News Release

Successful development of an accurate prognostic model for cardiogenic shock the “J-PVAD risk score”

Key Points

- Cardiogenic shock is a condition with a high mortality rate, often requiring mechanical circulatory support.
- The Impella, a percutaneous mechanical circulatory support, was recently introduced as a new therapeutic option for cardiogenic shock and has already become widely used in clinical practice.
- We have developed an accurate risk prediction model (J-PVAD risk score) for cardiogenic shock requiring Impella support.

Summary

A research group consisting of Dr. Toru Kondo, Assistant Professor of Cardiology at Nagoya University Graduate School of Medicine, Professor Toyoaki Murohara, and Professor Masato Mutsuga of the Department of Cardiac Surgery has successfully developed an accurate risk prediction model (J-PVAD risk score) for cardiogenic shock requiring Impella.

Mechanical circulatory supports are often required for the management of cardiogenic shock. Cardiogenic shock is a condition with a high mortality rate, particularly when mechanical circulatory support is required, with in-hospital mortality exceeding 30%. The Impella device has recently been introduced as a new therapeutic option for cardiogenic shock and has already become widely used in clinical practice. A recent randomized control trial reported that the use of Impella, in addition to standard treatments, improved outcomes, suggesting that its use is likely to become even more widespread in the future.

Accurate risk prediction is essential in determining the treatment strategy for cardiogenic shock. However, until now, there has not been an accurate risk prediction model specifically for cardiogenic shock requiring Impella. We successfully developed the new risk prediction model using data from the J-PVAD registry, a national registry that collected all cases with Impella. The risk prediction model is composed of measures used in daily clinical practice, making it widely applicable in clinical settings.

This research is expected to enable more appropriate delivery of Impella-based treatment to patients with cardiogenic shock.

The results of this study were published in the European Journal of Heart Failure on September 19, 2024.

Research Background

Mechanical circulatory supports are often required for the management of cardiogenic shock. Cardiogenic shock is a condition with a high mortality rate, particularly when mechanical circulatory support is required, with in-hospital mortality exceeding 30%. The Impella device has recently been introduced as a new therapeutic option for cardiogenic shock and has already become widely used in clinical practice. A recent randomized control trial reported that the use of Impella, in addition to standard treatments, improved outcomes, suggesting that its use is likely to become even more widespread in the future.

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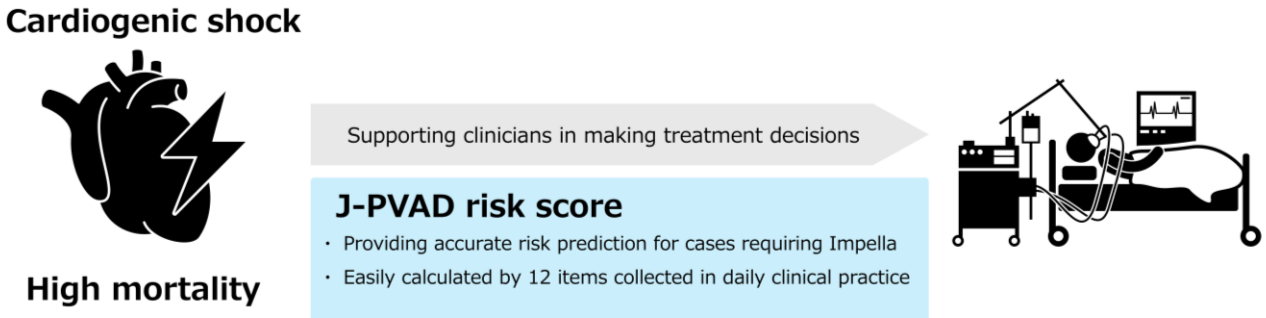
Research Results

We successfully developed the new risk prediction model using data from the J-PVAD registry, a national registry that collected all cases with Impella. The risk prediction model is composed of measures used in daily clinical practice, making it widely applicable in clinical settings.



J-PVAD risk score components:
Age, sex, body mass index, fulminant myocarditis, cardiac arrest in hospital, VA-ECMO use, mean arterial pressure, lactate, LDH, total bilirubin, creatinine, albumin

J-PVAD risk score	Predicted in-hospital mortality	J-PVAD risk score	Predicted in-hospital mortality
- 7	- 19%	21 - 23	49 - 54%
8 - 11	21 - 26%	24 - 26	57 - 62%
12 - 14	28 - 33%	27 - 30	64 - 71%
15 - 17	35 - 40%	31 - 35	73 - 80%
18 - 20	42 - 47%	36 -	81%-

Age 0-11 points, sex 0-3 points, body mass index 0-9 points, fulminant myocarditis -7-0 points, cardiac arrest in hospital 0-6 points , VA-ECMO use 0-6points, mean arterial pressure -5-0 points, lactate 0-4 points , LDH 0-9 points, total bilirubin 0-4 points, creatinine 0-9 points, albumin -6-0 points.

Research Summary and Future Perspective

When treating patients with cardiogenic shock requiring Impella support, the use of the J-PVAD risk score helps clinicians in their decision-making. We will continue efforts to raise awareness and promote the widespread use of the J-PVAD risk score.

Publication

Journal：European Journal of Heart Failure
Title：Predicting survival after Impella implantation in patients with cardiogenic shock: J-PVAD risk score

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