

Topic: Patient Safety & Quality Improvement**Utilizing Quality Control Circle as Quality Control Improvement Method for Reducing the Emergency Treatment Time for Patients with STEMI**Yu-Chi Yu*¹, Ting-Yi Wang¹, Ting-Ying Wu¹, Po-Han Wu¹, Yu-Wen Shih¹, Sheng-Han Lin²¹Department of Nursing, En Chu Kong Hospital, New Taipei City, Taiwan²Department of Medicine, En Chu Kong Hospital, New Taipei City, Taiwan**Introduction**

The American Heart Association recommends percutaneous coronary intervention (PCI) as the preferred treatment for ST-elevation myocardial infarction (STEMI), which must be completed within 90 minutes of reaching the cardiac catheterization lab to reduce patient mortality risk. The study utilized quality control circle (QCC) as a quality control improvement method to shorten the emergency room (ER) treatment time for patients with STEMI.

Methods

This study was conducted at a teaching hospital in Taiwan using a retrospective event study method. Data were collected from January 1, 2021, to May 31, 2021 and statistically analyzed. Out of 19 patients diagnosed with acute myocardial infarction (AMI) in the emergency room who underwent PCI, only 7 (36.8%) met the target door-to-balloon (D to B) time of 90 minutes. This was below the 60% coronary artery disease evaluation benchmark. Detailed record-keeping was used for current state analyses to identify the causes of problems and to develop intervention strategies for improvement. Current state analyses of the 12 patients who did not meet the target time revealed: a) The time from triage classification to electrocardiogram (ECG) examination averaged 12.9 minutes (21%), primarily due to the lack of a fixed location for conducting ECGs and the emergency personnel's inability to immediately identify myocardial infarction cases. b) The time from ECG interpretation to consultation with a cardiologist was 13 minutes (21%). c) The main reasons for the 11-minute (18%) duration from catheterization lab preparation to obtaining family consent were identified. Starting from January 1, 2022, continuous quality improvement (CQI) processes were implemented along with QCC, followed by an evaluation of the effectiveness of these interventions.

Results

The results showed that applying CQI processes and QCC effectively reduced the ER stay time for patients with STEMI. From January 1, 2020, to March 25, 2022, the rate of patients with AMI reaching the cardiac catheterization lab within the target time improved from 36.8% preintervention to 83.0% postintervention. Regarding patient treatment, the time from: a) triage classification to ECG examination decreased from 12.9 minutes to 5 minutes; b) ECG interpretation to cardiologist consultation decreased from 13 minutes to 10 minutes; and c) catheterization lab preparation to obtaining family consent decreased from 11 minutes to 7 minutes. The overall treatment time for patients with myocardial infarction was reduced from 62.2 minutes to 45 minutes, achieving the objective of this study.

Conclusion

Performing an ECG within 10 minutes of a patient's arrival, early interpretation by ER physicians and consultation with cardiologists, streamlining catheterization lab preparation and revising the standard operating procedures for myocardial infarction, and creating easy-to-understand educational materials for patients' families aided in shortening the time for each process. These measures contributed to achieving the objective of increasing the rate of STEMI patients reaching the catheterization lab within the target time. Further optimization of the treatment process through cross-departmental discussions is suggested for atypical cases to achieve continuous improvement to care quality.

References:

Li, Y. H., Lee, C. H., Huang, W. C., Wang, Y. C., Su, C. H., Sun-g, P. H., Chien, S. C., & Hwang, J. J. (2020). 2020 Focused Update of the 2012 Guidelines of the Taiwan Society of Cardiology for the Management of ST-Segment Elevation Myocardial Infarction. *Acta Cardiologica Sinica*, 36(4), 285-307.

