**Supporting Information**

**Supplementary Table 1. Laboratory data for the study population at baseline and 12 weeks**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | SU  (n=26) | | Repaglinide  (n=26) | | *P* value |
|  | Baseline | 12weeks | Baseline | 12weeks |  |
| Body mass index (kg/m2) | 21.5± 2.16 | 21.5± 2.25 | 21.8 ± 2.04 | 21.9± 1.98 | 0.16 |
| FPG (mM/l) | 8.44 ± 1.53 | 8.56 ± 1.71 | 8.20 ± 1.97 | 7.92 ± 1.88 | 0.38 |
| †IRI (µU/ml) | 4.06 ± 2.90 | 3.87 ± 2.13 | 4.83 ± 3.6 | 4.45 ± 2.3 | 0.93 |
| †§HOMA-IR | 1.43 (0.79-1.87) | 1.36 (0.95-2.05) | 1.51 (0.95-1.88) | 1.45 (0.83-2.07) | 0.67 |
| †HOMA-β | 17.8 ± 12.1 | 17.3 ± 13.5 | 22.9 ± 14.1 | 23.1 ± 13.8 | 0.68 |
| BUN(mg/dl) | 16.7 ± 6.54 | 18.1 ± 7.53 | 17.3 ± 5.44 | 17.1 ± 5.30 | 0.70 |
| creatinine (mg/dl) | 0.82 ± 0.21 | 0.85 ± 0.21 | 0.85 ± 0.25 | 0.86 ± 0.30 | 0.76 |
| AST (IU/ml) | 22.5 ± 6.53 | 24.0 ± 8.42 | 22.2 ± 6.11 | 21.8 ± 6.94 | 0.24 |
| ALT (IU/ml) | 21.8 ± 8.51 | 21.0 ± 8.90 | 21.9 ± 15.1 | 21.9 ± 17.4 | 0.80 |
| γ-GT (IU/ml) | 32.4 ± 23.6 | 28.5 ± 19.2 | 27.7 ± 19.6 | 24.0 ± 14.4 | 0.96 |
| TG (mg/dl) | 99.4 ± 36.6 | 94.3 ± 42.1 | 110 ± 59.1 | 98.3 ± 35.2 | 0.54 |
| Total-chol (mg/dl) | 169 ± 16.9 | 168 ± 18.6 | 177 ± 28.6 | 173 ± 26.0 | 0.54 |
| HDL-chol (mg/dl) | 58.3 ± 14 | 59.5 ± 13 | 62.7 ± 18 | 59.4 ± 13 | **0.03** |
| Uric acid (mg/dl) | 5.19 ± 1.18 | 5.39 ± 1.31 | 5.23 ± 1.14 | 5.13 ± 1.10 | 0.15 |
| LogUACR (mg/gCre) | 1.52 ± 0.70 | 1.55 ± 0.57 | 1.41 ± 0.76 | 1.41 ± 0.78 | 0.67 |

SU, Sulfonyl Urea; FPG, fasting plasma glucose; GA, glycated albumin; HbA1c/GA glycated hemoglobin A1c to glycated albumin ratio; IRI, immunoreactive insulin; HOMA-IR, homeostatic model assessment of insulin resistance; HOMA-β,homeostatic model assessment of β cell function; AST,aspartate transaminase; ALT,alanine aminotransferase;γGT, γ- glutamyltransferase; TG, triacylglycerol; Total-chol, total cholesterol ;HDL-chol, High-density lipoproteins cholesterol; UACR, Urinary albumin creatinine ratio.

Values are mean ± SD or median (range).

*P* value for the change in SU *vs*. that in Repa groups.

†Data were obtained in 47 patients (SU n=22, Repa n=25).

§The Mann-Whitney U test was applied to HOMA-IR.

