**Supplemental table 1.** Baseline cardiovascular magnetic resonance, cardiopulmonary exercise testing and echocardiographic data in subjects with type 2 diabetes versus controls.

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| --- | --- | --- | --- |
|  | **T2D (n=247)** | **CONTROLS (n=78)** | ***P*-value** |
| **Cardiovascular magnetic resonance imaging** | | | |
| LV EDVi, mL/m2 | 68±12 | 81±15 | **<0.001** |
| LV ESVi, mL/m2 | 23±7 | 28±9 | **<0.001** |
| LV EF, % | 67±7 | 66±6 | 0.055 |
| LV mass, g | 119±27 | 112±31 | **0.011** |
| LV MI, g/m2.7 | 29±5 | 26±5 | **<0.001** |
| LV mass:volume, g/mL | 0.84±0.14 | 0.76±0.11 | **<0.001** |
| LV global longitudinal strain, % | −16.2±2.4 | −17.4±1.9 | **<0.001** |
| LV PEDSR, s-1 | 1.02±0.23 | 1.05±0.22 | 0.206 |
| Min. indexed LA vol., mL/m2 | 14±5 | 18±6 | **<0.001** |
| Max indexed LA vol., mL/m2 | 31±9 | 43±12 | **<0.001** |
| LA EF, % | 55±11 | 56±13 | 0.278 |
| Myocardial perfusion reserve | 2.60±1.24 | 3.54±1.15 | **<0.001** |
| Aortic distensibility, mmHg-1x10-3 | 2.75 (1.74 - 4.03) | 4.92 (2.65 - 7.13) | **<0.001** |
| LGE present, n (%) | 35 (14) | 12 (15) | 0.740 |
| **Echocardiography** |  |  |  |
| E/A ratio | 0.84 (0.66 - 1.05) | 1.10 (0.83 - 1.23) | **0.006** |
| Average E/e' | 7.1 (3.1 – 9.4) | 7.1 (5.2 - 8.3) | 0.478 |
| **Cardiopulmonary exercise testing** | | | |
| Peak VO2, mL/kg/min | 18.0±6.6 | 27.8±9.0 | **<0.001** |
| Peak VO2, L/min | 1.74±0.70 | 1.99±0.70 | **0.002** |

Data are mean±SD or median (IQR). Abbreviations: EDVi=end-diastolic volume indexed to body surface area; ESVi=end-systoic volume indexed to body surface area; EF=ejection fraction; LA= left atrium; LGE=late gadolinium enhancement; LV=left ventricle; MBF=myocardial blood flow; MI=mass indexed to height; PEDSR=peak early diastolic strain rate; T2D=type 2 diabetes. Bold typeface indicates p<0.05.

Supplemental table 2. Correlations between bio-anthropometrics, measures of cardiac structure and function, and peak VO2.

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| --- | --- | --- | --- | --- |
|  | **T2Ds (n=224)** | | **Controls (n=78)** | |
|  | **Correlation coefficient (r)** | **P-value** | **Correlation coefficient (r)** | **P-value** |
| Age | −0.346 | **<0.001** | −0.652 | **<0.001** |
| T2D duration | −0.246 | **<0.001** | N/A | N/A |
| Systolic blood pressure | −0.142 | **0.036** | −0.122 | 0.289 |
| Diastolic blood pressure | −0.018 | 0.813 | −0.219 | 0.054 |
| HbA1c | 0.065 | 0.338 | −0.035 | 0.762 |
| E/A ratio | -0.076 | 0.361 | 0.246 | 0.052 |
| Average E/e’ | -0.393 | **<0.001** | -0.524 | **<0.001** |
| LV EDVi | 0.204 | **0.002** | 0.571 | **<0.001** |
| LV ESVi | 0.244 | **<0.001** | 0.497 | **<0.001** |
| LV ejection fraction | −0.191 | **0.004** | −0.299 | **0.008** |
| LV mass | 0.226 | **0.001** | 0.31 | **0.005** |
| LV mass/volume | 0.074 | 0.277 | −0.098 | 0.392 |
| Minimum indexed LA volume | −0.010 | 0.886 | 0.283 | **0.012** |
| Maximum indexed LA volume | −0.066 | 0.33 | 0.31 | **0.006** |
| LA ejection fraction | −0.069 | 0.306 | 0.049 | 0.67 |
| LV global longitudinal strain | 0.158 | **0.019** | 0.176 | 0.123 |
| LV peak early diastolic strain rate | 0.093 | 0.188 | 0.232 | **0.041** |
| Myocardial perfusion reserve | 0.301 | **<0.001** | 0.304 | **0.007** |
| Aortic distensibility | −0.089 | 0.223 | 0.46 | **<0.001** |

\*Excluding subjects with peak RER<1 on CPET. Abbreviations: BP=blood pressure; EDV=end-diastolic volume; EF=ejection fraction; ESV=end-systolic volume; LV=left ventricle. Bold typeface indicates p<0.05.

