A retrospective review on Charlson Comorbidity Index as a predictor of return-of-spontaneous-circulation and survival-to-discharge of geriatric in-hospital cardiopulmonary resuscitation in a regional acute hospital in Hong Kong

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Method

Inclusion and exclusion criteria

This retrospective review included all adults aged 65 or above with in-hospital cardiac arrest and undergoing CPR in wards of Department of Medicine and Geriatrics (excluding Intensive Care Unit (ICU)) in United Christian Hospital (total bed 1,174 with 16 ICU beds) in Hong Kong from 1 January 2017 to 31 December 2018. It was approved by Kowloon Central and Kowloon East Cluster Research Ethics Committee (KC/KE-18-0283/ER-1). In patients with multiple resuscitation events, only the first in-hospital CPR was included. The primary outcome was ROSC; survival 24 hours after first CPR, on discharge, and at 1 year.

The exclusion criteria are as follows: patients with existing Do-Not-Attempt-Cardiopulmonary-Resuscitation (DNACPR) order, patients younger than 65 years old, out-of-hospital CPR in the index admission, CPR occurred in ICU / Emergency Department / Operating Theatre / wards other than medical wards.

Definitions

Cardiopulmonary arrest is defined as sudden cessation of spontaneous circulation and respiration leading to loss of consciousness and necessitating CPR. Sustained ROSC is defined as documented return of adequate circulation in the absence of ongoing chest compressions, and the duration should be of 20 minutes or above.[14] CCI was calculated according to the *International Classification of Disease, Tenth Revision, Clinical Modification* (ICD-10) coding.

Data collection and categorization

Eligible patients were identified by the CPR records (which contained the name and hospital number of each patient undergoing CPR) on the emergency trolley in each ward. The case notes and electronic patient records of these patients were reviewed.

Other covariates include smoking status, premorbid activity of daily living (ADL), premorbid mobility, the source of patient (home vs old aged home), tube feeding, any use of anticoagulation, post-operative status. Post-operative status was defined as any operations (including percutaneous coronary intervention (PCI)) within 30 days prior to cardiac arrest. Survival was measured at 24 hours, on hospital discharge, and at 1 year.

The details of CPR were collected according to Utstein style from resuscitation records in case notes. Shift of the day was defined according to nurses' schedule. Dayshift was defined as 7am to 9:30pm, and nightshift was defined as 9:30pm to 7am the next day.

Proportion of patient transferral to Intensive Care Unit/Coronary Care Unit after ROSC was recorded. Pre-discharge mobility, ADL and discharge destination in survived patients were also charted.

Statistical Method

SPSS version for Windows (version 25; IBM Corp, Armonk [NY], United States) software was used for statistical analysis. For the association between outcome (ROSC and survival-to-discharge) and categorical independent variables, Chi-squared test and Fisher's exact test were used. For continuous independent variables, student's t test was used for normally distributed data and Mann-Whitney U test was used for non-parametric data. CCI was categorized into three groups: 0-3, 4-6, ≥7. Chi-squared test was used to assess the differences between the above CCI groups. A two-tailed p value of <0.05 was considered statistically significant. Missing data were handled with SPSS's listwise deletion option.