Age-related differences in incidence of heart failure admission and loop diuretic use following surgery for mitral regurgitation: a nationwide cohort study

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Purpose

Data on age-related differences in postoperative heart failure burden following mitral valve surgery for mitral regurgitation are sparse. We aimed to investigate such differences, focusing on hospital admissions for heart failure and changes in loop diuretic use.

Methods

- **Danish National Patient Registry**
- **Danish Civil Registration System**
- **Danish National Prescription Registry**

All Danish residents ≥ 18 years of age discharged following first-time non-transcatheter mitral valve surgery for mitral regurgitation not related to endocarditis or acute ischemia between 1 January 1996 and 1 October 2022

- **5-year cumulative incidence** of heart failure admission using the Aalen-Johansen estimator
- **Cox proportional hazards regression** w/ adjustment for sex, type of surgery, calendar year and key comorbidities
- **Binary assessment of prescription redemption**

Results

Study population

- 6,840 patients (65.7% males)
- Median age 66.3 years
- 3,060 patients (44.7%) with neither prior heart failure nor loop diuretic use

Patient age (years)	*18-49*	*50-59*	*60-69*	*70-79*	*≥ 80*
Prior IHD	130 (15.5%)	403 (29.9%)	799 (37.6%)	991 (46.0%)	161 (42.9%)
Prior CHF	194 (23.1%)	383 (28.5%)	637 (30.0%)	708 (32.9%)	130 (34.7%)
Prior AF	193 (22.9%)	411 (30.5%)	862 (40.6%)	1067 (49.6%)	196 (52.3%)
Prior loop diuretics	235 (27.9%)	520 (38.6%)	976 (45.9%)	1187 (55.1%)	241 (64.3%)
Mitral valve repair	547 (65.0%)	938 (69.7%)	1488 (70.0%)	1386 (64.4%)	203 (54.1%)

Table 1: *Select baseline characteristics of the study population according to age groups, with in-group percentages. IHD = ischemic heart disease, CHF = congestive heart failure, AF = atrial fibrillation/flutter*

5-year cumulative incidence of postoperative heart failure admission

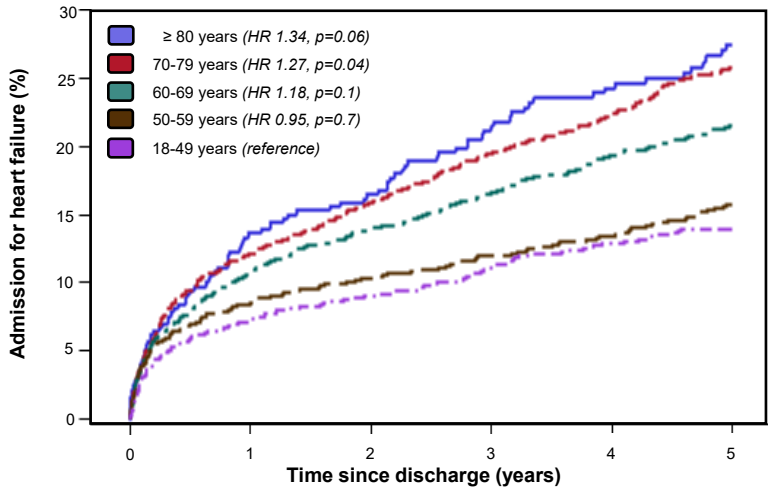

Figure 1: *The 5-year cumulative incidence of hospital admission for heart failure following discharge for first-time mitral valve surgery for mitral regurgitation according to age groups, along with their associated adjusted hazard ratio using patients aged 18-49 years as reference*

Pre- and postoperative loop diuretic use

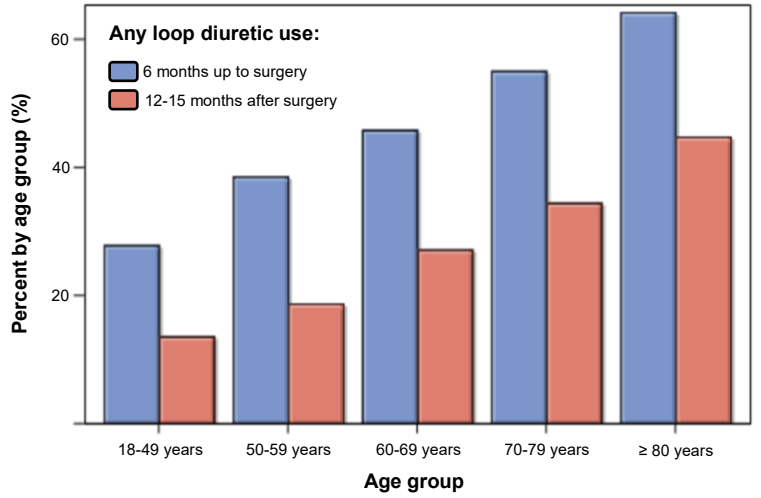

Figure 2: *The proportion of patients with a redeemed loop diuretic prescription within 6 months before surgery and within 12-15 months after surgery in surviving patients, according to age groups. The corresponding proportion of deceased patients at 15 months were 1.0%, 2.6%, 3.8%, 5.6%, and 7.2% for ascending age groups.*

Conclusions

- **Postoperative 5-year cumulative incidence of hospital admission for heart failure revealed a clear age gradient, ranging 13.9% to 27.4%**
- **Loop diuretic use declined within the first year following surgery but remained substantial, especially among older patients, ranging 13.5% to 41.6%**

Our findings may help guide patient selection and counselling, emphasizing the importance of age-tailored postoperative monitoring

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