Summary 20

Poor long-term survival in patients with moderate aortic stenosis

Strange G, Stewart S, Celermajer D, Prior D, Scalia GM, Marwick T, Ilton M, Joseph M, Cidde J and Playford D.

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Key points

- Increasing age and left heart disease prevalence is associated with AS severity.
- Severe AS is associated with poor long-term survival.
- Less severe levels of AS have similar mortality rates as severe AS.

Background information

- Previous studies into mild to moderate AS have been limited by sample size and length of follow-up.
- Research has shown that 75% of patients with lower severity or asymptomatic AS require AVR or they die within 5 years.
- Overall, the progression and management of AS are currently poorly characterised.

Aim

- To determine the prognostic impact of increasing AS severity.

Type of study

- Retrospective cohort study.

Endpoints

- Short- and long-term mortality (1 and 5 years).

Methods

- A total of 241,303 patients from the National Echocardiographic Database of Australia (NEDA) observational registry were categorised according to AS severity using current diagnostic criteria:
  - No evidence of AS: mean gradient less than 10.0 mmHg and/or peak velocity less than 2.0 m/s and/or aortic valve area greater than 1 cm^2
  - Mild AS: mean gradient 10.0–19.9 mmHg and/or peak velocity 2.0–2.9 m/s and/or aortic valve area greater than 1 cm^2
  - Moderate AS: mean gradient 20.0–39.9 mmHg and/or peak velocity 3.0–3.9 m/s and/or aortic valve area greater than 1 cm^2
  - Severe AS (high-gradient): mean gradient greater than 40.0 mmHg and/or peak velocity greater than 4.0 m/s with or without an aortic valve area of 1 cm^2 or less
  - Severe AS (low-gradient): an aortic valve area of 1 cm^2 or less without high-gradient AS.
- The relationship between AS severity and mortality was assessed.
- Median follow-up was 1,208 days (interquartile range 598–2,177 days).
- Statistical distribution of aortic valve parameters and conventional AS severity definitions were applied during follow-up.
- Patients who had undergone AVR were excluded from the study.

Edwards

Results

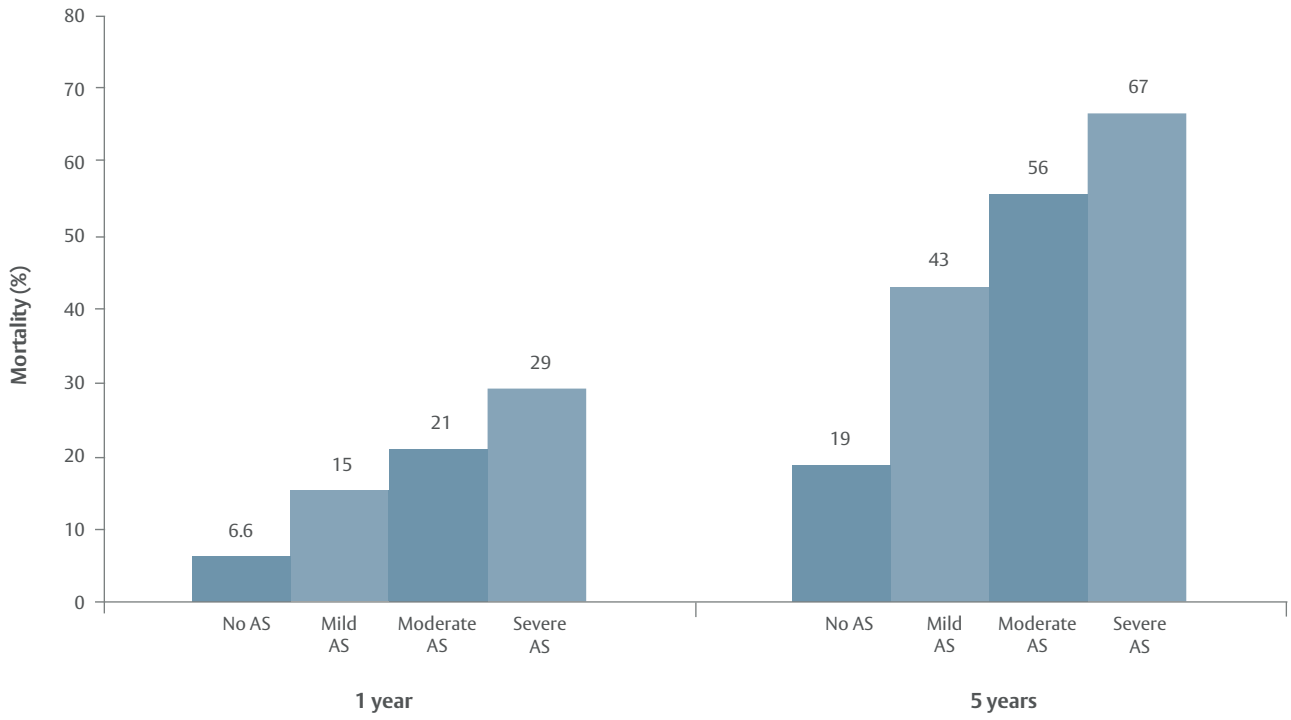
Patient characteristics

- Mean age was 61 ± 17 years for male patients (50.9%) and 62 ± 19 years for female patients (49.1%).
- Moderate to severe AS was present in 4% of patients (Table 1).
- High-gradient severe AS was more prevalent in men (52.2% male *vs* 47.8% female).
- Low-gradient severe AS was more prevalent in women (54.4% female *vs* 45.6% male).
- AS severity was associated with increasing age and left heart disease prevalence (p<0.001).

Table 1: Distribution of AS severity

AS severity	n	%
No evidence	215,476	89.3
Mild	16,129	6.7
Moderate	3,315	1.4
Severe (high-gradient)	2,668	1.1
Severe (low-gradient)	3,715	1.5

Figure 1: Mortality rates according to AS severity



AS severity and mortality

- A total of 44,235 deaths (18%) occurred at follow-up.
- Risk of long-term mortality increased in patients with mild to severe AS (Figure 1 [adjusted HR 1.44–2.09, p<0.001]).
- After adjusting for age, sex, left ventricular systolic or diastolic function and aortic regurgitation, 5-year mortality (all-cause) increased in patients with moderate AS.

Limitations

- Mortality rates may have been confounded by aortic regurgitation.
- Clinical details (such as coronary artery disease) that may influence AS are not included in the NEDA registry.
- Findings are not based on multiple echocardiographs.
- Symptom progression and guideline adherence could not be determined during the period between the patients' time of death or census and their last echocardiograph.

Conclusion

Severe AS is associated with high mortality, particularly when left untreated. Moderate AS is also associated with reduced long-term survival. Future research should investigate the factors contributing to increased mortality in moderate AS and develop interventions to address them.

This document is a summary of the Strange G et al. *paper and covers key information including aim, type of study, methods, results, limitations and conclusions.*

The full publication is available at:
http://bit.ly/Strange_AS

Abbreviations

AS: aortic stenosis
AVR: aortic valve replacement
HR: hazard ratio
NEDA: National Echocardiographic Database of Australia

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