61-1.51)	0.92 (0.54-1.12)	0.94 (0.59-1.24)
<b>Nutritional vitamin D treatment</b>	1.84 (1.32-2.41)	2.21 (1.39-3.37)	1.98 (1.26-3.25)	2.01 (1.10-2.45)
<b>Activated vitamin D treatment</b>	0.81 (0.67-0.97)	0.95 (0.76-1.26)	0.85 (0.69-1.01)	0.92 (0.74-1.36)
<b>Cinacalcet treatment</b>	3.14 (2.17-3.82)	2.14 (1.17-3.95)	2.56 (1.99-3.69)	1.86 (1.65-2.87)
<b>Phosphate binding agent treatment</b>	1.13 (1.10-1.34)	1.21 (0.81-1.65)	1.14 (1.05-1.37)	1.32 (0.78-1.56)
<b>Serum albumin, per 1 g/dL increase</b>	1.05 (0.91-1.20)	0.85 (0.74-1.14)	1.11 (0.81-1.31)	0.95 (0.69-1.22)
<b>Hemoglobin, per 1 g/dL increase</b>	0.89 (0.78-0.95)	0.91 (0.84-0.98)	0.91 (0.64-1.12)	0.85 (0.78-1.12)
<b>Serum bicarbonate, per 10 mEq/L increase</b>	0.99 (0.98-1.02)	0.98 (0.92-1.03)	0.98 (0.94-1.06)	0.91 (0.74-1.02)
<b>spKt/V, per 1 unit increase</b>	0.51 (0.46-0.78)	0.82 (0.56-1.35)	0.59 (0.41-0.87)	0.91 (0.65-1.23)
<b>Warfarin treatment</b>	3.92 (2.97-5.59)	3.21 (2.11-3.95)	2.51 (1.99-4.21)	3.56 (2.01-6.21)
<b>Statin treatment</b>	1.17 (1.01-1.42)	0.98 (0.71-1.32)	1.09 (0.99-1.58)	0.89 (0.74-1.12)
<b>ESA treatment</b>	0.64 (0.55-0.75)	0.76 (0.51-0.98)	0.56 (0.45-0.88)	0.81 (0.62-1.02)
<b>ACEi/ARB treatment</b>	1.14 (0.92-1.42)	1.12 (0.89-1.49)	1.09 (0.81-1.29)	1.09 (0.78-1.26)

Supplementary Table 4- Association between frequency of insulin injections and risk of CUA involving lower abdomen and/or upper thigh areas across the tertiles of body mass index (n=348 CUA cases and 906 controls)

Exposure	Risk for future CUA involving lower abdomen and/or upper thigh areas (OR, 95% CI) according to tertiles of body mass index		
	Lowest (<27 kg/m <sup>2</sup> )	Middle (27-35 kg/m <sup>2</sup> )	Highest (>35 kg/m <sup>2</sup> )
0 insulin injections/day	Reference	Reference	Reference
1 or 2 insulin injections/day	1.12 (1.04-3.40)	1.32 (1.12-3.75)	1.65 (0.86-3.21)
3 insulin injections/day	1.39 (0.85-6.71)	1.53 (1.01-4.96)	1.95 (0.88-4.01)
>3 insulin injections/day	3.68 (1.25-7.81)	1.99 (1.20-4.47)	2.81 (1.42-5.58)
P value (for trend in the ORs across categories of insulin injection frequency in each BMI tertile)	0.02	0.04	0.03