**Supplemental table 3.** Associations of bio-anthropometric characteristics with peak VO2 in people with type 2 diabetes and controls, and associations measures of cardiac structure and function with peak VO2, added individually to the base model containing age, sex, ethnic group, smoking status and systolic blood pressure.

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| --- | --- | --- | --- | --- | --- | --- |
|  | **T2Ds (n=224)** | | | **Controls (n=78)** | | |
|  | **β** | **95% CI** | **P-value** | **Β** | **95% CI** | **P-value** |
| Age | −0.195 | −0.260 to −0.130 | **<0.001** | −0.448 | −0.578 to −0.318 | **<0.001** |
| Male sex | 3.537 | 2.147 to 4.928 | **<0.001** | 3.31 | 0.347 to 6.273 | **0.029** |
| White ethnicity | 1.878 | 0.422 to 3.334 | **0.011** | 4.915 | 1.638 to 8.193 | **0.003** |
| Never smoked | 1.406 | −0.563 to 3.375 | 0.161 | −5.920 | −13.308 to 1.468 | -0.116 |
| Systolic blood pressure | −0.035 | −0.082 to −0.012 | 0.144 | 0.04 | −0.047 to 0.127 | 0.369 |
|  | | | | | | |
| Average E/e’ | -0.385 | -0.594 to -0.176 | **<0.001** | -0.607 | 1.410 to 0.196 | 0.138 |
| LV end-diastolic volume | −0.010 | −0.034 to 0.014 | 0.429 | 0.082 | 0.036 to 0.129 | **<0.001** |
| LV ejection fraction | −0.108 | −0.209 to −0.007 | **0.037** | −0.297 | −0.529 to −0.064 | **0.012** |
| LV mass | 0.023 | −0.010 to 0.057 | 0.175 | 0.129 | 0.072 to 0.185 | **<0.001** |
| LV global longitudinal strain | 0.265 | 0.004 to 0.526 | **0.046** | 0.525 | −0.256 to 1.307 | 0.188 |
| Myocardial perfusion reserve | 0.798 | −0.235 to 1.360 | **0.005** | 0.78 | −0.531 to 2.092 | 0.243 |
| Mean aortic distensibility | N/A | N/A | N/A | −0.307 | −0.051 to 0.124 | 0.466 |
| Maximum indexed LA volume | N/A | N/A | N/A | 0.092 | −0.019 to 0.203 | 0.104 |
| LV peak early diastolic strain rate | N/A | N/A | N/A | 1.062 | −6.628 to 8.753 | 0.787 |

\*Excluding subjects with peak RER<1 on CPET. Abbreviations: CI=confidence interval; LA=left atrium; LV=left ventricle; N/A=not applicable due to no significant correlation demonstrated; T2D=type 2 diabetes. Bold typeface indicates p<0.05.

**Supplemental table 4.** Multivariable associations between measures of cardiac structure and function with peak VO2 in people with type 2 diabetes, including HbA1c.

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| --- | --- | --- | --- |
|  | **T2Ds (n=224)** | | |
|  | **β** | **95% CI** | **P-value** |
| Age | -0.110 | -0.179 to -0.041 | **0.002** |
| Male sex | 2.352 | 0.898 to 3.806 | **0.002** |
| White ethnicity | 1.425 | -0.030 to 2.880 | 0.055 |
| Smoking history (ref: never smoked) | 2.041 | 0.197 to 3.885 | **0.030** |
| Systolic blood pressure | -0.018 | -0.063 to 0.027 | 0.427 |
| HbA1c | -0.189 | -0.782 to 0.403 | 0.531 |
| LV ejection fraction | -0.043 | -0.153 to 0.066 | 0.436 |
| LV global longitudinal strain | 0.266 | -0.061 to 0.514 | 0.123 |
| Myocardial perfusion reserve | 0.808 | 0.217 to 1.399 | **0.008** |
| Average E/e’ | -0.383 | -0.592 to -0.174 | **<0.001** |

Abbreviations: CI=confidence interval; LV=left ventricle; T2D=type 2 diabetes