**Supplementary Table S1. Characteristics of 10,138 men in the NEDA cohort identified with phenotypical HCM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Men** | **ALL HCM** | **ASH** | **oHCM** |
| **10,138 cases** | **3,473 cases** | **1,432 cases** |
| **Demographic** | | | |
| Age at last echo (years) | 69.52 ± 14.48 | 68.57 ± 15.10 | 76.36 ± 11.82 |
| BMI (kg/m2) | 29.96 ± 6.44 | 28.99 ± 5.75 | 228.92 ± 5.72 |
| **LV Dimensions/Function** | | | |
| IV Septal thickness | 1.62 ± 0.23 | 1.75 ± 0.27 | 1.62 ± 0.18 |
| IV Septal thickness ≥15mm % | 91.35% | 100.00% | 93.99% |
| LV Posterior Wall Dimensions | 1.36 ± 0.28 | 1.08 ± 0.19 | 1.41 ± 0.25 |
| LV Posterior Wall Dimensions ≥15mm % | 41.72% | 2.45% | 53.21% |
| LV diastolic diameter | 4.67 ± 0.77 | 4.56 ± 0.80 | 4.77 ± 0.73 |
| LV diastolic diameter <5.5cm % | 84.32% | 87.42% | 81.98% |
| Septal to Posterior Wall Ratio | 1.26 ± 0.39 | 1.67 ± 0.38 | 1.19 ± 0.31 |
| Septal to Posterior Wall Ratio >1.3 % | 34.26% | 100.00% | 24.93% |
| LVOT/AV Peak Gradient\* | 21.08 ± 23.60 | 16.58 ± 18.67 | 59.15 ± 25.91 |
| LVOT/AV Peak Gradient\* ≥30mmHg % | 20.78% | 14.43% | 100.00% |
| LVEF | 60.36 ± 14.52 | 57.76 ± 13.60 | 63.15 ± 14.54 |
| LVEF <55% | 28.04% | 30.93% | 22.07% |
| LVEF ≥55% | 71.96% | 69.07% | 77.93% |
| Mitral E wave velocity, | 83.82 ± 31.93 | 79.67 ± 29.73 | 96.03 ± 36.71 |
| Mitral E wave velocity >90cm/s % | 34.25% | 29.61% | 49.14% |
| LV septal e’ velocity | 6.28 ± 2.22 | 6.13 ± 2.19 | 6.17 ± 2.22 |
| LV septal e’ velocity <9cm/s % | 84.49% | 87.37% | 84.77% |
| Mitral E:e’ ratio | 13.73 ± 6.09 | 13.22 ± 5.77 | 15.50 ± 6.84 |
| Mitral E:e’ ratio >9 % | 82.16% | 77.67% | 90.58% |
| Left atrial volume index, ml/m2 | 59.71 ± 36.22 | 50.45 ± 27.59 | 72.57± 41.78 |
| Left atrial volume index, >34ml/m2 % | 76.47% | 72.18% | 86.73% |
| Moderate-to-Severe mitral regurgitation, % | 13.18% | 15.14% | 15.85% |

**Legend**: \*Continuous-Wave Doppler Evaluation of LVOT/AV velocities; asymmetric septal hypertrophy (ASH) defined as septal to posterior wall thickness ratio >1.3; obstructive hypertrophic cardiomyopathy (oHCM) defined as any increase in LVOT/AV velocities corresponding to a peak gradient ≥30mmHg.

