**Additional file 1 for supplementary materials**

Stratified analysis was performed on group b to explore the effect of different risk factors. There were 20 (26.66%) subjects with hypertension, 8 (26.67%) with hyperlipidemia and 2 (6.67%) with the usage of NSAIDs. Analysis showed that there was no subject in the current study with diabetic mellitus alone. The detailed data is showed in Table S1.

Table S1. the mean level of SU, sCr and eGFR in patients with hypertension, hyperlipidemia and the usage of NSAIDs.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Hypertension(n=20) | Hyperlipidemia (n=8) | NSAIDs (n=2) |
| baseline | | | |
| sCr | 147.00 ± 53.90 | 150.13 ± 78.85 | 118.50 ± 0.71 |
| eGFR | 48.78 ± 11.95 | 52.25 ± 15.18 | 61.93 ± 4.02 |
| SU | 599.20 ± 92.94 | 639.25 ± 134.37 | 477.50 ± 68.59 |
| 4 weeks | | | |
| sCr | 133.60 ± 32.96 | 172.25 ± 98.26 | 116.00 ± 0.00 |
| eGFR | 52.86 ± 11.50 | 49.10 ± 20.86 | 66.71 ± 0.00 |
| SU | 409.50 ± 69.03 | 497.75 ± 63.20 | 522.00 ± 0.00 |
| 8 weeks | | | |
| sCr | 134.73 ± 24.20 | 139.71 ± 71.36 | 111.00 ± 5.66 |
| eGFR | 51.75 ± 11.42 | 56.10 ± 17.01 | 66.77 ± 0.86 |
| SU | 424.08 ± 119.06 | 471.00 ± 98.24 | 412.50 ± 37.48 |
| 12~16 weeks | | | |
| sCr | 129.29 ± 34.62 | 144.50 ± 72.84 | 106.50 ± 6.36 |
| eGFR | 54.99 ± 12.77 | 53.91 ± 15.00 | 70.05 ± 0.20 |
| SU | 453.53 ± 87.07 | 508.13 ± 117.30 | 384.50 ± 152.03 |
| 20~28 weeks | | | |
| sCr | 133.56 ± 30.90 | 149.14 ± 70.60 | 104.00 ± 8.48 |
| eGFR | 52.40 ± 11.25 | 51.21 ± 14.84 | 72.08 ± 1.62 |
| SU | 447.53 ± 112.08 | 435.57 ± 21.93 | 405.50 ± 119.50 |
| 32~44 weeks | | | |
| sCr | 132.31 ± 43.11 | 108.40 ± 7.34 | 90.00 ± 0.00 |
| eGFR | 54.96 ± 13.68 | 65.23 ± 4.20 | 80.78 ± 0.00 |
| SU | 422.69 ± 91.30 | 458.40 ± 131.55 | 258.00 ± 0.00 |
| 44~ weeks | | | |
| sCr | 141.45 ± 47.70 | 142.75 ± 103.42 | 104.00 ± 2.83 |
| eGFR | 50.76 ± 12.85 | 61.77 ± 23.33 | 71.97 ± 2.91\* |
| SU | 435.00 ± 111.04# | 419.50 ± 115.12# | 577.00 ± 401.637 |

Abbreviations: NSAIDs, Non-Steroidal Antiinflammatory Drugs; sCr, serum creatinine, µmol/L; eGFR, estimated glomerular filtration rate, ml/min/1.73m2; SU, serum urate, µmol/L; \**P* < 0.05, HP vs. NSAIDs. #*P* < 0.05, 44~ weeks vs. baseline.