**Supplementary Table 2. The association between SU dose and rate of improvement following switching from SU to Repa.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Rate of improvement (%)** | | |  |
| **SU** (equivalent to glimepiride mg) | **0.5**  **(n=10)** | **1.0**  **(n=11)** | **1.5** ≤  **(n=4)** | ***P* value for the Fisher’s extract test** |
| **HbA1c** | 90 | 82 | 75 | 0.756 |
| **GA** | 100 | 64 | 25 | **0.014** |
| **GA/HbA1c** | 70 | 64 | 50 | 0.804 |

SU, Sulfonyl Urea; Repa, Repaglinide; GA, glycated albumin; GA/HbA1c, glycated hemoglobin A1c to glycated albumin ratio;

ΔGA, change in GA from 0–12 weeks

BMI, body mass index; SU, Sulfonyl Urea; FPG, fasting blood glucose; GA, glycated albumin; HbA1c/GA glycated hemoglobin A1c to glycated albumin ratio; IRI, immunoreactive insulin; HOMA-IR, homeostatic model assessment of insulin resistance; HOMA-β,homeostatic model assessment of β cell function;γGT, γ- glutamyltransferase; TG, triacylglycerol; UACR, Urinary albumin creatinine ratio.

Values were analysed using Pearson’s correlation

†Values were analysed using the Spearman’s rank correlation test because normality was rejected for this variables

**Supplementary Table 3. Analysis of the contributing factors to the change in GA or GA/HbA1c in the Repa group**

**ΔGA**

|  |  |  |
| --- | --- | --- |
| **Variables** | **r** | ***P* value** |
| **Age** | -0.102 | 0.628 |
| **Sex** | 0.368 | 0.071 |
| **BMI** | 0.068 | 0.785 |
| **HbA1c** | -0.081 | 0.701 |
| **FPG** | -0.312 | 0.128 |
| **IRI** | -0.300 | 0.186 |
| †**HOMA-IR** | -0.097 | 0.684 |
| **HOMA-β** | -0.019 | 0.935 |
| **SU (equivalent to glimepiride mg)** | 0.314 | 0.126 |
| **γ-GT (IU/ml)** | 0.364 | 0.104 |
| **Total cholesterol** | 0.025 | 0.912 |
| **TG (mg/dl)** | 0.275 | 0.184 |

ΔGA, change in GA from 0–12 weeks

BMI, body mass index; SU, Sulfonyl Urea; FPG, fasting plasma glucose; GA, glycated albumin; HbA1c/GA glycated hemoglobin A1c to glycated albumin ratio; IRI, immunoreactive insulin; HOMA-IR, homeostatic model assessment of insulin resistance; HOMA-β,homeostatic model assessment of β cell function;γGT, γ- glutamyltransferase; TG, triacylglycerol; UACR, Urinary albumin creatinine ratio.

Values were analysed using Pearson’s correlation

†Values were analysed using the Spearman’s rank correlation test because normality was rejected for this variables

**ΔGA/HbA1c**

|  |  |  |
| --- | --- | --- |
| **Variables** | **r** | ***P* value** |
| **Age** | -0.143 | 0.537 |
| **Sex** | 0.170 | 0.463 |
| **BMI** | 0.093 | 0.688 |
| **HbA1c** | -0.046 | 0.827 |
| **FPG** | -0.362 | 0.075 |
| **IRI** | -0.363 | 0.186 |
| †**HOMA-IR** | 0.110 | 0.650 |
| **HOMA-β** | -0.037 | 0.872 |
| **SU (equivalent to glimepiride mg)** | 0.176 | 0.401 |
| **γ-GT (IU/ml)** | 0.245 | 0.286 |
| **Total cholesterol** | <0.01 | 0.996 |
| **TG (mg/dl)** | 0.351 | 0.085 |

ΔGA/HbA1c, change in GA/HbA1c from 0–12 weeks

BMI, body mass index; SU, Sulfonyl Urea; FPG, fasting plasma glucose; GA, glycated albumin; HbA1c/GA glycated hemoglobin A1c to glycated albumin ratio; IRI, immunoreactive insulin; HOMA-IR, homeostatic model assessment of insulin resistance; HOMA-β,homeostatic model assessment of β cell function; AST,aspartate transaminase; ALT,alanine aminotransferase;γGT, γ- glutamyltransferase; TG, triacylglycerol; Total-chol, total cholesterol ;HDL-chol, High-density lipoproteins cholesterol; UACR, Urinary albumin creatinine ratio.

Values were analysed using Pearson’s correlation

†Values were analysed using the Spearman’s rank correlation test because normality was rejected for this variables