**Supplementary Table S2. Characteristics of 5,242 women in the NEDA cohort identified with phenotypical HCM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Women** | **ALL HCM** | **ASH** | **oHCM** |
|  | **5,242 cases** | **2,079cases** | **844 cases** |
| **Demographic** |  |  |  |
| Age at last echo (years) | 74.05 ± 14.31 | 70.96 ± 15.26 | 79.62 ± 11.55 |
| BMI (kg/m2) | 29.69 ± 8.18 | 28.42 ± 7.03 | 28.44 ± 7.15 |
| **LV Dimensions/Function** |  |  |  |
| IV Septal thickness | 1.63 ± 0.24 | 1.75 ± 0.27 | 1.62 ± 0.20 |
| IV Septal thickness ≥15mm % | 91.42% | 100.00% | 92.06% |
| LV Posterior Wall Dimensions | 1.33 ± 0.30 | 1.05 ± 0.19 | 1.41 ± 0.25 |
| LV Posterior Wall Dimensions ≥15mm % | 39.24% | 1.49% | 52.49% |
| LV diastolic diameter | 4.09 ± 0.76 | 3.95 ± 0.72 | 4.22 ± 0.74 |
| LV diastolic diameter <5.5cm % | 95.86% | 97.45% | 94.08% |
| Septal to Posterior Wall Ratio | 1.30 ± 0.43 | 1.71 ± 0.41 | 1.20 ± 0.32 |
| Septal to Posterior Wall Ratio >1.3 % | 39.66% | 100.00% | 26.90% |
| LVOT/AV Peak Gradient\* | 24.27 ± 26.54 | 18.54 ± 20.92 | 61.66 ± 28.94 |
| LVOT/AV Peak Gradient\* ≥30mmHg % | 24.83% | 15.75% | 100.00% |
| LVEF | 64.91 ± 14.22 | 61.81 ± 13.00 | 67.76 ± 14.81 |
| LVEF <55% | 18.22% | 20.34% | 15.37% |
| LVEF ≥55% | 81.78% | 79.66% | 84.63% |
| Mitral E wave velocity, | 89.92 ± 35.31 | 87.44 ± 34.54 | 105.52 ± 41.58 |
| Mitral E wave velocity >90cm/s % | 41.49% | 37.31% | 58.45% |
| LV septal e’ velocity | 5.78 ± 2.14 | 5.50 ± 2.09 | 5.66 ± 2.03 |
| LV septal e’ velocity <9cm/s % | 87.30% | 93.30% | 86.57% |
| Mitral E:e’ ratio | 16.06 ± 7.78 | 16.61± 8.16 | 18.81 ± 9.55 |
| Mitral E:e’ ratio >9 % | 88.41% | 89.30% | 93.27% |
| Left atrial volume index, ml/m2 | 60.74 ± 34.38 | 49.33 ± 25.86 | 774.39 ± 38.92 |
| Left atrial volume index, >34ml/m2 % | 77.76% | 71.19% | 89.51% |
| Moderate-to-Severe mitral regurgitation, % | 19.89% | 24.56% | 25.75% |

**Legend**: \*Continuous-Wave Doppler Evaluation of LVOT/AV velocities; asymmetric septal hypertrophy (ASH) defined as septal to posterior wall thickness ratio >1.3; obstructive hypertrophic cardiomyopathy (oHCM) defined as any increase in LVOT/AV velocities corresponding to a peak gradient ≥30mmHg.

**Supplementary Table S3. Specific characteristics of Obstructive HCM cases within the NEDA cohort**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **HCM cases with LVOTO profiling** | **HCM Phenotype** | **Evidence of oHCM** | **Mild oHCM** | **Severe oHCM** |
| **10,290 cases** | **2,276 cases** | **1,066 cases** | **1,210 cases** |
| **Demographic** | | | | |
| Men % | 66.97% | 62.92% | 62.85% | 62.98% |
| Age at last echo (years) | 72.24 ± 14.20 | 77.57 ± 11.82 | 76.32 ± 11.66 | 78.67 ± 11.86 |
| BMI (kg/m2) | 29.43 ± 6.80 | 28.74 ± 6.29 | 29.28 ± 6.35 | 28.28 ± 6.20 |
| **LV Dimensions/Function** | | | | |
| IV Septal thickness | 1.62 ± 0.22 | 1.62 ± 0.19 | 1.62 ± 0.19 | 1.62 ± 0.19 |
| IV Septal thickness ≥15mm % | 90.74% | 93.28% | 93.71% | 92.89% |
| LV Posterior Wall Dimensions | 1.34 ± 0.29 | 1.41 ± 0.25 | 1.39 ± 0.25 | 1.43 ± 0.24 |
| LV Posterior Wall Dimensions ≥15mm % | 37.40% | 52.94% | 48.87% | 56.53% |
| LV diastolic diameter | 4.47 ± 0.78 | 4.57 ± 0.78 | 4.54 ± 0.77 | 4.59 ± 0.79 |
| LV diastolic diameter <5.5cm % | 89.81% | 86.47% | 87.24% | 85.79% |
| Septal to Posterior Wall Ratio | 1.28 ± 0.39 | 1.19 ± 0.31 | 1.21 ± 0.32 | 1.18 ± 0.31 |
| Septal to Posterior Wall Ratio >1.3 % | 38.05% | 25.66% | 28.14% | 23.47% |
| LVOT/AV Peak Gradient\* | 22.13 ± 24.65 | 60.08 ± 27.09 | 38.46 ± 5.62 | 79.13 ± 24.04 |
| LVOT/AV Peak Gradient\* ≥30mmHg % | 22.12% | 100.00% | 100.00% | 100.00% |
| LVEF | 59.90 ± 13.96 | 64.86 ± 14.81 | 64.90 ± 14.73 | 64.83 ± 14.88 |
| LVEF <55% | 27.91% | 19.58% | 18.85% | 20.22% |
| LVEF ≥55% | 72.09% | 80.42% | 81.15% | 79.78% |
| Mitral E wave velocity, | 87.33 ± 34.80 | 99.54 ± 38.84 | 98.79 ± 39.35 | 100.20 ± 38.39 |
| Mitral E wave velocity >90cm/s % | 38.12% | 52.57% | 52.27% | 52.84% |
| LV septal e’ velocity | 8.94 ± 2.15 | 5.98 ± 2.17 | 6.15 ± 2.26 | 5.83 ± 2.07 |
| LV septal e’ velocity <9cm/s % | 88.69% | 85.43% | 83.39% | 87.28% |
| Mitral E:e’ ratio | 15.25 ± 7.48 | 16.73 ± 8.11 | 16.16 ± 7.76 | 17.24 ± 8.39 |
| Mitral E:e’ ratio >9 % | 83.90% | 91.58% | 90.21% | 92.79% |
| Left atrial volume index, ml/m2 | 54.79 ± 32.14 | 73.23 ± 40.76 | 71.41 ± 40.11 | 74.85 ± 41.28 |
| Left atrial volume index, >34ml/m2 % | 74.78% | 87.75% | 85.54% | 89.70% |
| Moderate-to-Severe mitral regurgitation, % | 16.03% | 19.49% | 17.39% | 21.26% |

