

Incidence and Clinical Impact of Delirium after Transcatheter Aortic Valve Implantation in Japan: An interim report

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Background & Aims

- Transcatheter aortic valve implantation (TAVI) is widely performed in elderly patients with severe aortic stenosis who are at high surgical risk. The incidence of delirium after TAVI has been reported to range from 12%-53%, and there have been several reports of risk factors for delirium after TAVI[1,2], however, there are few reports on how delirium is treated for such highly geriatric population.
- Antipsychotics commonly used in the treatment of delirium carry the risk of various adverse drug events (ADEs), which are even higher in the elderly[3]. In recent years, dexmedetomidine (DEX) has been reported to be effective in the prevention and treatment of delirium[4].
- We conducted a retrospective cohort study to determine the incidence of delirium after TAVI and pharmacological treatment including DEX and antipsychotics for delirium after TAVI in real-world practice.

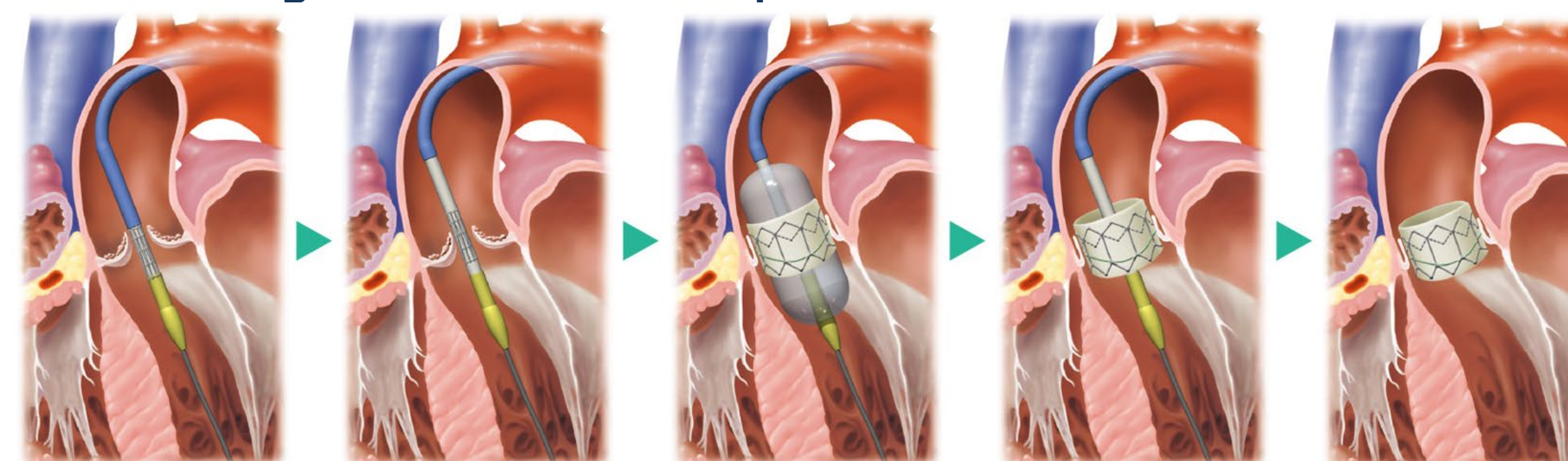
Methods

Study Design / Participants / Outcomes

- Study Design & Participants:** This retrospective cohort study was conducted among all patients enrolled in the TAVI registry of the Department of Cardiovascular Medicine, Kyoto Prefectural University of Medicine, who underwent TAVI between January 1, 2017, and December 31, 2020.
- Data collection:** Three psychiatrists evaluated the occurrence and duration of delirium after TAVI through a retrospective chart review. They also collected the information about comorbidities of patients, death after TAVI, and medication use for the delirium.
- Outcome measures:** The primary objective is the incidence of delirium after TAVI. The diagnosis of delirium is based on clinical assessment and is guided by Diagnostic Statistical Manual of Mental Disorders, fifth edition (DSM-5). Secondary objective was medication for the delirium. We also investigated the impact of delirium on all-cause mortality after TAVI.
- This study was approved by the institutional review boards of the Kyoto Prefectural University of Medicine.

About Transcatheter aortic valve Implantation (TAVI)

- Transcatheter aortic valve implantation (TAVI) is a minimally invasive cardiac procedure that uses a catheter to replace a thickened aortic valve as a treatment for aortic stenosis. TAVI may be an option for people at risk of complications from surgical aortic valve replacement.



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About Dexmedetomidine (DEX)

- Dexmedetomidine (DEX) is a highly selective and potent α_2 -adrenergic agonist. It has a potential role as a sedative because it can calm and easily arouse ICU patients without causing respiratory depression.
- DEX also has anxiolytic, analgesic, and anti-inflammatory properties, and may modulate the stress response to illness.

