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| **Supplementary Table 1 Physical and metabolic characteristics on the spectrum from normal weight to varying degrees obesity in all the participants.** |
|  | **Normal** | **Overweight** | **Obesity Class I** | **Obesity Class II** | **Obesity Class III** | ***P*** |
| **Participants(n)** | 185 | 187 | 100 | 84 | 111 |  |
| **Demographics and anthropometrics** |  |  |  |  |  |
| Age (years) | 32.10±0.84 | 32.83±0.78 | 33.28±0.94 | 31.79±0.84 | 30.47±0.77 | 0.0654 |
|  Gender(male,n,%) | 59(31.9%) | 63(34.0%) | 33(33.0%) | 26(30.9%) | 45(40.5%) | 0.5371 |
| BMI (kg/m2) | 22.25±0.15 | 27.09±1.35 | 32.41±0.15 | 37.04±0.15 | 45.61±0.50 | <0.0001 |
| BAI  | 25.56±0.35 | 31.58±0.74 | 35.73±0.43 | 38.23±0.46 | 44.04±0.56 | <0.0001 |
| Waist circumference (cm)  | 84.02±0.56 | 96.50±7.47 | 103.4±1.27 | 112.4±1.10 | 128.6±1.26 | <0.0001 |
| Hip circumference (cm) | 95.05±0.97 | 108.0±0.94 | 114.8±0.94 | 123.1±0.72 | 137.9±1.13 | <0.0001 |
| WHR | 0.86±0.03 | 0.89±0.02 | 0.90±0.01 | 0.92±0.01 | 0.93±0.02 | 0.0702 |
| **Metabolic parameters** |  |  |  |  |
| HbA1c(%) | 5.38±0.11 | 5.58±0.06 | 5.49±0.04 | 5.52±0.04 | 6.01±0.43 | 0.7421 |
| Fasting glucose (mmol/L) | 5.35±0.03 | 5.57±0.04 | 5.29±0.08 | 5.43±0.08 | 5.53±0.07 | 0.0001 |
| Fasting Insulin (μIU/ml) | 23.46±1.64 | 14.64±0.57 | 22.17±1.43 | 27.93±1.44 | 25.65±2.03 | <0.0001 |
| Fasting FFA (mmol/L) | 0.41±0.02 | 0.43±0.05 | 0.62±0.03 | 0.69±0.03 | 0.68±0.03 | 0.0015 |
| Triglyceride (mmol/L) | 1.28±0.06 | 1.93±0.10 | 2.03±0.15 | 2.09±0.17 | 1.91±0.10 | <0.0001 |
| TC (mmol/L) | 4.85±0.06 | 5.12±0.07 | 4.86±0.08 | 4.89±0.08 | 4.84±0.87 | 0.0114 |
|  LDL-C (mmol/L) | 2.78±0.05 | 3.01±0.06 | 3.00±0.06 | 3.13±0.07 | 3.16±0.06 | <0.0001 |
|  HDL-C (mmol/L) | 1.32±0.02 | 1.16±0.02 | 1.08±0.03 | 1.10±0.02 | 1.03±0.02 | <0.0001 |
| Uric acid(μmol/L) | 341.3±6.06 | 407.8±5.96 | 426.1±10.75 | 435.6±16.32 | 476.4±17.02 | <0.0001 |
| Adipo-IR | 66.02±8.47 | 69.13±4.31 | 101.8±9.98 | 142.5±11.65 | 177.8±9.89 | <0.0001 |
| HOMA-IR | 2.51±0.10 | 3.88±0.16 | 5.47±0.28 | 6.96±0.41 | 9.50±0.55 | <0.0001 |
| HOMA-β | 115.7±4.27 | 157.0±6.61 | 281.2±16.07 | 343.4±30.6 | 426.9±29.45 | <0.0001 |
| GH (ng/ml) | 0.39±0.04 | 0.28±0.07 | 0.22±0.04 | 0.18±0.03 | 0.15±0.03 | <0.0001 |
| **Liver function parameters** |  |  |  |  |  |  |
| ALT (IU/L) | 21.92±1.64 | 34.38±1.64 | 43.47±3.21 | 54.13±5.25 | 57.65±5.33 | <0.0001 |
| AST (IU/L) | 19.78±0.43 | 23.24±0.60 | 25.22±1.44 | 29.27±1.81 | 31.84±2.95 | <0.0001 |
| **Inflammatory biomarker** |  |  |  |  |  |  |
| hsCRP(mg/L) | 0.46±0.09 | 1.18±0.14 | 4.57±0.51 | 6.41±0.61 | 10.26±0.78 | <0.0001 |
| Data are expressed as mean ± SEM. Statistical significance was defined as *p* < 0.05.a,e,i Compared with normal; b,f,j Compared with overweight; c,g,kCompared with Obesity Class I; d,h,l Compared with Obesity Class II.Abbreviations: BMI, body mass index; BAI, body adiposity index; WHR, waist-to-hip ratio; HbA1c, glycosylated hemoglobin; FFA, free fatty acid; TC, Total cholesterol; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; Adipo-IR, adipose tissue insulin resistance; HOMA-IR, homeostasis model assessment of insulin resistance index; HOMA-β, homeostasis model assessment of β-cell function; GH, growth hormone; ALT, alanine aminotransferase; AST, aspartate aminotransferase; hsCRP, high sensitivity C reactive protein. |