SUPPLEMENTARY MATERIAL (5 tables)

**Oral vitamin D supplementation has a lower bioavailability and reduces hypersecretion of parathyroid hormone and insulin resistance in obese Chinese males**

**Supplemental Table 1** Primers for five single-nucleotide polymorphisms (SNPs) analysis of the vitamin D receptor gene

|  |  |  |
| --- | --- | --- |
| SNPs | Position on NC\_000012.11 \* | Sequences of forward (F) and backward (B) primer pairs (5’-3’) |
| *Taq*I (rs731236) & | 48238757 | F: CATCTTGGCATAGAGCAGGTG |
| *Apa*I (rs7975232) † | 48238837 | B: GGTTCAGCAGCAAATGGGACA |
| rs3782905 ‡ | 48266167 | F: GGTGTCTGCTTCAGGGGTCT |
|  |  | B: TTCCCATCCATTAGTTTCCACA |
| *Fok*I (rs2228570) | 48272895 | F: GTGGCTGTGAGCGCCGCATGTTC |
|  |  | B: ATGCCAGCTGGCCCTGGCACT |
| *Cdx-2* (rs11568820) ‡ | 46588812 | F: TTATATATATTCCTGAGTAAACTAGGTC*T*CA § |
|  |  | B: GCGTGGAGTTAGAAAGACAGAAG |

\* NCBI Reference Sequence.

† These two SNPs were adjacent and included in the same PCR product.

‡ rs3782905 and rs11568820 were analyzed with *Dde*I and *BseM*II, respectively.

§ The underlined italic letter indicated the replacement of A with T to introduce a restriction enzyme site of *BseM*II into the PCR product.

**Supplemental Table 2** Genotypic and allelic frequencies of the vitamin D receptor gene based on five single-nucleotide polymorphisms (SNPs)

|  |  |  |
| --- | --- | --- |
| SNPs | Normal-weight (*n* 82) | Obese (*n* 99) |
| Genotypic frequency, major homo- / hetero- / minor homozygotes, % | | |
| *Taq*I (rs731236) | 90.2 / 9.8 / 0 | 92.9 / 7.1 / 0 |
| *Apa*I (rs7975232) | 56.1 / 35.4 / 8.5 | 40.4 / 51.5 / 8.1 |
| rs3782905 | 68.3 / 30.5 / 1.2 | 75.8 / 19.2 / 5.1 |
| *Fok*I (rs2228570) | 30.5 / 52.4 / 17.1 | 27.3 / 44.4 / 28.3 |
| *Cdx-2* (rs11568820) | 45.1 / 40.2 / 14.6 | 35.4 / 42.4 / 22.2 |
| Allelic frequency, major : minor allele, % | | |
| *Taq*I (rs731236) | 95.1 / 4.9 | 96.5 / 3.5 |
| *Apa*I (rs7975232) | 73.8 / 26.2 | 66.2 / 33.8 |
| rs3782905 | 83.5 / 16.5 | 85.4 / 14.6 |
| *Fok*I (rs2228570) | 56.7 / 43.3 | 49.5 / 50.5 |
| *Cdx-2* (rs11568820) | 65.2 / 34.8 | 56.6 / 43.4 |

**Supplemental Table 3** Correlations between plasma 25(OH)D level and vitamin D receptor genotype based on five single-nucleotide polymorphisms (SNPs) with group, age, and body mass index as controlling factors (*n* 181: 82 + 99)

|  |  |
| --- | --- |
| SNPs | *P* value |
| *Taq*I (rs731236) | 0.889 |
| *Apa*I (rs7975232) | 0.054 |
| rs3782905 | 0.608 |
| *Fok*I (rs2228570) | 0.964 |
| *Cdx-2* (rs11568820) | 0.913 |