Results (Analysis of 285 out of 392 total participants)

Demographics and Outcomes (285 patients)

Demographics	
Age (mean, SD)	86.0 (5.0)
Male (n,%)	81 (28)
All length of hospital stay (median, IQR)	17 (15-23)
Length of hospital stay after TAVI (median, IQR)	11 (9-14)
Duration of TAVI procedure (median, IQR)	92 (78-115)
Clinical Frailty Scale (CFS) *1 (median, IQR)	5 (4-6)
STS score*2 (median, IQR)	6.2 (4.7-8.9)
Dementia on admission (n, %)	150 (53)

Outcomes

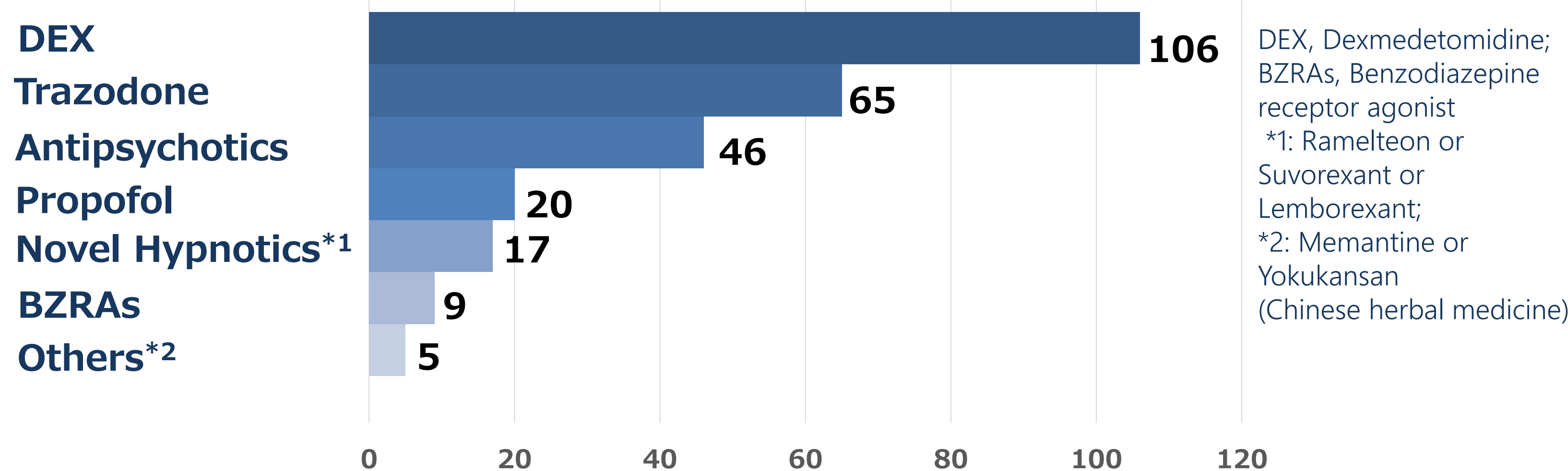
Delirium after TAVI (n, %)	120 (42)
Delirium requiring medication (n, %)	106 (37)
Patients prescribed DEX (n, %)	216 (76)
Death within 7 years after TAVI (n, %)	117 (41)

*1: CFS is a 9-point scale that quantifies frailty based on function in individual patients.

*2: The Society of Thoracic Surgeons (STS) score is a risk stratification model that is composed of up to 30 variables that predict short- and long-term mortality and morbidity after cardiac surgery.

Abbreviations: IQR, Interquartile Range, HR, Hazard ratios; CI, Confidential Interbal; CFS, Clinical Frailty Scale, STS score, The Society of Thoracic Surgeons score

Drugs Used for delirium after TAVI (among 120 delirium patients)

DEX, Dexmedetomidine; BZRAs, Benzodiazepine receptor agonist
*1: Ramelteon or Suvorexant or Lemborexant;
*2: Memantine or Yokukansan (Chinese herbal medicine)

Hazard ratios of all cause death from Cox proportional hazard models

Risk Factor	Crude HR	95% CI	Adjusted HR	95% CI
Delirium after TAVI	2.3	1.6-3.3	2.0	1.3-3.0
Age ≥ 90	1.1	0.7-1.7	0.7	0.4-1.0
CFS ≥ 5	3.3	2.1-5.2	2.7	1.6-4.5
STS Score ≥ 8	1.4	0.98-2.1	1.2	0.8-1.9
Dementia	2.9	2.0-4.3	2.0	1.3-3.1
Operation Time > 120 min	0.7	0.5-1.2	0.8	0.5-1.3
Use of DEX	0.8	0.5-1.3	0.6	0.4-0.9

This model included presence of delirium, age (≥ 90), CFS (≥ 5), STS Score (≥ 8), presence of dementia, operation time (≥ 120 min), use of DEX.

Discussion & Conclusions

In this study, DEX was widely used in patients undergoing TAVI with or without delirium, and the majority of delirium after TAVI was treated with DEX alone or DEX plus a non-antipsychotic psychotropic drug. The impact of DEX use on favorable life outcomes after TAVI may be due to the fact that DEX use reduced the use of psychotropic medications that have a high risk of causing a variety of ADEs.

Reference

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This study was approved by the institutional review board of the authors' institute, and there are no conflict of Interest in this study.

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