Table S2. mean SU, sCr and eGFR and RAT after ULT with febuxostat

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Overall(n=87) | CKD 2(n=25) | CKD 3(n=58) | CKD 4(n=4) |
| SU (µmol/L) | | | | |
| baseline | 598.22 ± 95.11 | 588.56 ± 88.04 | 593.43 ± 87.70 | 728.00 ± 165.91 |
| 4 weeks | 457.73 ± 94.39\* | 442.31 ± 90.04\* | 465.97 ± 94.50\* | 434.50 ± 171.83 |
| 8 weeks | 446.6 ± 105.07\* | 434.50 ± 76.79\* | 458.29 ± 111.98\* | 338.00 ± 123.04 |
| 12~16 weeks | 441.66 ± 113.93\* | 471.53 ± 108.64\* | 428.23 ± 118.97\* | 430.75 ± 75.24 |
| 20~28 weeks | 409.08 ± 91.67\* | 457.61 ± 79.90\* | 388.95 ± 91.11\* | 402.00 ± 83.55\* |
| 32~36 weeks | 415.74 ± 105.61\* | 405.00 ± 118.26\* | 421.03 ± 104.55\* | 409.00 ± 26.87 |
| 44~ weeks | 429.76 ± 123.45\* | 445.72 ± 135.37\* | 425.67 ± 120.70\* | 389.25 ± 93.95\* |
| sCr (µmol/L) | | | | |
| baseline | 138.42 ± 42.77 | 111.72 ± 3.67 | 139.51 ± 24.64 | 289.50 ± 66.28 |
| 4 weeks | 131.45 ± 38.46 | 113.23 ± 18.22 | 132.64 ± 27.58 | 232.00 ± 120.21 |
| 8 weeks | 125.25 ± 33.58\* | 113.33 ± 14.16 | 123.07 ± 21.42\* | 229.50 ± 96.87 |
| 12~16 weeks | 126.94 ± 37.68\* | 109.79 ± 13.06 | 125.50 ± 24.81\* | 222.75 ± 78.68\* |
| 20~28 weeks | 128.42 ± 36.06\* | 112.89 ± 9.58 | 126.93 ± 27.77\* | 214.00 ± 70.74\* |
| 32~36 weeks | 122.17 ± 30.01\* | 108.62 ± 8.41 | 122.97 ± 25.05\* | 198.00 ± 83.44 |
| 44~ weeks | 131.54 ± 44.91\* | 110.24 ± 19.43 | 131.53 ± 28.17\* | 264.75 ± 110.85 |
| eGFR (ml/min/1.73m2) | | | | |
| baseline | 52.37 ± 11.73 | 64.34 ± 3.54 | 49.30 ± 8.01 | 22.04 ± 4.79 |
| 4 weeks | 55.95 ± 12.88\* | 66.53 ± 10.66 | 52.98 ± 9.86\* | 31.81 ± 15.27 |
| 8 weeks | 57.33 ± 11.56\* | 63.18 ± 8.16 | 56.78 ± 10.21\* | 30.46 ± 11.17 |
| 12~16 weeks | 58.13 ± 14.46\* | 66.72 ± 10.35 | 56.69 ± 12.77\* | 31.71 ± 11.47 |
| 20~28 weeks | 56.59 ± 12.59\* | 63.35 ± 7.06 | 55.97 ± 11.76\* | 32.70 ± 10.68 |
| 32~36 weeks | 59.18 ± 12.36\* | 66.19 ± 6.63 | 57.81 ± 11.88\* | 34.76 ± 15.12 |
| 44~ weeks | 56.51 ± 15.01\* | 67.34 ± 12.40 | 53.84 ± 12.21\* | 27.50 ± 12.66 |
| RATa (the number of SU < 360 /the number of subjects who had record, %) | | | | |
| 4 weeks | 6/45(13.30%) | 3/13(23.10%) | 2/30(6.70%) | 1/2(50.00%) |
| 8 weeks | 10/45(22.20%) | 2/12(16.70%) | 7/31(22.60%) | 1/2(50.00%) |
| 12~16 weeks | 15/65(24.20%) | 4/19(21.10%) | 10/39(25.60%) | 1/4(25.00%) |
| 20~28 weeks | 21/64(32.80%) | 1/17(5.60%) | 18/42(42.90%) | 2/4(50.00%) |
| 32~36 weeks | 16/47(34.00%) | 5/14(35.70%) | 11/31(35.50%) | -- |
| 44~ weeks | 30/87(34.50%) | 6/25(24.00%) | 22/58(37.90%) | 2/4(50.00%) |
| RATb (the number of SU < 360 /the number of subjects who had record, %) | | | | |
| 4 weeks | 1/18(5.60%) | -- | 1/13(7.70%) | -- |
| 8 weeks | 4/21(19.00%) | -- | 4/15(26.70%) | -- |
| 12~16 weeks | 5/27(18.50%) | -- | 4/18(22.20%) | 1/2(50.00%) |
| 20~28 weeks | 5/25(20.00%) | -- | 4/16(25.00%) | 1/2(50.00%) |
| 32~36 weeks | 6/20(30.00%) | 2/8(25.00%) | 4/11(36.40%) | -- |
| 44~ weeks | 13/33(39.40%) | 3/8(37.50%) | 923(39.10%) | 1/2(50.00%) |
| RATc (the number of SU < 300 /the number of subjects who had record, %) | | | | |
| 4 weeks | 1/45(2.20%) | 1/13(7.70%) | -- | -- |
| 8 weeks | 2/45(4.40%) | -- | 1/31(3.20%) | 1/2(50.00%) |
| 12~16 weeks | 5/62(8.10%) | 1/19(5.30%) | 4/39(10.30%) | -- |
| 20~28 weeks | 7/64(10.90%) | -- | 7/42(16.70%) | -- |
| 32~36 weeks | 3/47(6.40%) | 1/14(7.10%) | 2/31(6.50%) | -- |
| 44~ weeks | 8/87(9.20%) | 1/25(4.00%) | 7/58(12.10%) | -- |
| RATd (the number of SU < 300 /the number of subjects who had record, %) | | | | |
| 4 weeks | -- | -- | -- | -- |
| 8 weeks | 1/21(4.80%) | -- | 1/15(6.70%) | -- |
| 12~16 weeks | 1/27(3.70%) | -- | 1/18(5.60%) | -- |
| 20~28 weeks | -- | -- | -- | -- |
| 32~36 weeks | -- | -- | -- | -- |
| 44~ weeks | 1/33(3.00%) | 1/8(12.50%) | -- | -- |