**Legend**: \*Continuous-Wave Doppler Evaluation of LVOT/AV velocities; LVOT obstruction (LVOTO); obstructive hypertrophic cardiomyopathy (oHCM) defined as any increase in LVOT/AV velocities corresponding to a peak gradient ≥30mmHg.

**Supplementary Table S4. Cases of the HCM Phenotype in the NEDA cohort with LVEF above and below 55%**

|  |  |  |  |
| --- | --- | --- | --- |
| **HCM Cases with LVEF** | **HCM Phenotype** | **LVEF <55%** | **LVEF >=55%** |
| **13,715 cases** | **3,389 cases** | **10,326 cases** |
| **Demographic** | | | |
| Men % | 66.11% | 75.01% | 63.19% |
| Age at last echo (years) | 71.76 ± 14.14 | 73.33 ± 13.98 | 71.25 ± 14.14 |
| BMI (kg/m2) | 29.93 ± 7.10 | 28.91 ± 6.72 | 30.25 ± 7.19 |
| **LV Dimensions/Function** | | | |
| IV Septal thickness | 1.62 ± 0.22 | 1.61 ± 0.23 | 1.62 ± 0.22 |
| IV Septal thickness ≥15mm % | 91.07% | 87.46% | 92.25% |
| LV Posterior Wall Dimensions | 1.36 ± 0.28 | 1.34 ± 0.31 | 1.36 ± 0.27 |
| LV Posterior Wall Dimensions ≥15mm % | 42.62% | 38.77% | 43.89% |
| LV diastolic diameter | 4.54 ± 0.79 | 4.81 ± 0.82 | 4.45± 0.76 |
| LV diastolic diameter <5.5cm % | 87.45% | 79.05% | 90.21% |
| Septal to Posterior Wall Ratio | 1.26 ± 0.39 | 1.28± 0.43 | 1.25 ± 0.37 |
| Septal to Posterior Wall Ratio >1.3 % | 34.30% | 37.44% | 33.27% |
| LVOT/AV Peak Gradient\* | 22.34 ± 24.82 | 17.82 ± 21.78 | 24.09 ± 25.69 |
| LVOT/AV Peak Gradient\* ≥30mmHg % | 22.47% | 15.76% | 25.06% |
| LVEF | 61.90 ± 14.58 | 42.58 ± 9.51 | 68.24 ± 9.47 |
| Mitral E wave velocity, | 85.97 ± 33.30 | 87.82 ± 34.83 | 85.42 ± 32.82 |
| Mitral E wave velocity >90cm/s % | 36.77% | 41.58% | 35.35% |
| LV septal e’ velocity | 6.13 ± 2.21 | 5.42 ± 2.10 | 6.30 ± 2.20 |
| LV septal e’ velocity <9cm/s % | 85.23% | 94.02% | 83.12% |
| Mitral E:e’ ratio | 14.46 ± 6.77 | 16.62 ± 8.28 | 13.96 ± 6.26 |
| Mitral E:e’ ratio >9 % | 84.22% | 87.34% | 83.49% |
| Left atrial volume index, ml/m2 | 60.14 ± 35.70 | 57.18 ± 31.17 | 60.98 ± 36.84 |
| Left atrial volume index, >34ml/m2 % | 76.91% | 81.97% | 75.47% |
| Moderate-to-Severe mitral regurgitation, % | 15.08% | 23.10% | 12.40% |

