

Abstract

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Effectiveness of Early Warning Score for Predicting the Risk of In-Hospital Cardiac Arrest in Japan. –A Pilot Study-

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Objectives:

Early warning score (EWS) is widely used to prevent in-hospital cardiac arrest (IHCA). Although monitoring and risk stratification with EWS is important strategy for fostering safety culture, the validation of each EWS is not well known in Japan.

Methods:

We analyzed IHCA cases in single Japanese university hospital retrospectively. Cases were collected from September 2017 to July 2018. National Early Warning Score (NEWS) was calculated in several points before IHCA. Quick SOFA (qSOFA), SIRS, and the lactate level were reviewed at the same points. Sensitivity of each score was compared with Pearson's chi-square test.

Results:

55 cases were registered during the study period. Common reasons of IHCA were sepsis (27%) and fatal arrhythmia (20%). Positive cases with NEWS(≥ 7 points) were 30(55%), 24(44%), 20(36%), 18(33%), 15(27%), and 10(18%) at the point of 0-2, 2-4, 4-8, 8-12, 12-24, and 24-48 hours before IHCA. Positive cases with SIRS (≥ 2 points) were 32(58%), 29(53%), 25(45%), 25(45%), 22(40%), and 13(24%). qSOFA (≥ 2 points) were 22(40%), 19(35%), 16(29%), 15(27%), 13(24%), and 8(15%) retrospectively. NEWS with elevated lactate (≥ 2 mmol/L) had higher sensitivity which were 36(65%) at 0-2 hours before IHCA. There was no statistical difference in sensitivity for IHCA between 4 scoring systems. In the sepsis group, the positive rate of NEWS had tendency of higher sensitivity compared to arrhythmia group at 0-2 hours before IHCA (62% vs. 27%, $P=0.054$).

Conclusions:

NEWS was positive only in half of cases before IHCA. Effectiveness of NEWS in Japan was uncertain. Sensitivity of scores had changed widely depend on the reason of IHCA. Using several scoring system may help to prevent CA. New Japanese IHCA online registry had launched in 2017. To find effective EWS in Japan, IHCA registry across Asian countries is needed.