RAT, the rate of achieving target SU(SU < 360 µmol/L). RATa, RAT for overall subjects. RATb, RAT for subjects with tophus. RATc, the rate of achieving SU < 300 µmol/L for overall subjects. RATd, the rate of achieving SU < 300 µmol/L for subjects with tophus. SU, serum urate. sCr, serum creatinine. eGFR, estimated glomerular filtration rate. ULT, urate-lowering treatment. \**P* < 0.05, before vs. after treatment.

Table S3. clinical factors related to target-achieving by univariate logistic regression

|  |  |  |
| --- | --- | --- |
| Clinical characteristics | Univariate logistic regression | |
| OR, 95%CI | P value |
| body weight | 0.952(0.905-1.002) | 0.058 |
| baseline SU | 0.995(0.99-1.000) | 0.050 |
| baseline eGFR | 0.970(0.934-1.008) | 0.122 |
| **acute arthritis（baseline）** | **2.593(1.015-6.625)** | **0.047** |
| age | 1.021(0.985-1.059) | 0.257 |
| duration of disease | 0.980(0.922-1.043) | 0.531 |
| medical insurance | 1.375(0.517-3.659) | 0.524 |
| occupation | 1.680(0.775-3.642) | 0.189 |
| residence | 1.056(0.560-1.992) | 0.866 |
| gout flares | 0.888(0.725-1.088) | 0.251 |
| follow-up time | 1.009(0.938-1.086) | 0.800 |
| previous ULT | 0.774(0.462-1.296) | 0.330 |
| family history | 0.359(0.040-3.219) | 0.360 |
| hypertension | 1.448(0.591-3.549) | 0.418 |
| diabetic mellitus | 1.308(0.339-5.047) | 0.697 |
| hyperlipidemia | 1.158(0.459-2.919) | 0.756 |
| cardio-cerebrovascular disease | 2.650(0.655-10.726) | 0.172 |
| the usage of NSAIDs | 0.607(0.115-3.210) | 0.557 |
| risk factors | 1.149(0.705-1.871) | 0.577 |
| BMI | 0.893(0.765-1.042) | 0.152 |
| baseline sCr | 1.005(0.995-1.015) | 0.336 |
| tophus | 1.415(0.573-3.494) | 0.452 |
| Initial dosage of febuxostat | 1.009(0.967-1.052) | 0.689 |
| terminal dosage of febuxostat | 1.016(0.992-1.042) | 0.199 |

Abbreviations: ULT, urate-lowering treatment. BMI, Body Mass Index.