**Table S1. Indicators related to the severity of diabetes in KSD patients with different stone characteristics.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Length of Stones | P value | Number of Stones | P value | Location of Stones | P value |
|  | <5mm (n=367) | ≥5mm (n=568) | Single (n=290) | Multiple (n=799) | Unilateral (n=558) | Bilateral (n=531) |
| DD (years) | 8.00 (3.00-13.00) | 8.00 (3.00-13.00) | 0.487 | 8.00 (3.00-12.00) | 8.00 (3.00-13.00) | 0.643 | 8.00 (3.00-12.00) | 8.00 (3.00-13.00) | 0.660 |
| GLU (mmol/L) | 7.40 (5.66-9.50) | 7.55 (5.94-9.99) | 0.174 | 7.56 (5.82-9.92) | 7.42 (5.70-9.87) | 0.427 | 7.45 (5.85-9.88) | 7.44 (5.62-9.91) | 0.319 |
| HbA1c (%) | 8.45 (7.10-10.20) | 8.60 (7.20-10.50) | 0.280 | 8.60 (7.20-10.60) | 8.40 (7.10-10.20) | 0.193 | 8.50 (7.10-10.30) | 8.40 (7.10-10.40) | 0.806 |
| DR (n, %) | 85 (23.3%) | 149 (26.2%) | 0.290 | 82 (28.3%) | 200 (25.0%) | 0.280 | 147 (26.3%) | 135 (25.4%) | 0.729 |
| DPN (n, %) | 173 (47.1%) | 260 (45.8%) | 0.683 | 141 (48.6%) | 365 (45.7%) | 0.390 | 267 (47.8%) | 239 (45.0%) | 0.348 |
| DAN (n, %) | 14 (3.8%) | 26 (4.6%) | 0.574 | 13 (4.5%) | 22 (4.1%) | 0.798 | 26 (4.7%) | 20 (3.8%) | 0.464 |
| DN (n, %) | 111 (30.2%) | 294 (31.4%) | 0.526 | 98 (33.8%) | 244 (30.5%) | 0.306 | 186 (33.3%) | 156 (29.4%) | 0.160 |
| DD, diabetic duration; GLU, fasting plasma glucose; HbA1c, glycated hemoglobin; DR, diabetic retinopathy; DPN, diabetic peripheral neuropathy; DAN, diabetic autonomic neuropathy; DN, diabetic nephropathy |

**Table S2. Baseline characteristics of Chinese T2DM patients with/without KSD.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **With KSD(n=1091)** | **Without KSD(n=6166)** | **P value** |
| **Demographics** |
| Age (years) | 57.91 ± 11.64 | 57.93 ± 12.45 | 0.972 |
| Male (n, %) | 691 (63.3%) | 3382 (54.8%) | <0.001 |
| DD (years) | 8.00 (3.00-13.00) | 8.00 (3.00-13.00) | 0.529 |
| Smoking (n, %) |
| Never Smokers | 662 (61.7%) | 3937 (65.3%) |  0.062 # |
| Current Smokers | 301 (28.1%) | 1505 (25.0%) |
| Former Smokers | 110 (10.3%) | 583 (9.7%) |
| Drinking (n, %) |
| Never Drinkers | 776 (72.3%) | 4547 (75.5%) |  0.052 # |
| Current Drinkers | 227 (21.2%) | 1088 (18.1) |
| Former Drinkers | 70 (6.5%) | 389 (6.5%) |
| Family History of DM (n, %) | 356 (33.2%) | 2066 (34.3%) | 0.485 |
| History of Stones (n, %) | 225 (20.6%) | 218 (3.5%) | <0.001 |
| History of Gout (n, %) | 47 (4.3%) | 143 (2.3%) | <0.001 |
| **Physical Measurements** |
| SBP (mmHg) | 138.01 ± 21.01 | 137.55 ± 20.90 | 0.505 |
| DBP (mmHg) | 81.65 ± 12.35 | 80.60 ± 12.20 | <0.01 |
| BMI (kg/m2) | 24.91 ± 3.61 | 24.65 ± 3.63 | <0.05 |
| WHR | 0.95 ± 0.07 | 0.94 ± 0.07 |  <0.001 |
| **Laboratory Measurements** |
| HB (g/L) | 130 (115-143) | 129 (115-141) | 0.192 |
| ALB (g/L) | 36.90 (33.10-39.60) | 36.80 (33.60-39.30) | 0.879 |
| Lipid Profile (mmol/L) |
| TG | 1.66 (1.15-2.50) | 1.56 (1.07-2.35) |  <0.01 |
| CHOL | 4.35 (3.64-5.09) | 4.33 (3.62-5.10) |  0.649 |
| HDL-C  | 1.00 ± 0.29 | 1.03 ± 0.31 |  <0.001 |
| LDL-C | 2.86 ± 1.06 | 2.79 ± 0.98 |  0.039 |
| GLU (mmol/L) | 7.44 (5.74-9.90) | 7.58 (5.87-10.17) | 0.187 |
| HbA1c (%) | 8.50 (7.10-10.30) | 8.70 (7.20-10.70) | <0.05 |
| HOMA2-B (%) | 47.40 (27.40-79.10) | 41.60 (22.80-69.60) | <0.001 |
| HOMA2-IR | 1.28 (0.84-1.91) | 1.11 (0.75-1.70) | <0.001 |
| Serum Ca (mmol/L) | 2.18 ± 0.14 | 2.18 ± 0.15 | 0.532 |
| Serum P (mmol/L) | 0.98 ± 0.21 | 1.02 ± 0.21 | <0.001 |
| 25(OH)D (n, %) |
| < 50 nmol/L | 643 (71.3%) | 3686 (74.2%) |  0.069 |
| ≥ 50 nmol/L | 259 (28.7%) | 1283 (25.8%) |
| UA (μmol/L) | 327.91 ± 104.12 | 309.53 ± 97.63 | <0.001 |
| Cr (μmol/L) | 72.40 (57.40-95.85) | 65.70 (52.80-86.60) | <0.001 |
| eGFR (mL/min/1.73m2) | 117.99 ± 53.47 | 126.70 ± 54.14 | <0.001 |
| U-pH | 5.77 ± 0.75 | 5.68 ± 0.72 | <0.001 |
| 24HUV (mL) | 1400 (1000-2000) | 1400 (1000-2000) | 0.390 |