**Legend**: \*Continuous-Wave Doppler Evaluation of LVOT/AV velocities; left ventricular ejection fraction (LVEF)

**Supplementary Table S5. Characteristics of phenotypical HCM Cases within the NEDA cohort detailing aortic stenosis interaction with oHCM**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All NEDA Patients** | **LVOT and AV Subgroup\*** | **oHCM** | |
| High AV gradients and normal LVOT velocities # | High AV gradients and elevated LVOT velocities ǂ |
|  | N=303548 | N=268430 | N=898 | N=9463 |
| **Demographic** | | | | |
| Men % | 51.28% | 51.03% | 61.37% | 56.54% |
| Age at last echo (years) | 61.57±17.79 | 62.01±17.76 | 81.24±10.68 | 75.03±13.81 |
| BMI (kg/m2) | 28.02±6.27 | 28.06±6.25 | 26.05±5.63 | 28.05±6.10 |
| **LV Dimensions/Function** | | | | |
| IV Septal thickness | 1.05±0.23 | 1.06±0.23 | 1.24±0.25 | 1.22±0.25 |
| IV Septal thickness ≥15mm % | 4.63% | 4.56% | 15.37% | 14.55% |
| LV Posterior Wall Dimensions | 1.01±0.20 | 1.01±0.20 | 1.15±0.23 | 1.13±0.21 |
| LV Posterior Wall Dimensions ≥15mm % | 2.07% | 2.15% | 7.46% | 6.29% |
| LV diastolic diameter | 4.70±0.70 | 4.74±0.68 | 4.94±0.86 | 4.60±0.70 |
| LV diastolic diameter <5.5cm % | 87.71% | 87.10% | 72.94% | 89.73% |
| Septal to Posterior Wall Ratio | 1.06±0.19 | 1.06±0.19 | 1.09±0.24 | 1.09±0.20 |
| Septal to Posterior Wall Ratio >1.3 % | 7.37% | 7.27% | 11.58% | 10.99% |
| LVEF | 62.30±11.77 | 62.32±11.80 | 45.09±15.76 | 61.84±11.02 |
| LVEF <55% | 15.03% | 15.88% | 65.59% | 17.03% |
| LVEF ≥55% | 77.01% | 81.35% | 30.85% | 79.63% |
| Mitral E wave velocity, | 80.26±25.51 | 80.45±25.64 | 98.45±38.50 | 96.72±35.63 |
| Mitral E wave velocity >90cm/s % | 22.67% | 24.48% | 39.98% | 42.12% |
| LV septal e’ velocity | 8.37±3.00 | 8.35±3.00 | 5.55±2.27 | 6.49±2.19 |
| LV septal e’ velocity <9cm/s % | 25.71% | 27.08% | 2.78% | 8.82% |
| Mitral E:e’ ratio | 10.40±4.81 | 10.45±4.84 | 18.36±9.39 | 15.42±7.63 |
| Mitral E:e’ ratio >9 % | 30.02% | 32.20% | 33.18% | 44.53% |
| Left atrial volume index, ml/m2 | 43.67±31.13 | 44.57±31.80 | 53.57±23.21 | 42.17±18.38 |
| Left atrial volume index, >34 ml/m2 % | 21.88% | 23.72% | 36.75% | 27.85% |
| Moderate-to-Severe mitral regurgitation, % | 5.53% | 5.83% | 22.05% | 10.31% |

**Legend:**

\*All patients must have both a valid AV peak gradient and LVOT peak velocity to be included

# AV Peak Gradient ≥ 30mmHg AND LVOT peak velocity < 2.0m/s;

ǂ AV Peak Gradient ≥ 30mmHg AND LVOT peak velocity >= 2.0m/s.

This table shows a sensitivity analysis of the potential for aortic stenosis to interact with oHCM. Aortic stenosis typically has normal (or low) LVOT velocities, as opposed to oHCM where the velocity elevation is found in the LVOT and not the aortic valve. The first column summarises the characteristics of the whole NEDA population. The second column summarises the characteristics of all individuals with HCM. The third column shows HCM patients with high AV gradients and normal LVOT velocities, many of whom may have aortic stenosis noting that image review has not been performed to clarify which of these patients have AS vs LVOT obstruction. The final column shows Patients with HCM, high AV gradients and elevated LVOT velocities, most of whom are assumed to have oHCM.

**Supplementary Figure S1. Projected ASH Cases Uncovered by Echo in Australia (2021)**





**Legend:** This graph shows the estimated distribution of specific asymmetric septal hypertrophy (ASH) cases (total of 5476 men and 3,191 women with ASH) based on the demographic/geographic distribution of the Australian population in 2021. ASH is defined as septal to posterior wall thickness ratio >1.3.