**Supplemental Table 4** Biometric profiles of subjects in the intervention trial

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Normal-weight (*n* 21) | |  | Obese (*n* 21) | | *P* value \* |
| Mean | SD | Mean | SD |
| Age, y | 34.3 | 8.0 |  | 44.7 | 8.8 | < 0.001 |
| Height, cm | 170.5 | 6.1 |  | 170.3 | 6.6 | 0.298 |
| Body weight, kg | 63.7 | 6.0 |  | 87.6 | 8.7 | < 0.001 |
| Body mass index, kg/m2 | 21.9 | 1.2 |  | 30.3 | 1.7 | < 0.001 |
| Triceps skinfold, mm | 10.7 | 2.5 |  | 20.5 | 4.7 | < 0.001 |
| Subscapular skinfold, mm | 17.7 | 4.5 |  | 34.9 | 7.0 | < 0.001 |
| Abdominal skinfold, mm | 21.8 | 6.8 |  | 36.5 | 7.0 | < 0.001 |
| Waist circumference, cm | 80.0 | 4.7 |  | 104.7 | 5.3 | < 0.001 |
| Waist-hip ratio | 0.84 | 0.05 |  | 0.98 | 0.03 | < 0.001 |
| Systolic blood pressure, mmHg | 110.4 | 10.3 |  | 131.3 | 13.9 | < 0.001 |
| Diastolic blood pressure, mmHg | 70.8 | 7.2 |  | 91.1 | 9.2 | < 0.001 |

\* The *P* value of age was obtained from independent-samples *t* test, and the *P* values of other parameters were obtained by a univariate general linear model with age as a covariate.

**Supplemental Table 5** Changes from baseline to endpoint measures of biochemical indices within the normal-weight or obese group, and between groups

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Normal-weight (*n* 21) | | | | | |  | Obese (*n* 21) | | | | | |
| Baseline | |  | Endpoint | | *P* value | Baseline | |  | Endpoint | | *P* value |
| Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Triglycerides, mmol/l | 0.90 | 0.46 |  | 1.01 | 0.59 | 0.268 |  | 2.31\*\* | 1.72 |  | 2.27\*\*\* | 0.99 | 0.821 |
| Total cholesterol, mmol/l | 4.49 | 0.73 |  | 4.49 | 0.65 | 0.981 |  | 5.39\*\* | 0.93 |  | 5.12\*\* | 0.79 | 0.056 |
| LDL cholesterol, mmol/l | 2.70 | 0.58 |  | 2.71 | 0.50 | 0.935 |  | 3.45\*\* | 0.72 |  | 3.36\*\* | 0.69 | 0.408 |
| HDL cholesterol, mmol/l | 1.42 | 0.24 |  | 1.41 | 0.26 | 0.713 |  | 1.25\* | 0.20 |  | 1.16\*\* | 0.18 | 0.036 |
| Serum uric acid, μmol/l | 335.6 | 61.2 |  | 361.9 | 74.5 | 0.014 |  | 396.4\*\* | 77.5 |  | 409.5\* | 73.6 | 0.353 |
| Serum creatinine, μmol/l | 91.9 | 12.3 |  | 93.3 | 11.7 | 0.129 |  | 90.8 | 9.3 |  | 89.9 | 9.4 | 0.541 |
| Blood calcium, mmol/l | 1.40 | 0.17 |  | 1.50 | 0.18 | 0.054 |  | 1.42 | 0.16 |  | 1.50 | 0.17 | 0.054 |
| Alkaline phosphatase, IU/l | 72.7 | 16.0 |  | 77.2 | 18.3 | 0.051 |  | 69.0 | 21.3 |  | 71.4 | 25.9 | 0.213 |
| Aspartate aminotransferase, IU/l | 23.8 | 5.9 |  | 25.1 | 5.7 | 0.220 |  | 24.5 | 4.8 |  | 27.1 | 6.9 | 0.032 |

Mean values of the obese group were significantly different from those of the normal-weight group at the same stage: \**P* < 0∙05, \*\**P* < 0∙01, \*\*\**P* < 0∙001.