**Table S2. (Continued)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **With KSD(n=1091)** | **Without KSD(n=6166)** | **P value** |
| 24HUALB (mg/day) | 29.75 (8.60-139.80) | 19.00 (6.87-138.91) | <0.001 |
| **Comorbidities** |
| DR (n, %) | 282 (25.8%) | 1980 (32.1%) | <0.001 |
| DPN (n, %) | 507 (46.5%) | 3233 (52.4%) | <0.001 |
| DAN (n, %) | 46 (4.2%) | 222 (3.6%) | 0.320 |
| DFU (n, %) | 59 (5.4%) | 410 (6.6%) | 0.124 |
| DN (n, %) | 343 (31.4%) | 2036 (33.0%) | 0.305 |
| DKA (n, %) | 72 (6.6%) | 506 (8.2%) | 0.071 |
| HTN (n, %) | 619 (56.7%) | 3489 (56.6%) | 0.925 |
| CHD (n, %) | 220 (20.2%) | 1312 (21.3%) | 0.406 |
| CVD (n, %) | 153 (14.0%) | 835 (13.5%) | 0.669 |
| FL (n, %) | 467 (42.8%) | 2438 (39.5%) | <0.05 |
| RC (n, %) | 319 (29.2%) | 1263 (20.5%) | <0.001 |
| UTI (n, %) | 123 (11.3%) | 532 (8.6%) | <0.01 |
| **Medication Use** |
| Glucose lowering (n, %) |
| OHA | 806 (73.9%) | 4488 (72.8%) |  0.455 |
| Insulin | 722 (66.2%) | 4332 (70.3%) |  <0.01 |
| RAAS inhibitors (n, %) |
| ACEIs | 171 (15.7%) | 1129 (28.3%) |  <0.05 |
| ARBs | 282 (25.8%) | 1473 (23.9%) |  0.164 |
| Lipid lowering (n, %) | 801 (73.4%) | 4465 (72.4%) |  0.493 |
| a History of Urinary Stones.KSD, kidney stone disease; DD, diabetic duration; SBP, systolic blood pressure; DBP, diastolic blood pressure; BMI, body mass index; WHR, waist-hip ratio; Hb, hemoglobin; ALB, albumin; TG, triglycerides; CHOL, cholesterol; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; GLU, fasting plasma glucose; HbA1c, glycated hemoglobin; HOMA, Homeostasis Model Assessment; Ca, calcium; P, phosphorus; 25 (OH) D, 25-hydroxyvitamin D; UA, uric acid; Cr, creatinine; eGFR, estimated glomerular filtration rate; U-pH, urine-pH; 24HUV, 24-hour urine volume; 24HUALB, 24-hour urine albumin; DR, diabetic retinopathy; DPN, diabetic peripheral neuropathy; DAN, diabetic autonomic neuropathy; DFU, diabetic foot ulcer; DN, diabetic nephropathy; DKA, diabetic ketoacidosis; HTN, hypertension; CHD, coronary heart disease; CVD, cerebrovascular disease; FL, fatty liver; RC, renal cysts; UTI, urinary tract infections; OHA, oral hypoglycemic drugs; RAAS, Renin-angiotensin-aldosterone system; ACEIs, angiotensin converting enzyme inhibitor; ARBs, angiotensin II receptor blockers. # P value for trend.  |

