Echocardiographic wall motion abnormalities and mortality reported in 492,338 individuals

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Background: The prevalence of abnormal regional left ventricular function in the setting of myocardial ischaemia is incompletely studied, along with the relative frequency of individual wall motion abnormalities (WMA). We examined the prevalence and distribution of regional WMA in adults being investigated with echocardiography, and the association with mortality.

Methods: Routinely acquired echocardiographic reporting data and individually linked survival profiles were extracted from the Australia-wide, multicentre National Echocardiography Database of Australia. By applying natural language processing (NLP) to the cardiologist’s report of left ventricular (LV) function, we examined global and regional LV dysfunction.

Results: 492,338 (age 61.9±17.9) individuals (255,697 men aged 60.5±17.1 and 236,341 women aged 60.9±18.3 years) could be evaluated. 57,180 (17.6%) individuals were reported to have abnormal wall motion (39,346 men aged 69.0±13.4 yrs and 17,834 women, 71.3±14.3 yrs). The presence of a WMA was associated with increased left atrial volumes (LAVi: 55.5±36.4 vs 40.9±27.5 ml/m2 for women), impaired LVEF (50.8±15.1% vs 61.1±12.2% for women), impaired diastolic function (E’ 6.64±2.21 vs 8.25±2.86 cm/s for women), and higher pulmonary artery pressure (eRVSP 36.2±11.5 vs 32.5±10.7 mmHg). Most, but not all individuals had a history of myocardial infarction with or without revascularisation. An inferior WMA was the commonest, with 18,638 WMA reported (4.7%), followed by apical WMA (19,682; 3.4%), lateral WMA (16,976; 2.9%), septal WMA (15,722; 1.7%) and anterior WMA in 9,432 (1.6%). In men, long-term all-cause mortality for WMA was 40.5% (compared to 23.3% without), and in women 42.7% (vs 20.5%). These WMA observations were magnified in those >65 years and with impaired systolic function. The presence of akinesis/dyskinesis/aneurysm of any wall fared worse than hypokinesis (OR 1.34 CI:1.22-1.44 P<0.001 for Inferior WMA). Females with a WMA had less mortality (OR 0.80 CI: 0.74 – 0.85; P, 0.001), and any revascularisation was protective (OR 0.76 CI 0.46 – 0.69 P<0.001).

Conclusion: WMA are reported in men at greater than twice more frequently than women, and overall contribute almost a fifth of echocardiographic reports. The presence of a WMA is associated with impaired LV systolic and diastolic function, signs of increased LV filling pressure and pulmonary pressure, and high long-term mortality that is partially ameliorated by revascularisation. Prognosis is affected by the presence, extent and severity of WMA.