**Table S3. Logistic regression analysis of KSD risk in T2DM patients without a history of urinary stones.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B | SE | Wald | df | P-value | Odds Ratio | 95%CI for OR |
| Lower | Upper |
| Sex | 0.201 | 0.098 | 4.185 | 1 | <0.05 | 1.223 | 1.008 | 1.483 |
| age |  |  | 9.523 | 3 | <0.05 |  |  |  |
| age (1) | 0.255 | 0.152 | 2.804 | 1 | 0.094 | 1.29 | 0.957 | 1.739 |
| age (2) | 0.046 | 0.159 | 0.084 | 1 | 0.772 | 1.047 | 0.767 | 1.429 |
| age (3) | -0.202 | 0.215 | 0.881 | 1 | 0.348 | 0.817 | 0.536 | 1.246 |
| HOMA2-IR | 0.224 | 0.094 | 5.741 | 1 | <0.05 | 1.252 | 1.042 | 1.504 |
| UA | 0.269 | 0.099 | 7.463 | 1 | <0.01 | 1.309 | 1.079 | 1.588 |
| Serum P |  |  | 17.302 | 3 | <0.001 |  |  |  |
| Serum P (1) | -0.01 | 0.117 | 0.007 | 1 | 0.931 | 0.99 | 0.787 | 1.246 |
| Serum P (2) | -0.354 | 0.13 | 7.428 | 1 | <0.01 | 0.702 | 0.545 | 0.905 |
| Serum P (3) | -0.425 | 0.131 | 10.49 | 1 | <0.01 | 0.654 | 0.505 | 0.845 |
| RC | 0.355 | 0.106 | 11.209 | 1 | <0.001 | 1.426 | 1.159 | 1.756 |
| ACEIs | -0.308 | 0.124 | 6.203 | 1 | <0.05 | 0.735 | 0.577 | 0.937 |
| Constant | -2.196 | 0.184 | 142.701 | 1 | <0.001 | 0.111 |  |  |
| 24 covariates (sex, age, DBP, BMI, WHR, history of gout, M, TG, HDL-C, LDL-C, HbA1c, HOMA2-IR, Cr, UA, U-pH, 24UALB, serum P, DR, DPN, FL, RC, UTI, use of insulin, use of ACEIs) were included in this logistic regression model. HOMA, Homeostasis Model Assessment; UA, uric acid; P, phosphorus; RC, renal cysts; ACEIs, angiotensin converting enzyme inhibitors. |

**Table S4. Logistic regression analysis of KSD risk in male T2DM patients without a history of urinary stones.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B | SE | Wald | df | P-value | Odds Ratio | 95%CI for OR |
| Lower | Upper |
| TG | 0.275 | 0.119 | 5.376 | 1 | <0.05 | 1.317 | 1.044 | 1.662 |
| HOMA2-IR | 0.262 | 0.121 | 4.687 | 1 | <0.05 | 1.3 | 1.025 | 1.648 |
| Serum P |  |  | 13.914 | 3 | <0.01 |  |  |  |
| Serum P (1) | -0.114 | 0.143 | 0.637 | 1 | 0.425 | 0.892 | 0.673 | 1.181 |
| Serum P (2) | -0.562 | 0.168 | 11.156 | 1 | <0.01 | 0.57 | 0.41 | 0.793 |
| Serum P (3) | -0.398 | 0.167 | 5.654 | 1 | <0.05 | 0.672 | 0.484 | 0.932 |
| RC | 0.444 | 0.125 | 12.62 | 1 | <0.001 | 1.558 | 1.22 | 1.99 |
| UTI | 0.831 | 0.306 | 7.376 | 1 | <0.01 | 2.297 | 1.26 | 4.185 |
| Constant | -1.973 | 0.133 | 219.994 | 1 | <0.001 | 0.139 |  |  |
| 13 covariates (age, history of gout, TG, HOMA2-IR, serum P, Cr, UA, U-pH, DR, DPN, DFU, RC, UTI) were included in this logistic regression model. TG, triglycerides; HOMA, Homeostasis Model Assessment; P, phosphorus; RC, renal cysts; ACEI, angiotensin converting enzyme inhibitor. |

**Table S5. Logistic regression analysis of KSD risk in female T2DM patients without a history of urinary stones.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B | SE | Wald | df | P value | Odds Ratio | 95%CI for OR |
| Lower | Upper |
| SBP | 0.347 | 0.148 | 5.509 | 1 | <0.05 | 1.414 | 1.059 | 1.889 |
| ACEIs | -0.58 | 0.217 | 7.12 | 1 | <0.01 | 0.56 | 0.366 | 0.857 |
| HOMA2-B | 0.671 | 0.193 | 12.075 | 1 | <0.01 | 1.956 | 1.34 | 2.855 |
| Constant | -2.277 | 0.113 | 409.286 | 1 | <0.001 | 0.103 |  |  |
| 16 covariates (sex, SBP, DBP, WHR, Hb, GLU, HbA1c, HOMA2-B, Cr, UA, U-pH, 24UALB, serum P, DR, use of ACEIs, use of ARBs) were included in this logistic regression model. SBP, systolic blood pressure; ACEIs, angiotensin converting enzyme inhibitors; HOMA, Homeostasis Model Assessment. |